



Standard Operating Procedure

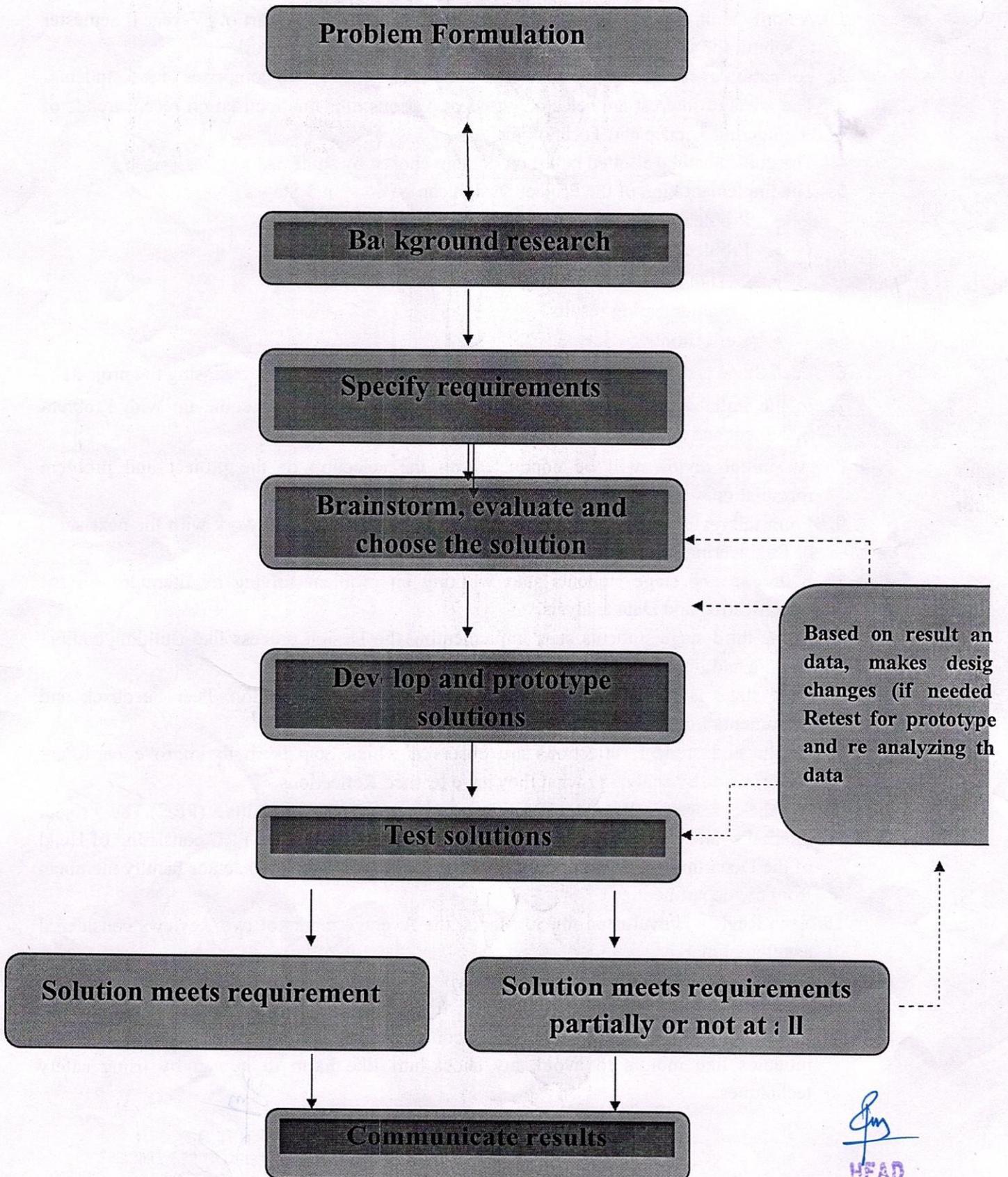
Process for allocation of Student projects:

1. A notification shall be issued to all final year students at the start of IV-year II semester to submit the area of interest for the selection of main Project Work.
2. Formation of students group should be done where each group comprises of 3-5 students.
3. The areas of interest are selected based on various domains focused on recent trends of engineering science and Technology.
4. The guide shall be allotted based on domain chosen by students.
5. The implementation of the Project Design can be done in 5 Stages
 - Problem formulation
 - Problem solving
 - Design/coding
 - Communicating results
 - Reflections
6. Each Stage is divided in to Sub-categories by creating rubrics for assessing the projects.
7. In the initial stage of Problem formulation students have to come up with Problem Statement and stakeholder opinions.
8. An initial review will be conducted on the selection of the project and problem formulation.
9. From the review considerations the groups start-up the Project work with the next stage of Engineering design process.
10. In the second stage students start working on problem solving by literature survey, Specification and Data analysis.
11. In the third stage students start implementing the Design process like Building/coding, Testing and Iteration.
12. Next stage is communication of results with Oral Presentation, Peer Feedback and Documentation.
13. At the end student reflections are observed which help them to improve on future performance by analyzing what they have learned Reflections
14. All these stages will be reviewed by Project Review Committee (PRC).The Project internal evaluation shall be done by conducting Reviews by the PRC consisting of Head of the Department, Project coordinator, concerned guide and two senior faculty members from the department.
15. Each Review is evaluated for 50 Marks, the Average marks of two Reviews considered as internal marks.
16. The projects are converted into prototype. Projects are extended with new ideas and pursued as a new proposal.
17. While designing the project safeties are considered in High voltage sources and rotatable modules like motors to avoid any shock/hurt like harm to human by using safety techniques.

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Projects Evaluation Framework





RUBRICS FOR PROJECTS EVALUATION

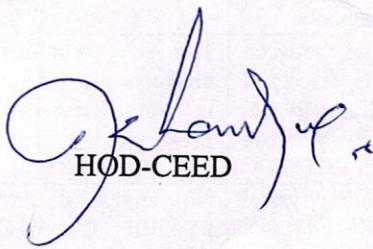
Stages	Criteria	Advanced (4)	Proficient (3)	Developing (2)	Novice (1)
PROBLEM FORMATION (8M)	Problem Statement (4M)	Complete understanding of the problem; the problem statement is well written.	Better understanding of the problem; the problem statement is clearly written.	Minimal understanding of the identified problem and domain knowledge is less.	No understanding of the problem; The problem statement is not provided or if provided, it may be unclear.
	Stakeholder Opinions (4M)	Customers and markets analyzed and project is guided by analysis	Customers and markets analyzed but project was not guided by analysis	Customers and markets identified, but analysis was not performed	Neither customers nor markets identified; no analysis performed
PROBLEM SOLVING (12M)	Background Research & Idea Generation (4M)	Background information on the problem includes narrative with references of general professional or research literature. The students are clear with purpose, scope and objectives of the identified problem and its domain.	Background information on the problem includes narrative with some references of general professional or research literature. The students are clear with purpose, scope and objectives of the identified problem and its domain.	Background information on the problem includes narrative but no references of general professional or research literature. Purpose and scope still need to be improved. Objectives look very vague.	Background information on the problem is not provided The purpose and scope of the work are relating to the statement problem statement.
	Specifications & Constraints (4M)	Describe in clear, unambiguous terms the functional requirements of the system. Provide a sufficient level of detail for designers to design a system satisfying these requirements and testers to verify that the system satisfies requirements.	Describe in clear, unambiguous terms the functional requirements of the system. Provide a sufficient level of detail for designers to design a system satisfying these requirements and testers to verify that the system satisfies requirements	Describe in clear, unambiguous terms the functional requirements of the system. Provide a sufficient level of detail for designers to design a system satisfying these requirements and testers to verify that the system satisfies requirements.	Very few functional requirements are identified and use cases are not written with descriptions.
	Data Analysis (4M)	The relationship between the variables is discussed and logically analyzed.	The relationship between the variables is discussed and logically analyzed, no further predictions are made.	The relationship between the variables is discussed but not logically analyzed, no further predictions are made.	The relationship between the variables is not discussed & Presented
DESIGN / CODING (12M)	Building / Coding (4M)	Analytical and/or physical models fully found the entire design	Analytical and/or physical models found most design subsystems	Analytical and/or physical models found on few design subsystems	No analytical and/or physical models developed of the design
	Testing (4M)	Testing and analysis plan used as an overarching guide	Testing and analysis plan present but only followed loosely	Testing and analysis plan present but not referenced	No testing plan or analysis plan has been generated
	Iterations (4M)	Students complete their project, having improved the design over time	Students undertake 1 or more iterations of their project, improving the design	Students attempt to make an iteration on the design of the project, but is unsuccessful in any improvement	Students do not attempt to iterate or make any changes on their initial


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& Technology

COMMUNICATING RESULTS (12M)		REFLECTIONS (6M)		
Oral Presentation (4M)	Well organized, Proper subject knowledge, usage of graphics, proper eye contact, and great Elocution.	Well organized, Proper subject knowledge, usage of graphics, proper eye contact, but speech is not clear	Well organized, Proper subject knowledge, no usage of graphics, no proper eye contact, but speech is not clear	Not well organized and unclear presentation
Peer Feedback (4M)	Great Quality of work, Team work is excellent, Focus on task is excellent.	Great Quality of work, Team work is good, Focus on task is poor	Great Quality of work, No Team work, Focus on task is poor	No interaction with peers in the above stages
Report Submission (4M)	Solution presented concisely with clarity and accuracy. Extensive supporting evidence on how the solution meets the task criteria.	Solution presented accurately. Some supporting evidence on how the solution meets the task criteria need to be improved	Solution presented with limited accuracy. Limited supporting evidence on how the solution meets the task criteria.	Not well organized and the guidelines are not followed
Use of Engineering Design Process (4M)	Make connections among all the stages of engineering design process to connect theory and real experiences. Well-articulated the impact of the process in developing skills	Make connections among all the stages of engineering design process to connect theory and real experiences. Articulation of the impact of the process in developing skills is not done	All the stages are not effectively utilized. Articulation of the impact of the process in developing skills is not done	No articulation of the self-involvement, no impact of Engineering design process on personal growth
Self-Improvement (2M)	Demonstrates through and penetrating understanding of key concepts, exhibits copious evidence of attainment of skills	Demonstrates a adequate understanding of key concepts, exhibits adequate evidence of attainment of skills	Demonstrates a partial understanding of key concepts, exhibits some evidence of attainment of skills	Demonstrates a little understanding of key concepts, exhibits minimal evidence of attainment the skills


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MINI PROJECTS EVALUATION

Mini project

2.2.3 Quality of Student Projects.

Process for allocation of Student projects:

1. A notification shall be issued to all III B.Tech–II semester students at the end of semester to apply for various industries for apprenticeship/Mini Project.
2. Formation of students group should be done where each group comprises of 3-5 students. (Make sure every batch has equal capabilities/standards)
3. The areas of interest are selected based on various domains focused on recent trends of engineering science and Technology.
4. Allocations of guides are done after the domains being selected by the batches.
5. The evaluation of the Mini Project can be done in 4 Stages
 - Proposal Evaluation
 - Mid-term Project Evaluation
 - End Semester Internal Project Evaluation
 - Report Evaluation
6. Each Stage is divided in to Sub-categories by creating rubrics for assessing the Mini projects.
7. In the initial stage of Project Synopsis / Proposal Evaluation, students have to come up stakeholder/Industry experts opinions and abstract (with proposed study).
8. From the review considerations the groups will continue their work or change the Project proposal and can continue their industry oriented work or internship.
9. A midterm evaluation will be conducted around 4th – 6th week on design methodology, work and team structure of the project.
10. From the review considerations the groups will work on further technical details and towards conclusion.
11. In the third stage around 11th – 13th week another review will be conducted to ensure the Incorporation of suggestion /modification given in previous review, Demonstration/ Presentation.
12. In the final stage report evaluation, description of concept and technical details along with conclusion with Oral Presentation and Peer Feedback
13. All these stages will be reviewed by Project Review Committee (PRC).The Project internal evaluation shall be done by conducting Reviews by the PRC.
14. The student is deemed to have failed, if he (i) does not submit a report on Industrial Oriented Mini Project/Summer Internship, or does not make a presentation of the same before the evaluation committee as per schedule, or (ii) does not present the seminar as required in the IV year I Semester, or (iii) secures less than 40% marks in Industrial Oriented Mini Project/Summer Internship and seminar evaluations.


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Stages	Criteria	Excellent	Good	Average	Unacceptable
Proposal Evaluation	Identification of Problem Domain and Detailed Analysis	Detailed and extensive explanation of the purpose and need of the project	Good explanation of the purpose and need of the project	Moderate explanation of the purpose and need of the project	Minimal explanation of the purpose and need of the project
	Study of the Existing Systems and Feasibility of Project Proposal	Detailed and extensive explanation of the specifications and the limitations of the existing systems	Collects a great deal of information and good study of the existing systems	Moderate study of the existing systems, collects some basic information	Minimal explanation of the specifications and the limitations of the existing systems; incomplete information
	Objectives and Methodology	All objectives of the proposed work are well defined; Steps to be followed to solve the defined problem are clearly specified	Good justification to the objectives; Methodology to be followed is specified but detailing is not done	Incomplete justification to the objectives proposed; Steps are mentioned but unclear;	Objectives of the proposed work are either not identified or not well defined; Incomplete and improper specification
Midterm Evaluation 1 & 2	Incorporation of Suggestions ,Design Methodology	Good selection of computing framework and appropriate design methodology and proper justification	Good selection of computing framework and design methodology not properly justified	inappropriate selection of computing framework and design methodology not defined properly	Design methodology not defined properly
	Work and Team Structure	Time frame properly specified and being followed. Appropriate distribution of project work	Time frame properly specified and being followed and distribution of project work is inappropriate	Time frame properly specified and not being followed and distribution of project work is Un-even	Time frame not properly specified in appropriate distribution of project work.
	Presentation	Presentations are appropriate and well arranged	Presentations are appropriate but not well arranged. Satisfactory Demonstration.	Presentations are appropriate but not Well arranged. average Demonstration.	Presentations are not appropriate and not well delivered
End Semester Internal Project Evaluation	Incorporation of Suggestions	Changes are made as per suggestions and new innovation added	Changes are made as per suggestions and new innovation added good justification	Changes are made as per suggestions	Suggestions are not incorporated
	Demonstration	Defined objectives are achieved. Each module working well and properly demonstrated all modules	Defined objectives are achieved. Each module working well and properly demonstrated integration of all	Defined objectives are achieved. Each module working well in isolation and properly demonstrated.	Defined objectives are not achieved. Modules not in proper working.


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Report Evaluation	Self Motivation and Determination	Approaches the project with self- motivation and follows it through to completion	Completes the project but sometimes lacks motivation.	Lacks self motivation but determination	Lacks self motivation and determination
	Working within a Team	Collaborates and communicates in a group situation and integrates the views of others	Exchange some ideas but required guidance to collaborate with group	Make Little attempt to collaborate with team	Make no attempt to collaborate with team
	Technical Knowledge and Awareness related to the Project	Extensive knowledge related to the project	Moderate knowledge related to the project	fair knowledge related to the project	Have no knowledge related to the project
	Regularity	Reports to the guide regularly and consistent in work	Do not reports to the guide regularly but consistent in work	Reports to the guide regularly but inconsistent in work	Do not reports to the guide regularly and inconsistent in work



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Project Based Assignments

Process for allocation of Student projects:

1. A notification shall be issued to all students before the beginning of every semester to identify the problem statement either related to their field or multidisciplinary and submit the abstract in week 1.
2. Formation of students group should be done where each group comprises of 3-5 students. (Make sure every batch has equal capabilities/standards)
3. The areas of interest are selected based on various domains focused on recent trends of engineering science and Technology.
4. Transparency should be maintained while allotting guide.
5. The implementation of the PBA should be done as per below stages
 - *Problem Definition*
 - *Conceptual generation*
 - *Preliminary Design*
 - *Detailed Design*
 - *Design Communication*
6. Each Stage is divided in to Sub-categories by creating rubrics for assessing the PBA projects.
7. In the initial stage of ProjectEvaluationstudentshave to come up with **Problem Definition**which includes-Problem Statements and stakeholder opinions which can be done by using affinity diagrams.
8. From the review considerations the groups will continue their work through **Conceptual Generation** which consists of exploring the solution space. It includes Background search, brainstorming & sketching ideas and Concept development & Screening.
9. After the generation of multiple valid concept alternatives and assessing it the students can go ahead for the Design stage which Includes **Preliminary and Detailed design**. Both the design stages has several sub stages of design as Building/coding, testing, rendering, developing physical prototype/application, creating or making a final design (optional for PBA).
10. From the review considerations the groupswill work on further technical details and towards conclusion.
11. In the later stage another review will be conducted to ensure the Incorporation of suggestion /modification given in previous review, Demonstration/ Presentation.
12. In the final stage report evaluation ,description of concept and technical details along with conclusion with Oral Presentation in **Design Communication** stage
13. All these stages will be reviewed by Project Review Committee (PRC).The Project internal evaluation shall be done by conducting Reviews by the PRC consisting of Head of the Department, PBA projectcoordinator, concerned guide and two senior faculty members from thedepartment.
14. The projects are converted into prototype. Projects are extended with new ideas and pursued as a newproposal.


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RUBRICS FOR PROJECTS EVALUATION

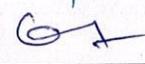
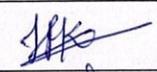
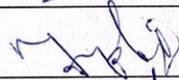
Stages	Criteria	Advanced (4)	Proficient (3)	Developing (2)	Novice (1)
PROBLEM DEFINITION (5M)	Problem Statement (3M)	Complete understanding of the problem; the problem statement is well written.	Better understanding of the problem; the problem statement is clearly written.	Minimal understanding of the identified problem and domain knowledge is less.	No understanding of the problem; The problem statement is not provided or if provided, it may be unclear.
	Stakeholder Opinions (2M)	Customers and markets analyzed and project is guided by analysis	Customers and markets analyzed but project was not guided by analysis	Customers and markets identified, but analysis was not performed	Neither customers nor markets identified; no analysis performed
CONCEPTUAL GENERATION (5M)	Background Search (1M)	Background information on the problem includes narrative with references of general professional or research literature. The students are clear with purpose, scope and objectives of the identified problem and its domain.	Background information on the problem includes narrative with some references of general professional or research literature. The students are clear with purpose, scope and objectives of the identified problem and its domain.	Background information on the problem includes narrative but no references of general professional or research literature. Purpose and scope still need to be improved. Objective s looks very vague.	Background information on the problem is not provided the purpose and scope of the work are relating to the statement problem statement.
	Brainstorming & Sketching Ideas (2M)	Considers additional features to improve device Customers and design requirements shows progression/evolution of designs through sketches provides realistic drawings with key technical information	Relates existing ideas to create new concept effectively uses screening charts to compare, eliminate, or redevelop ideas Creates relationships between requirements and features sketched	Provides descriptions to sketches relates required functions to needs Presents freehand sketches with a degree of neatness and comprehension of requirements	-No or unsatisfactory description -No Sketches or sketches doesn't matches the problem statements
	Concept Development and Screening (2M)	Considers functional flexibility and failure modes Considers complexity of parts and assembly with respect to manufacturability and function Uses House of Quality to generate engineering specifications	Considers appearance, ease of use and assembly Provides detailed information on scope of designs somewhat understands use of House of Quality	Derives design with adequate creativity using existing concepts	
PRELIMINARY DESIGN (5M)	Building / Coding (3M)	Analytical and/or physical models fully found the entire design	Analytical and/or physical models found most design subsystems	Analytical and/or physical models found on few design subsystems	No analytical and/or physical models developed of the design
	Testing (2M)	Testing and analysis plan used as an overarching guide	Testing and analysis plan present but only followed loosely	Testing and analysis plan present but not referenced	No testing plan or analysis plan has been generated

DETAILED DESIGN (5M)	Renderings of Final Design (2M)	Provides realistic drawing with color and material rendering develops comprehensive functional drawings	Shows key features and functions displays appropriate view for most 3-D details to show	Shows adequate 3-D renderings of components	No Rendering of the design
	Physical Prototype/Application (3M)	Prototype meets all constraints. Prototype functionality exceeds expectations of detailed final design. Prototype effectively communicates the form of the detailed final design with professional level quality.	Prototype meets all constraints. Prototype functionality aligns clearly with detailed final design. Prototype effectively communicates the form of the detailed final design, and exhibits quality/craftsmanship.	Prototype meets most but not all constraints. Prototype functionality approaches expectations of detailed final design. Prototype roughly communicates the form of the detailed final design.	Prototype meets few constraints. Prototype is insufficient to demonstrate basic functionality of detailed final design. Prototype does not communicate the basic form of the detailed final design.
	Creating or Making It (No Credits-Best Projects can be selected from here)	Finished solution (product) exceeds specifications.	Finished solution (product) meets specifications.	Finished solution (product) fails to meet specifications.	Not Finished
DESIGN COMMUNICATION (5M)	Oral Presentation (2M)	Well organized, Proper subject knowledge, usage of graphics, proper eye contact, and great Elocution.	Well organized, Proper subject knowledge, usage of graphics, proper eye contact, but speech is not clear	Well organized, Proper subject knowledge, no usage of graphics, no proper eye contact, but speech is not clear	Not well organized and unclear presentation
	Report Submission (3M)	Solution presented concisely with clarity and accuracy. Extensive supporting evidence on how the solution meets the task criteria.	Solution presented accurately. Some supporting evidence on how the solution meets the task criteria need to be improved	Solution presented with limited accuracy: Limited supporting evidence on how the solution meets the task criteria.	Not well organized and the guidelines are not followed


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Academic Year: 2020-21

Project Review Committee (PRC)

S. No	Name of faculty	Designation	Position	Signature
1.	Dr H.S. Wankhede	HOD	Chairman	
2.	Mr. K Rama Krishna Reddy	Assistant professor	Coordinator	
3	Mr.Raghu Kumar	Assistant professor	Member	
4.	Ms.B.N.Jyothi	Assistant professor	Member	
5..	Bimal Kumar <i>Dr. Srinivas Jheda</i>	Associate professor	Member	 <i>Jain</i>


Coordinator


Chairman
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Document Softcopy Location:

Functions and responsibilities of Project Review Committee (PRC):

1. Orientation on specialization to the students
2. Collection of data on student's interest specialization
3. Collection of faculty data for various specializations
4. Preparation of data base for projects by reviewing the reference papers
5. Identification of projects titles
6. Allotment of project guides
7. Conducting training sessions to the students
8. Preparation of project seminar schedule
9. Preparation of attendance sheets and evaluation sheets for projects seminars
10. Preparation and publishing of research papers based on project to the international journals/conferences.
11. Information to the students on projects seminars and university notifications on project work
12. Conducting the project seminar as per the schedule and Display of marks after the evaluation
13. Collection of manuscripts and final version of projects
14. Conducting plagiarism test
15. Submission of list of projects to the department
16. Submission of hardbound copies to the department/institution/library/students
17. Preparation conduction of project external viva-voce within the campus

Department of Computer Science & Engineering

Document Softcopy Location:

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF BEST MAJOR PROJECTS

Class: IV B.TECH, B Section

A.Y: 2020-2021

SL. NO	ROLL NO.	NAME OF THE STUDENT	NAME OF THE INTERNAL GUIDE	TITLE OF THE PROJECT
1	17QM1A0558	MANGALAGIRI KRISHNA SAI	L. RAGHUKUMAR	SMART ATTENDENCE SYSTEM USING PYTHON
	17QM1A0560	MAREGOUNI PRIYANKA		
	17QM1A05A6	MEKA LAVYASRI		
	17QM1A0598	NETHULA RAHUL YADAV		
2	17L01A0509	T.NAGA SRUTHI	K. RAMAKRISHNA REDDY	DIGITAL BUS CARD
	17L01A0507	N.AKHILA		
	17M51A0538	MOHAMMAD UBAID MOHINDELIN		
	17M51A0555	ROBIN SING		
3	17QM1A0588	TROOPBAZAR AKHILA	SARASWATHI DEVI	EFFICIENT CHATBOT FOR KGR CET
	17QM1A0581	SHAIK ALTAF HUSSAIN		
	17QM1A0556	M MANOJ KUMAR		
	17QM1A05A2	TIPPARAMONI BHUVANESHWAR		


8/7/2021
PROJECT COORDINATOR


8/7/2021
PRC COORDINATOR


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

LIST OF BEST MAJOR PROJECTS

Class: IV B.TECH, A Section

A.Y: 2020-2021

SL. NO	ROLL NO.	NAME OF THE STUDENT	NAME OF THE INTERNAL GUIDE	TITLE OF THE PROJECT
1	17QM1A0503	A NAGA SAI POOJITHA	Dr. B. HARI KRISHNA	BLOOD DONATION MANAGEMENT THROUGH DATA ANALYSIS BY USING CLASSIFICATION TECHNIQUE
	17QM1A0510	BALREDDY MADHURI		
	17QM1A0555	LAXMI VENKATA LAHARI N		
	17QM1A0518	CHINTAL VIJAY KUMAR		
2	17QM1A0528	G S VAISHNAVI	N. SRINIVAS	IOT BASED MONITORING PH LEVELS IN SHRIMP PONDS FOR BETTER NUTRIENT MANAGEMENT
	17QM1A0538	GUDGUNTLA NAVEEN KUMAR		
	17QM1A0527	DYAVARASHETTY GOUTHAM		
	17QM1A0525	DANTURI HARSHITHA		
3	17QM1A0502	A POOJA SHRENI	P. NARESH KUMAR	ONLINE OPD APPOINTMENT AND HOSPITAL INFORMATION SYSTEM
	17QM1A0508	AVULA NEHA		
	17QM1A0521	CHITYALA MAHESHWARI		
	17QM1A0550	KOTLA PRANEETH REDDY		

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PROJECT COORDINATOR

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PRC COORDINATOR

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MAJOR PROJECTS

Academic Year: 2019-2020

#	HT NO	Name of the Student	Name of the project
1	16QM1A0566	P SAI SIRISHA	ORYZA
2	16QM1A05A3	S AJAY KUMAR	
3	167B1A0515	K VANI	



PROJECT COORDINATOR



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CHILKOTI, S. RAJAMPET, K. R. DIST. T.S.



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MAJOR PROJECTS

Academic Year: 2018-2019

#	HT NO	Name of the Student	Name of the project
1	15QM1A0507	B JHANSI LAXMI	DUAL SERVER PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH FOR SECURED CLOUD STORAGE
2	15QM1A0518	D SWETHA	
3	15QM1A0524	G PRIYANKA	
4	15QM1A0534	K SADHANA	
1	15QM1A0525	G SURAJ KUMAR	NEAREST KEYWORD SET SEARCH IN MULTI-DIMENSIONAL DATA SETS
2	15QM1A0526	G SPANDANA	
3	15QM1A0536	K AVANI PATEL	
4	15QM1A0554	R SEVITHA	


PROJECT COORDINATOR


HOD, CSE


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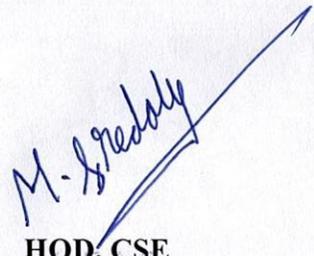
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MAJOR PROJECTS

Academic Year: **2017-2018**

#	HT NO	Name of the Student	Name of the project
1	14QM1A0536	KANNEDARI GOPI KRISHNA	NESSUKA
2	14QM1A0553	KRISHNA MOORTHY	
3	14QM1A0526	GANJI SRIKANTH	
4	14QM1A0502	AKULA SAI MANISH CHANDRA	


PROJECT COORDINATOR


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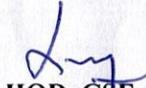
IV CSE A, Major Projects (2020-2021)

Batch NO.	Roll No.	Name of the student	TITTLE OF THE PROJECT	NAME OF THE INTERNAL GUIDE	Problem Formatio n (4M)	Problem Solving (6M)	Design / Coding (6M)	Communi cating Results (6M)	Documen tation (3M)	Total Marks (25)
1	17QM1A0501	A BHANU PRIYA	Online Portal for ordering food in local areas	Saraswathi devi	3	5	5	6	3	22
	17QM1A0505	AKKALADEVI SANDEEP			4	5	5	5	3	22
	17QM1A0519	CHIRAG KEERTHI SREE			3	5	4	5	3	20
	17QM1A0535	GEDELA SRUJANA			3	5	5	5	3	21
2	17QM1A0502	A POOJA SHRENI	Online OPD appointment and Hospital Information System	P. Naresh Kumar	3	6	6	5	3	23
	17QM1A0508	AVULA NEHA			3	5	5	5	3	21
	17QM1A0521	CHITYALA MAHESHWARI			3	5	5	4	3	20
	17QM1A0550	KOTLA PRANEETH REDDY			4	5	4	4	3	20
3	17QM1A0503	A NAGA SAI POOJITHA	Blood Donation Management through data analysis by using classification technique	Dr. B. Hari krishna	3	6	5	6	3	23
	17QM1A0510	BALREDDY MADHURI			4	5	5	5	3	22
	17QM1A0555	LAXMI VENKATA LAHARI N			3	5	5	4	3	20
	17QM1A0518	CHINTAL VIJAY KUMAR			3	5	4	5	3	20
4	17QM1A0504	AJIT	Cyberbullying Detection on Social Media Using ML	R. Hima sgarika	3	5	5	4	3	20
	17QM1A0514	BIRADAR JAISH			3	4	5	5	3	20
	17QM1A0554	LALCHAND GURJAR			3	4	4	5	3	19
	17QM1A0506	A SHIVA BHARGHAV			3	4	5	4	3	19
5	17QM1A0513	BELLAMGARI PRANAVI	Analysis and prediction of cardio vascular disease	L. Raghu kumar	4	6	6	5	3	24
	17QM1A0515	SAI KIRAN REDDY B			4	5	5	5	3	22
	17QM1A0507	A SRI CHAITHANYA KUMAR			3	5	5	4	3	20
	17QM1A0516	CHANDA VARUN RAJ			3	5	5	5	3	21
6	17QM1A0520	CHIRUMAMILLA RAJA KARTHIK	Facial recognition based Attendance system	R. Sowjanya	3	6	5	4	3	21
	17QM1A0522	DASARI KEERTHI			3	5	6	5	3	22
	17QM1A0509	BADDAM SRUJAN REDDY			3	5	5	4	3	20
	17QM1A0533	YAMINI GOUD			2	5	5	5	3	20
7	17QM1A0547	KALWA SAI CHARAN	ACCURATE AND ROBUST VIDEOS ALIENCY DETECTION VIA SELF-PACED DIFFUSION	Dr. J. Srinivas	3	5	5	5	3	21
	17QM1A0523	D VIVEK			3	6	5	5	3	22
	17QM1A0539	GHANAPURAM SHEKAR REDD			4	5	5	4	3	21

8	17QM1A0551	KAVYA DYASAPALLY	Analysing and detecting money laundering accounts in online social networks	B.N. Jyothi	3	5	5	5	3	21
	17QM1A0526	DUPPEKAR VYSHNAVI			3	5	5	5	3	21
	17QM1A0512	BATHULA PAVAN KUMAR GOUD			3	5	5	4	3	20
	17QM1A0540	GUNDAVENI SAI CHARAN			4	5	4	4	3	20
9	17QM1A0536	GOURAVARAPU JAYAVENKATA SAI GOPI ARAVIND	Disease Reporting System for Predicting the disease by using classification techniques.	Y.Venkat Rao	3	5	5	5	3	21
	17QM1A0529	G SAI PRADHIKSHA			3	5	4	5	3	20
	17QM1A0532	SUPRIYA REDDY			3	5	5	5	3	21
	17QM1A0511	BANNGAR NABI			3	5	5	4	3	20
10	17QM1A0528	G S VAISHNAVI	IOT BASED MONITORING PH LEVELS IN SHRIMP PONDS FOR BETTER NUTRIENT MANAGEMENT	N. Srinivas	4	5	5	5	3	22
	17QM1A0538	GUDGUNTALA NAVEEN KUMAR			3	5	5	5	3	21
	17QM1A0527	DYAVARASHETTY GOUTHAM			3	4	5	5	3	20
	17QM1A0525	DANTURI HARSHITHA			2	5	5	5	3	20
11	17QM1A0544	KADARI ROOPESH	Crime Detection using Face Recognition (Machine Learning and Artificial intelligence solutions to Police functions)	Dr. H.S Wankhade	4	6	5	6	3	24
	17QM1A0545	VASAVI KADARI			4	6	5	4	3	22
	17QM1A0537	GOUSE M D			3	4	4	5	3	19
12	17QM1A0541	JALAJA REDDY	IOT based monitoring system for Irrigation.	Dr. K Sangeetha	4	5	5	4	3	21
	17QM1A0534	GANGAVARAPU SHANYA PSALMS			3	5	6	5	3	22
	17QM1A0530	GADDAM SHIRISHA			3	5	5	4	3	20
13	17QM1A0549	KARSAI SRISAILAM YADAV	ACMS(Agriculture Management System)	K Ramakrishna Reddy	4	5	5	5	3	22
	17QM1A0546	KALPAGURI VINAY KUMAR GUPTA			3	5	4	5	3	20
	17QM1A0542	HRITHIK SINGH			3	4	4	5	3	19


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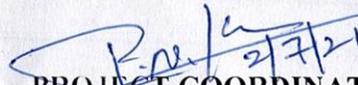

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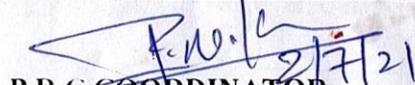
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KG REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHILKURU, MCHM, R.R. DIST. T.S.

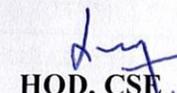
IV CSE B, Major Projects (2020-2021)

BATCH No	Roll No.	NAME OF THE STUDENT	TITTLE OF THE PROJECT	NAME OF THE INTERNAL GUIDE	Problem Formation (4M)	Problem Solving (6M)	Design / Coding (6M)	Communica ting Results (6M)	Docume ntation (3M)	Total Marks (25)
1	17H11A0505	FARHEEN	Online Blood Donation Management Through Classification of using Data Analysis	P. Ashwini Goud	3	5	6	6	3	23
	17611A0504	DEEKSHA			4	5	5	5	3	22
	17QM1A0574	RAMESHWARAM SATISH KUMAR			4	5	5	5	3	22
	17QM1A05A4	ALLI SIRISHA			3	5	4	5	3	20
2	17QM1A0557	MAMIDI MADHU	Face Detection Based Attendance System	Dr J Srinivas	3	5	6	5	3	22
	17H11A0532	JAWAD			3	5	5	5	3	21
	17611A0503	SASHIKALA			3	5	5	5	3	21
	17611A0501	B.TEENASRI			4	5	4	4	3	20
3	17QM1A0558	MANGALAGIRI KRISHNA SAI	SMART ATTENDANCE SYSTEM USING PYTHON	L.Raghukumar	4	6	5	6	3	24
	17QM1A0560	MAREGOUNI PRIYANKA			4	5	5	6	3	23
	17QM1A05A6	MEKA LAVYASRI			3	5	5	4	3	20
	17QM1A0598	NETHULA RAHUL YADAV			4	5	5	5	3	22
4	17QM1A0559	MARAVAPALLY MAHARSHI	VOICE BOT FOR COMPLAINT REGISTRATION	N Srinivas	3	6	6	5	3	23
	17QM1A0567	MOHD JAMEEL AHMED			4	4	5	5	3	21
	17QM1A0587	SAI VINAY			4	5	5	5	3	22
	17QM1A0575	RENUKUNTLA RAHUL			4	5	6	5	3	23
5	17QM1A0565	MOHAMMED SAIFUDDIN	Using NFT's to create unique identification systems	R.Sowjanya	4	5	6	5	3	23
	17QM1A0572	PUNA PRACHI			4	5	5	5	3	22
	17QM1A0573	R PRAKASH REDDY			3	5	5	5	3	21
6	17QM1A0579	SAPPATI VASAVI	Sapien Enumerator	Shelly Sinha	3	5	5	5	3	21
	17QM1A0576	S SOUDAMINI			3	5	5	4	3	20
	17QM1A0570	PERMISHETTY YESHWANTH			4	5	6	5	3	23
	17QM1A0593	VISHAL GUPTA			4	5	6	4	3	22
7	17QM1A0582	SHANKURI HARIKA	Fake Account Detection using Machine Learning and Data Science	Dr. L Venkateswara Reddy	2	5	5	5	3	20
	17QM1A0569	P ABHILASH REDDY			3	6	5	6	3	23
	17QM1A0563	MIR FURQAAN ALI			4	6	5	5	3	23
	17QM1A05B0	D AMARDEEP REDDY			4	5	5	4	3	21

8	17QM1A0588	TROOPBAZAR AKHILA	Efficient ChatBot for KGR CET	Saraswathi Devi	4	5	5	5	3	22
	17QM1A0581	SHAIK ALTAF HUSSAIN			3	5	5	5	3	21
	17QM1A0556	M MANOJ KUMAR			3	5	5	6	3	22
	17QM1A05A2	TIPPARAMONI BHUVANESHWAR			4	5	5	4	3	21
9	17QM1A0589	V PAVANI	A Hybrid Intelligent System Framework for the Prediction of Heart Disease Using Machine	Dr B.Harikrishna	4	5	5	5	3	22
	17QM1A0590	V V SAI TEJASWI			3	5	4	5	3	20
	17HI1A0527	FAIZAN			3	6	5	5	3	22
	17QM1A0586	TALATOTI CHARLES			3	5	5	5	3	21
10	17QM1A0591	VALLABANENI SAI NIKITHA	"Traffic Prediction for Intelligent Transportantion System"	A.Anusha	4	5	5	5	3	22
	17QM1A0596	YEMPATHI AASHRITHA			3	5	5	5	3	21
	16601A0528	SREELAYA G			3	5	5	5	3	21
	17QM1A0585	SULGE NIKITHA			3	5	5	5	3	21
11	17QM1A0594	VUNDYALA SREENIDHI REDDY	BRAIN TUMOUR DETECTION USING CONVOLUTIONAL NEURAL NETWORK	B.N.Jyothi	3	5	5	4	3	20
	17QM1A0597	YOGESH SINGH			4	4	5	4	3	20
	17QM1A0577	SAMA VANI			4	5	5	6	3	23
	17QM1A0583	SHUBAM KUMAR			3	5	5	4	3	20
12	17QM1A0595	YELETI PRANITHA	ONLINE CRIME REPORTING SYSTEM	P. Naresh Kumar	3	5	4	5	3	20
	18QM5A0501	KASOJU BAVANA			3	5	5	4	3	20
	17QM1A0568	MOURYA KUNAL ASHOK KUMAR			4	5	5	5	3	22
	17QM1A0580	SARIKONDA NAVEEN REDD			4	5	5	5	3	22
13	17M51A0517	Farhin Pavin	SKIN DISEASE DETECTION	Dr. K Sangeetha	3	5	5	5	3	21
	17M51A0557	Samsunnesha Khateen			4	5	4	4	3	20
	17QM1A0566	MOHAMMED SHAHED			4	4	4	5	3	20
	17QM1A05A3	SHETTI ANUSHA			3	5	5	5	3	21
14	17M51A0536	M.A.AzeemKhan	Face Recognition based Attendance Management System using Raspberry PI	B Swathi	3	5	5	5	3	21
	17M51A0566	Syed Moin Uddin			3	5	5	4	3	20
	17L01A0501	A.Uma			3	4	5	5	3	20
	17M51A0503	Ansar Fatima			3	5	5	4	3	20
15	17L01A0509	T.Naga sruthi	Digital Bus Card	K. RamaKrishna Reddy	4	5	5	6	3	23
	17L01A0507	N.Akhila			3	6	5	6	3	23
	17M51A0538	Mohammad Ubaid Mohindelin			4	5	5	5	3	22
	17M51A0555	Robin Sing			4	5	5	4	3	21
16	17M51A0533	B.Mani Kanta	A New Approach To Reduce Food Wastage using U biquitous Technique	Dr. H.S Wankhade	4	6	5	5	3	23
	17L01A0504	G.Sai Renuka			4	5	5	5	3	22
	17L01A0503	D.Charan			3	4	5	6	3	21
	17L01A0505	K. Manikanta			3	5	4	5	3	20


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CHILKURU, MOHABAD, R.R. DISTRICT, T.S.

Class: IV Section: B

Mojib Department of Computer Science and Engineering
Consolidated Project Marks

A.Y: 2019-20

Batch no:	Roll No	Name of the Student	Topic	Internal guide	Problem Formation (4M)	Problem Solving (6M)	Design / Coding (6M)	Communicating Results (6M)	Documentation (3M)	Total Marks (25)
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	3	4	5	4	3	19
	16QM1A05A3	SUNKARI AJAY KUMAR			3	5	4	4	2	18
	167B1A0515	KOTHREPALY VANI			3	5	5	4	3	20
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	3	4	5	4	3	19
	16QM1A0583	SIGIRISETTI CHANDRIKA			3	5	4	4	2	18
	16QM1A05A5	PESSANI HARSHITHA			3	5	4	4	2	18
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	3	5	5	4	3	20
	16QM1A0597	VADDE KRISHNA			3	4	5	4	3	19
	17QM5A0501	KANAVATH SAIKIRAN NAIK			3	4	4	4	2	17
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	3	4	4	4	2	17
	167B1A0512	BASA PRAGNYA			3	4	5	4	3	19
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	3	5	5	4	3	20
	16QM1A0563	PANALA RAMADEVI			3	4	5	4	3	19
	16QM1A0573	PUNNA KAVYA			3	4	3	4	2	16
	16QM1A0572	PREMKUMAR CHEEPPURPALLI			3	4	4	4	2	17
	16QM1A05A1	VANAPALLI KRISHNASRI			3	5	4	4	2	18
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	3	4	4	4	2	17
	16QM1A0581	SANGAM APOORVA REDDY			3	5	4	4	2	18
	16QM1A0598	VADLAMANU VENKAT KALYAN			3	5	4	4	2	18
	16QM1A0586	SOPPOJI VENKATA SHASHANK			3	5	4	4	2	18
	16QM1A0588	SUNKI HARSHITHA REDDY			3	5	4	4	2	18
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	3	5	4	4	2	18
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			3	5	4	4	2	18
	16QM1A0589	SURAJ DILIP AIWALE			3	4	4	4	2	17
	16QM1A0593	TARUN KUMAR			3	4	4	4	2	17
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	3	5	5	4	3	20
	167B1A0514	CHUKKANNAGARI MOUNIKA			3	4	5	4	3	19
	16QM1A0577	RAVULAKOLLA NAVANEETHA			3	4	3	4	2	16
	167B1A0503	BHANUVARADHAN REDDY			3	4	5	4	3	19
9	16QM1A0578	RUDHRAGOWNI SIRITHA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	3	4	3	4	2	16
	16QM1A0559	NEELAPU ABHISHEK			3	4	4	4	2	17
	16QM1A05A2	YERRAMSETTY HIMA PRIYA			3	4	4	4	2	17
	16QM1A05A4	SHAIK RAFIQ AHMED			3	4	4	4	2	17
	167B1A0518	KALAL RAHUL GOUD			2	4	4	3	2	15
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	3	5	5	4	3	20
	16QM1A0565	PARIMI NAGA MOHITHA			3	4	5	4	3	19
	16QM1A0567	PEREPALLI KAVYA			3	5	4	4	2	18
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	3	4	3	4	2	16
	16QM1A0585	SOMADRI RAMYA			3	4	5	4	3	19
	16QM1A0592	TALLURI SANTHI SUDHA			3	4	4	4	2	17
12	16401A0575	S.VIJAY BHASKAR REDDY	SIFY WEED FROM PLANT SEEDL	PRISLLA	3	5	5	4	3	20
	16QM1A0595	TUPAKULA NIHARIKA			3	4	5	4	3	19
	16QM1A0579	S SHRAVANTHI			3	4	5	4	3	19

Batch no:	Roll No	Name of the Student	Topic	Internal guide	Problem Formation (4M)	Problem Solving (6M)	Design / Coding (6M)	Communicating Results (6M)	Documentation (3M)	Total Marks (25)
	16QM1A05A7	KESHABOINA DEEPAK			3	4	3	4	2	16
	16QM1A05A0	VALLALA BHAVANA			3	4	5	4	3	19
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	3	4	4	4	2	17
	16QM1A0560	NIMMAGADDA VARUN RAJA			3	5	4	4	2	18
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			3	4	3	4	2	16
	16QM1A0575	RANGASHALI MEGHANA			3	5	4	4	2	18
	16401A0586	P.SAI TEJA			3	4	4	4	2	17

Reviewer

PRC Coordinator

1. Dr. Srinivas Thare - Srinivz
2. L. Raghur Kumar - LRK
3. B.N. Motu - Motu

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DEPT. OF COMPUTER SCIENCE & ENGINEERING
S.G. REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHIKKURU, ANAParthi, R.J. DIST. AP.

K G Reddy College of Engineering & Technology

(Approved by AICTE, New Delhi, Affiliated to JNTUH, Hyderabad)

Chilkur (Village), Moinabad (Mandal), R. R Dist, TS-501504

Department of Computer Science and Engineering

Accredited by NAAC

A.Y: 2019-20

Project Review-1

Consolidated Marks

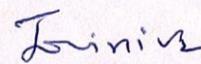
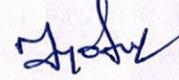
Date: 09-02-2020

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	3	3	3	3
	16QM1A05A3	SUNKARI AJAY KUMAR			3	3	3	3
	167B1A0515	KOTHREPALLY VANI			3	3	3	3
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	3	3	3	3
	16QM1A0583	SIGIRSETTI CHANDRIKA			3	3	3	3
	16QM1A05A5	PESSANI HARSHITHA			3	3	3	3
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	3	3	3	3
	16QM1A0597	VADDE KRISHNA			3	3	3	3
	17QM5A0501	KANAVATH SAIKIRAN NAIK			3	3	3	3
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	3	3	3	3
	167B1A0512	BASA PRAGNYA			3	3	3	3
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	3	3	3	3
	16QM1A0563	PANALA RAMADEVI			3	3	3	3
	16QM1A0573	PUNNA KAVYA			3	3	3	3
	16QM1A0572	PREMKUMAR CHEEPURPALLI			3	3	3	3
	16QM1A05A1	VANAPALLI KRISHNASRI			3	3	3	3
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	3	3	3	3
	16QM1A0581	SANGAM APOORVA REDDY			3	3	3	3
	16QM1A0598	VADLAMANU VENKAT KALYAN			3	3	3	3
	16QM1A0586	SOPPOJI VENKATA SHASHANK			3	3	3	3
	16QM1A0588	SUNKI HARSHITHA REDDY			3	3	3	3
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	3	3	3	3
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			3	3	3	3
	16QM1A0589	SURAJ DILIP AIWALE			3	3	3	3
	16QM1A0593	TARUN KUMAR			3	3	3	3
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	3	3	3	3
	167B1A0514	CHUKKANNAGARI MOUNIKA			3	3	3	3
	16QM1A0577	RAVULAKOLLA NAVANEETHA			3	3	3	3
	167B1A0503	BHANUVARADHAN REDDY			3	3	3	3

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
9	16QM1A0578	RUDHRAGOWNI SIRITHA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	3	3	3	3
	16QM1A0559	NEELAPU ABHISHEK			3	3	3	3
	16QM1A05A2	YERRAMSETTY HIMA PRIYA			3	3	3	3
	16QM1A05A4	SHAIK RAFIQ AHMED			3	3	3	3
	167B1A0518	KALAL RAHUL GOUD			2	2	2	2
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	3	3	3	3
	16QM1A0565	PARIMI NAGA MOHITHA			3	3	3	3
	16QM1A0567	PEREPALLI KAVYA			3	3	3	3
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	3	3	3	3
	16QM1A0585	SOMADRI RAMYA			3	3	3	3
	16QM1A0592	TALLURI SANTHI SUDHA			3	3	3	3
12	16401A0575	S.VIJAY BHASKAR REDDY	ASSIFY WEED FROM PLANT SEEDLING	PRISLLA	3	3	3	3
	16QM1A0595	TUPAKULA NIHARIKA			3	3	3	3
	16QM1A0579	S SHRAVANTHI			3	3	3	3
	16QM1A05A7	KESHABOINA DEEPAK			3	3	3	3
	16QM1A05A0	VALLALA BHAVANA			3	3	3	3
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	3	3	3	3
	16QM1A0560	NIMMAGADDA VARUN RAJA			3	3	3	3
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			3	3	3	3
	16QM1A0575	RANGASHALI MEGHANA			3	3	3	3
	16401A0586	P.SAI TEJA			3	3	3	3

Reviewer

PRC Coordinator

1. Dr. Srinivas Thade - 
2. L. Raghu Kumar - 
3. B.N. Motu - 


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DEPT. OF COMPUTER SCIENCE & ENGINEERING
K.S. REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHILKUR (M. INDRAJAD, R.R. DIST 501 504

07-03-2025

A.Y: 2019-20

Project Review-2 Consolidated Marks

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	4	4	4	4
	16QM1A05A3	SUNKARI AJAY KUMAR			5	5	5	5
	167B1A0515	KOTHREPALLY VANI			5	5	5	5
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	4	4	4	4
	16QM1A0583	SIGIRISETTI CHANDRIKA			5	5	5	5
	16QM1A05A5	PESSANI HARSHITHA			5	5	5	5
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	5	5	5	5
	16QM1A0597	VADDE KRISHNA			4	4	4	4
	17QM5A0501	KANAVATH SAIKIRAN NAIK			4	4	4	4
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	4	4	4	4
	167B1A0512	BASA PRAGNYA			4	4	4	4
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	5	5	5	5
	16QM1A0563	PANALA RAMADEVI			4	4	4	4
	16QM1A0573	PUNNA KAVYA			4	4	4	4
	16QM1A0572	PREMKUMAR CHEEPURPALLI			4	4	4	4
	16QM1A05A1	VANAPALLI KRISHNASRI			5	5	5	5
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	4	4	4	4
	16QM1A0581	SANGAM APOORVA REDDY			5	5	5	5
	16QM1A0598	VADLAMANU VENKAT KALYAN			5	5	5	5
	16QM1A0586	SOPPOJI VENKATA SHASHANK			5	5	5	5
	16QM1A0588	SUNKI HARSHITHA REDDY			5	5	5	5
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	5	5	5	5
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			5	5	5	5
	16QM1A0589	SURAJ DILIP AIWALE			4	4	4	4
	16QM1A0593	TARUN KUMAR			4	4	4	4
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	5	5	5	5
	167B1A0514	CHUKKANAGARI MOUNIKA			4	4	4	4
	16QM1A0577	RAVULAKOLLA NAVANEETHA			4	4	4	4
	167B1A0503	BHANUVARADHAN REDDY			4	4	4	4

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
9	16QM1A0578	RUDHRAGOWNI SIRITHA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	4	4	4	4
	16QM1A0559	NEELAPU ABHISHEK			4	4	4	4
	16QM1A05A2	YERRAMSETTY HIMA PRIYA			4	4	4	4
	16QM1A05A4	SHAIK RAFIQ AHMED			4	4	4	4
	167B1A0518	KALAL RAHUL GOUD			4	4	4	4
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	5	5	5	5
	16QM1A0565	PARIMI NAGA MOHITHA			4	4	4	4
	16QM1A0567	PEREPALLI KAVYA			5	5	5	5
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	4	4	4	4
	16QM1A0585	SOMADRI RAMYA			4	4	4	4
	16QM1A0592	TALLURI SANTHI SUDHA			4	4	4	4
12	16401A0575	S.VIJAY BHASKAR REDDY	SSIFY WEED FROM PLANT SEEDLIN	PRISLLA	5	5	5	5
	16QM1A0595	TUPAKULA NIHARIKA			4	4	4	4
	16QM1A0579	S SHRAVANTHI			4	4	4	4
	16QM1A05A7	KESHABOINA DEEPAK			4	4	4	4
	16QM1A05A0	VALLALA BHAVANA			4	4	4	4
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	4	4	4	4
	16QM1A0560	NIMMAGADDA VARUN RAJA			5	5	5	5
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			4	4	4	4
	16QM1A0575	RANGASHALI MEGHANA			5	5	5	5
	16401A0586	P.SAI TEJA			4	4	4	4

Reviewer

PRC Coordinator

1. Dr. Srinivas Thade - Srinivas
2. L. Raghu Kumar - LRK
3. B.N. Mohi - Mohi


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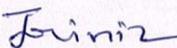
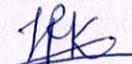
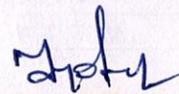
DEPT. OF COMPUTER SCIENCE & ENGINEERING
K.S. REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHILUKUR (V), MOINABAD, R.R. DIST. 509 504.

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	5	5	5	5
	16QM1A05A3	SUNKARI AJAY KUMAR			4	4	4	4
	167B1A0515	KOTHREPALLY VANI			5	5	5	5
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	5	5	5	5
	16QM1A0583	SIGIRISETTI CHANDRIKA			4	4	4	4
	16QM1A05A5	PESSANI HARSHITHA			4	4	4	4
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	5	5	5	5
	16QM1A0597	VADDE KRISHNA			5	5	5	5
	17QM5A0501	KANAVATH SAIKIRAN NAIK			4	4	4	4
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	4	4	4	4
	167B1A0512	BASA PRAGNYA			5	5	5	5
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	5	5	5	5
	16QM1A0563	PANALA RAMADEVI			5	5	5	5
	16QM1A0573	PUNNA KAVYA			3	3	3	3
	16QM1A0572	PREMKUMAR CHEEPURPALLI			4	4	4	4
	16QM1A05A1	VANAPALLI KRISHNASRI			4	4	4	4
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	4	4	4	4
	16QM1A0581	SANGAM APOORVA REDDY			4	4	4	4
	16QM1A0598	VADLAMANU VENKAT KALYAN			4	4	4	4
	16QM1A0586	SOPPOJI VENKATA SHASHANK			4	4	4	4
	16QM1A0588	SUNKI HARSHITHA REDDY			4	4	4	4
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	4	4	4	4
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			4	4	4	4
	16QM1A0589	SURAJ DILIP AIWALE			4	4	4	4
	16QM1A0593	TARUN KUMAR			4	4	4	4
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	5	5	5	5
	167B1A0514	CHUKKANNAGARI MOUNIKA			5	5	5	5
	16QM1A0577	RAVULAKOLLA NAVANEETHA			3	3	3	3
	167B1A0503	BHANUVARADHAN REDDY			5	5	5	5
9	16QM1A0578	RUDHRAGOWNI SIRITHA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	3	3	3	3
	16QM1A0559	NEELAPU ABHISHEK			4	4	4	4
	16QM1A05A2	YERRAMSETTY HIMA PRIYA			4	4	4	4
	16QM1A05A4	SHAIK RAFIQ AHMED			4	4	4	4
	167B1A0518	KALAL RAHUL GOUD			4	4	4	4

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	5	5	5	5
	16QM1A0565	PARIMI NAGA MOHITHA			5	5	5	5
	16QM1A0567	PEREPALLI KAVYA			4	4	4	4
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	3	3	3	3
	16QM1A0585	SOMADRI RAMYA			5	5	5	5
	16QM1A0592	TALLURI SANTHI SUDHA			4	4	4	4
12	16401A0575	S.VIJAY BHASKAR REDDY	LASSIFY WEED FROM PLANT SEEDLINGS	PRISLLA	5	5	5	5
	16QM1A0595	TUPAKULA NIHARIKA			5	5	5	5
	16QM1A0579	S SHRAVANTHI			5	5	5	5
	16QM1A05A7	KESHABOINA DEEPAK			3	3	3	3
	16QM1A05A0	VALLALA BHAVANA			5	5	5	5
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	4	4	4	4
	16QM1A0560	NIMMAGADDA VARUN RAJA			4	4	4	4
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			3	3	3	3
	16QM1A0575	RANGASHALI MEGHANA			4	4	4	4
	16401A0586	P.SAI TEJA			4	4	4	4

Reviewer


PRC Coordinator

1. Dr. Srinivas Thade - 
2. L. Panku Kumar - 
3. B.N. Jyoti - 

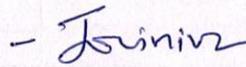
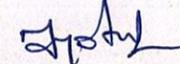

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K.S. REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHILKUR (V), MOINAABAD, R.R. DIST. 594 594

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	4	4	4	4
	16QM1A05A3	SUNKARI AJAY KUMAR			4	4	4	4
	167B1A0515	KOTHREPALLY VANI			4	4	4	4
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	4	4	4	4
	16QM1A0583	SIGIRISETTI CHANDRIKA			4	4	4	4
	16QM1A05A5	PESSANI HARSHITHA			4	4	4	4
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	4	4	4	4
	16QM1A0597	VADDE KRISHNA			4	4	4	4
	17QM5A0501	KANAVATH SAIKIRAN NAIK			4	4	4	4
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	4	4	4	4
	167B1A0512	BASA PRAGNYA			4	4	4	4
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	4	4	4	4
	16QM1A0563	PANALA RAMADEVI			4	4	4	4
	16QM1A0573	PUNNA KAVYA			4	4	4	4
	16QM1A0572	PREMKUMAR CHEEPURPALLI			4	4	4	4
	16QM1A05A1	VANAPALLI KRISHNASRI			4	4	4	4
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	4	4	4	4
	16QM1A0581	SANGAM APOORVA REDDY			4	4	4	4
	16QM1A0598	VADLAMANU VENKAT KALYAN			4	4	4	4
	16QM1A0586	SOPPOJI VENKATA SHASHANK			4	4	4	4
	16QM1A0588	SUNKI HARSHITHA REDDY			4	4	4	4
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	4	4	4	4
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			4	4	4	4
	16QM1A0589	SURAJ DILIP AIWALE			4	4	4	4
	16QM1A0593	TARUN KUMAR			4	4	4	4
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	4	4	4	4
	167B1A0514	CHUKKANNAGARI MOUNIKA			4	4	4	4
	16QM1A0577	RAVULAKOLLA NAVANEETHA			4	4	4	4
	167B1A0503	BHANUVARADHAN REDDY			4	4	4	4
9	16QM1A0578	RUDHRAGOWNI SIRITHA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	4	4	4	4
	16QM1A0559	NEELAPU ABHISHEK			4	4	4	4
	16QM1A05A2	YERRAMSETTY HIMA PRIYA			4	4	4	4
	16QM1A05A4	SHAIK RAFIQ AHMED			4	4	4	4

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
	167B1A0518	KALAL RAHUL GOUD			3	3	3	3
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	4	4	4	4
	16QM1A0565	PARIMI NAGA MOHITHA			4	4	4	4
	16QM1A0567	PEREPALLI KAVYA			4	4	4	4
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	4	4	4	4
	16QM1A0585	SOMADRI RAMYA			4	4	4	4
	16QM1A0592	TALLURI SANTHI SUDHA			4	4	4	4
12	16401A0575	S.VIJAY BHASKAR REDDY	CLASSIFY WEED FROM PLANT SEEDLINGS	PRISLLA	4	4	4	4
	16QM1A0595	TUPAKULA NIHARIKA			4	4	4	4
	16QM1A0579	S SHRAVANTHI			4	4	4	4
	16QM1A05A7	KESHABOINA DEEPAK			4	4	4	4
	16QM1A05A0	VALLALA BHAVANA			4	4	4	4
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	4	4	4	4
	16QM1A0560	NIMMAGADDA VARUN RAJA			4	4	4	4
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			4	4	4	4
	16QM1A0575	RANGASHALI MEGHANA			4	4	4	4
	16401A0586	P.SAI TEJA			4	4	4	4

Reviewer


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1. Dr. Srinivas Thade - 
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3. B.N.Moturi 


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CHILKUR (M), MOKHABAD, R.R. DIST.591 504.

Batch No	Roll No.	Name of the Student	Title	Guide name	Use of Engineering Design Process(2M)	Self-Improvement (1)	T(3M)
1	16QM1A0566	PARNANDI SAI SIRISHA	ORYZA	M.JYOTHI	2	1	3
	16QM1A05A3	SUNKARI AJAY KUMAR			1	1	2
	167B1A0515	KOTHREPALLY VANI			2	1	3
2	16QM1A0582	SANKU SHRUTHI	CARHEXA	K. RAMA KRISHNA REDDY	2	1	3
	16QM1A0583	SIGIRISETTI CHANDRIKA			1	1	2
	16QM1A05A5	PESSANI HARSHITHA			1	1	2
3	16QM1A0596	USMA BEGUM	GESTURE RECOGNITION BASED ON TENSORFLOW FRAME WORK	DR. SHANKAR .S	2	1	3
	16QM1A0597	VADDE KRISHNA			2	1	3
	17QM5A0501	KANAVATH SAIKIRAN NAIK			1	1	2
4	17QM5A0502	PASUPULA PRIYANKA	SMART MIRROR	DR.H.S.WANKHEDE	1	1	2
	167B1A0512	BASA PRAGNYA			2	1	3
5	16QM1A0564	PANTIKONDA RAJANI	ACCESSING MOBILE CONTROL SYSTEM	Y.VENKAT	2	1	3
	16QM1A0563	PANALA RAMADEVI			2	1	3
	16QM1A0573	PUNNA KAVYA			1	1	2
	16QM1A0572	PREMKUMAR CHEEPURPALLI			1	1	2
	16QM1A05A1	VANAPALLI KRISHNASRI			1	1	2
6	16QM1A0574	RAMADUGU GANESH	MODELING AND PREDICTING CYBER HACKING BREACHES	S.DIVYA	1	1	2
	16QM1A0581	SANGAM APOORVA REDDY			1	1	2
	16QM1A0598	VADLAMANU VENKAT KALYAN			1	1	2
	16QM1A0586	SOPPOJI VENKATA SHASHANK			1	1	2
	16QM1A0588	SUNKI HARSHITHA REDDY			1	1	2
7	16QM1A0584	SOHAIL MOHAMMED	PAYROLL SYSTEM	R.HIMA SAGARIKA	1	1	2
	16QM1A0562	PAMIDIMUKKALA SAI KAUSHIK			1	1	2
	16QM1A0589	SURAJ DILIP AIWALE			1	1	2
	16QM1A0593	TARUN KUMAR			1	1	2
8	167B1A0511	AVUSULA UMADEVI	DATA MANAGEMENT ISSUES IN MOBILE AD HOC NETWORK	DR.J.SRINIVAS	2	1	3
	167B1A0514	CHUKKANNAGARI MOUNIKA			2	1	3
	16QM1A0577	RAVULAKOLLA NAVANEETHA			1	1	2
	167B1A0503	BHANUVARADHAN REDDY			2	1	3
	16QM1A0578	RUDHRAGOWNI SIRITHA			1	1	2
	16QM1A0559	NEELAPU ABHISHEK			1	1	2

Batch No	Roll No.	Name of the Student	Title	Guide name	Use of Engineering Design Process(2M)	Self-Improvement (1)	T(3M)
9	16QM1A05A2	YERRAMSETTY HIMA PRIYA	DIABETES PREDICTION USING DIFFERENT MACHINE LEARNING APPROACHES	RAGHU KUMAR.L	1	1	2
	16QM1A05A4	SHAIK RAFIQ AHMED			1	1	2
	167B1A0518	KALAL RAHUL GOUD			1	1	2
10	167B1A0517	GORRE SOUMYA	PRIVACY-PRESERVING CONTENT-BASED IMAGE RETRIEVAL IN CLOUD STORAGE	DR.HEMANTH BHUYAN	2	1	3
	16QM1A0565	PARIMI NAGA MOHITHA			2	1	3
	16QM1A0567	PEREPALLI KAVYA			1	1	2
11	16QM1A0570	POORNIMA GAIKWAD	SUBMIT BUT TITTLE CHANGE	SUCHITRA	1	1	2
	16QM1A0585	SOMADRI RAMYA			2	1	3
	16QM1A0592	TALLURI SANTHI SUDHA			1	1	2
12	16401A0575	S.VIJAY BHASKAR REDDY	CLASSIFY WEED FROM PLANT SEEDLINGS	PRISLLA	2	1	3
	16QM1A0595	TUPAKULA NIHARIKA			2	1	3
	16QM1A0579	S SHRAVANTHI			2	1	3
	16QM1A05A7	KESHABOINA DEEPAK			1	1	2
	16QM1A05A0	VALLALA BHAVANA			2	1	3
13	16QM1A0568	PILLATI AKHILA	SMART RESCUE SYSTEM FROM BORE-WELL ACCIDENTS	VENKATESHWARLU	1	1	2
	16QM1A0560	NIMMAGADDA VARUN RAJA			1	1	2
	16QM1A0569	PILLI VENKAT AKHEEL KUMAR			1	1	2
	16QM1A0575	RANGASHALI MEGHANA			1	1	2
	16401A0586	P.SAI TEJA			1	1	2

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PRC Coordinator

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Department of Computer Science and Engineering

Major Project Review-1		Consolidated Marks			CSE - A	A.Y: 2018-19		Date: 20/09/2019	
Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average	
B1	15QM1A0528	GELLI MOUNIKA	Deypos:Deduplicatable Dynamic Proof of Stroage for multi-user environment	M . Jyothi	8	8	8	8	
	15QM1A0508	B KOMAL			8	8	8	8	
	15QM1A0548	M VIKRAM			7	7	7	7	
	15QM1A0506	B CHANDRASHEKAR			7	7	7	7	
B2	15QM1A0549	MADISHETTIWAR SUCHITRA SRINIVAS	Efficient Privarcy Preserving Location Based query over out sourced Encrypted Data	A . Harish	8	8	8	8	
	15QM1A0503	ANNU DEEPIKA			8	8	8	8	
	15QM1A0558	TUPPARI LAXMI PRASANNA			8	8	8	8	
B3	15QM1A0513	BYREDDY JYOTHI PRIYANKA	FRODO:fraud resilient device for off-line micro payment	Hemanth Buyya	8	8	8	8	
	15QM1A0556	SAHERI PAVANI			7	7	7	7	
	15QM1A0511	B RAMBHARATH			8	8	8	8	
	15QM1A0515	CHALLA ADITHYA			7	7	7	7	
B4	15QM1A0529	GODALA SAI NIKHIL REDDY	Cyber Bullying detection based on sematic enhanced marginalized demising auto -encoder	K .Rama Krishna	8	8	8	8	
	15QM1A0537	KATTA ARUN TEJA			8	8	8	8	
	15QM1A0544	KRISHNAGIRI TUPPAL VENUGOPALAN			8	8	8	8	
	15QM1A0560	YASHWANTH GADDAM			8	8	8	8	
B5	15QM1A0524	GANGALA PRIYANKA REDDY	Dual erver public key encryption with keyword search for secure cloud storage	M . Raj Kumar	8	8	8	8	
	15QM1A0518	DODDI SWETHA			8	8	8	8	
	15QM1A0534	K SADANA			8	8	8	8	
	15QM1A0507	B JHANSI LAKSHMI			8	8	8	8	
B6	15QM1A0525	GATLA SURAJ KUMAR	nearest keyword set search in m lti-dimensional datasets	Y. Venkat Rao	8	8	8	8	
	15QM1A0536	KATHROTIYA AVANI PATEL			8	8	8	8	
	15QM1A0526	GATTU SPANDANA			8	8	8	8	
	15QM1A0554	R SEVITHA			8	8	8	8	
B7	15QM1A0514	C SAMARA SIMHA REDDY	Energy and memory efficient clone detection in wireless sensor networks	M . Ram Babu	8	8	8	8	
	15QM1A0505	AVULA SIVA PRASAD			8	8	8	8	
	15QM1A0540	KETHIREDDU DAVAN			7	7	7	7	
	15QM1A0541	KODURI SAI KUMAR			8	8	8	8	

Batch No	Roll No.	Name of the Student	Title	Guide name	Reviewer1	Reviewer2	Reviewer3	Average
B8	15QM1A0521	ELUGALA NITHIN BABU	Connecting social media to E-Commerce: cold-start products Recommendation using Microblogging information	M. Joy Kumar	8	8	8	8
	15QM1A0523	GAJJALA SHIVA DATTA			8	8	8	8
	15QM1A0546	KUNTLOOR CHANDRA SHEKAR REDDY			8	8	8	8
	15QM1A0519	DURGAM LAXMAN			8	8	8	8
B9	15QM1A0532	GOUNDLA NAVEEN KUMAR	Fine-grained two factors access control for web based cc services	K. Rama Krishna Reddy	8	8	8	8
	15QM1A0547	LOKA DIXITH REDDY			8	8	8	8
	15QM1A0509	BALLA VINAY YADAV			8	8	8	8
	15QM1A0542	KOTLA MANIDEPAK			7	7	7	7
B10	15QM1A0550	MALGA KARTHIK	Pocket money manager	L. Raghu Kumar	8	8	8	8
	15QM1A0552	MEERAMPALLY KARTHIK			8	8	8	8
	15QM1A0538	KAVALI AKHIL YADAV			7	7	7	7
	15QM1A0502	ANNAMONI AKSHAY KUMAR			8	8	8	8
B11	15QM1A0539	KAVIDI DEVI HARI KANTH	Mapping bug reposts to relevant files :A ranking model ,fine-grained benchmark and feature evaluation	Goushya Bhanu	7	7	7	7
	15QM1A0533	HARISHWAR			7	7	7	7
	15QM1A0527	GAURAV DAYAMA			7	7	7	7
	15QM1A0520	DURGAM RAMU			7	7	7	7
B12	15QM1A0553	MENTE BILWANI LAKSHMI KRANTHI	DATA PREEPROCESSING AND MODEELING FOR EMPRICAL DATA	L. Raghu Kumar	8	8	8	8
	15QM1A0557	TIRUNAGARI SAI SRUJANA			8	8	8	8
B13	15QM1A0510	BATCHU NEERAJA	Deep Learning using Python	HOD	8	8	8	8
	15QM1A0522	GADHIRAJU SRAVANI			8	8	8	8

Reviewer

L. Raghu Kumar 

B. N. Jyothi - Jyothi

Dr. Srinivas J - Srinivas


PRC Coordinator


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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
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CHILKUR, MOINABAD, R.R. DIST. T.S.

A MAJOR PROJECT REPORT
ON
VOICE BOT FOR COMPLAINT REGISTRATION

Submitted to JNTUH in the partial fulfilment of the Academic Requirements for the award of the degree of

BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING

BY

MARVAPALLY MAHARSHI REDDY - 17QM1A0559
MOHD JAMEEL AHMED - 17QM1A0567
TELUGU SAI VINAY - 17QM1A0587
RENUKUNTLA RAHUL - 17QM1A0575

UNDER THE GUIDANCE OF

Mr. N. SRINIVAS

Assistant Professor



KG REDDY

College of Engineering
& Technology

Engineering India's Changemakers

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KG REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

(Accredited by NAAC, approved by AICTE, New Delhi, Affiliated to JNTUH, Hyderabad)

Chilkur (Village), Moinabad. (Mandal), R. R Dist, TS-501504.

Batch: 2020-21.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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Chilkur (Village), Moinabad (Mandal), R. R Dist, TS-501504.



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Engineering India's Changemakers

CERTIFICATE

This is to certify that the Project report on “**VOICE BOT FOR COMPLAINT REGISTRATION**” Is a bonafide record work carried out by **MARVAPALLY MAHARSHI REDDY (17QM1A0559)**, **MOHD JAMEEL AHMED (17QM1A0567)**, **TELUGU SAI VINAY (17QM1A0587)**, **RENUKUNTLA RAHUL (17QM1A0575)** in partial fulfilment for the requirement for the award of degree of **BACHELOR OF TECHNOLOGY** in “**COMPUTER SCIENCE AND ENGINEERING**”, JNTUH, Hyderabad during the year 2020-2021.

INTERNAL GUIDE

Mr. N. SRINIVAS

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CHILKUR(V), MOINABAD(M), R.R. DIST. T.S.

ABSTRACT

This project presents research work on a system that is capable of providing real time remote Gas monitoring and SMS alert system. The work aimed at the design and implementation of a low cost but efficient and flexible Gas detection monitoring and alert system using GSM technology. It was designed in such a way that the monitoring of Gas Leakage detection would be achieved with the use of MQ-135, GSM Module, Servo Motor sensors coupled with a control unit and transmitter module all of which are battery powered. Gas and Smoke are sensed and measured by sensors which send the signals to the control unit for proper processing and determination of smoke rate.

This is displayed in an Android Mobile Application, then an alert is sent to the mobile phone of Gas Alert system personnel via SMS while simultaneously triggering an alarm in the control room. Thus, this system presents a continuous, real time, remote, safe and accurate monitoring of gas and smoke rate, hence ensuring the conservation and preservation of the warehouse.



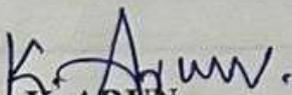
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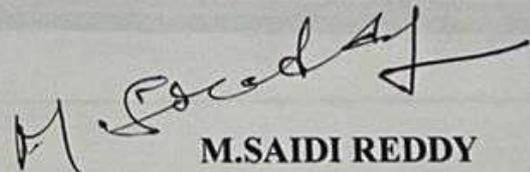
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Chilkur Vill, Moinabad Mandal, R.R.Dist-501504, P: 9247033008, 9000633008.
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CERTIFICATE

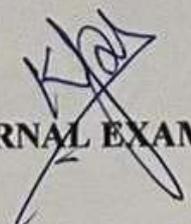
This is to certify that the project entitled "GAS LEAKAGE CONTROL SYSTEM" is being submitted by K GANESH KUMAR – 14QM1A0525, K SWATHIRAJ -14QM1A0544 & D SHRAVYA – 14QM1A0520 of B. Tech in partial fulfillment of the requirement for the award of the degree in BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING, to the Jawaharlal Nehru Technological University, Hyderabad, is a record of the bonafide work carried out by them under our guidance and supervision. The results embodied in this project have not been submitted to any other University or Institute for the award of any degree or diploma.


K. ARUN

(Assistant Professor)
INTERNAL GUIDE



M.SAIDI REDDY
(Associate Professor)
HEAD OF THE DEPARTMENT


EXTERNAL EXAMINER

ABSTRACT

In traditional appointment system patients has to come to the hospital and queue at the appointment window to make the appointment. But they usually end up waiting for very long time. With the help of online appointment patient doesn't have to wait for his or her turn. The patient can, however decide to schedule an appointment ,but this option doesn't usually work well for all parties involved. Parties involved includes the patient, medical personnel and the hospital. Thus, this project focuses on making a system which help customers to book appointments online along with other useful features. Online appointment scheduling system is a system through which a user or simply patient can access the website or app and manager of the clinic or the receptionist can update the status of the patients making it more informative. For doctors, online appointment can bring a lot of value add services and benefits, like engaging the patient, making the patient feel appreciated and being able to store patients' data securely for future references. But the most wonderful and useful advantage is that online appointment scheduling in amazingly low.

A Project Report On

GAS LEAKAGE CONTROL SYSTEM

Submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

(In partial fulfillment of the requirements for the award of bachelor degree)

In

COMPUTER SCIENCE AND ENGINEERING

By

K GANESH KUMAR

(14QM1A0525)

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(14QM1A0544)

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Under the esteemed guidance of

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Batch: 2014-18

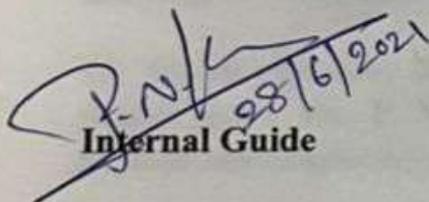
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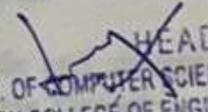
CERTIFICATE

This is to certify that the Project report on "ONLINE OPD APPOINTMENT AND HOSPITAL MANAGEMENT SYSTEM" is a bonafide record work carried out by A. Pooja Shreeni(17QM1A0502), A. Neha(17QM1A0508) C. MAHESHWARI (17QM1A0521), K. Praneeth Reddy(17QM1A0550) in partial fulfillment for the requirement for the award of degree of BACHELOR OF TECHNOLOGY in "COMPUTER SCIENCE AND ENGINEERING", JNTUH, Hyderabad during the year 2020-2021


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Professor & HOD, CSE

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A MAJOR PROJECT REPORT

ON

ONLINE OPD APPOINTMENT AND HOSPITAL MANAGEMENT SYSTEM

Submitted to JNTUH in the partial fulfillment of the Academic Requirements for the
award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

BY

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Chilkur(village), Moinabad (Mandal), R.R Dist., TS-501504

2020-21

ABSTRACT

Water Covers about 71% of our Earth. But we still face scarcity of water and drought conditions. This is because about 70% of water is salt water which cannot be used for day to day usage. Only 1% of water is consumable and usable.

In order to solve this water scarcity, we have to hold every drop of rain water safely to use it. Our Solution provides an easy way to preserve rain water and utilize them in unconditional situations.

NESSUKA checks the purity level of water by using IOT technology. We use sensors to check the purity and also we are providing additional feature to check the level of water present in the tank (House hold). We developed this prototype by using pH sensor, TDS sensor and ultrasonic sensors. These sensors values are stored in the webpage and this can be used for further reference. The user can check the status of the tank through mobile application or web application. The user can able to add multiple devices by entering the device ID which we are providing as unique for each product. And also he can view the number of working pumps under his current locality. This data can be helpful to the government to develop the city.

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This is to certify that the project entitled "NESSUKA" is being submitted by
KANNEDARI GOPI KRISHNA-14QM1A0536, KRISHNA MOORTHY-14QM1A0553,
GANJI SRIKANTH-14QM1A0526 & AKULA SAI MANISH CHANDRA -14QM1A0502 of
B.Tech in partial fulfillment of the requirement for the award of the degree in **BACHELOR OF
TECHNOLOGY** in **COMPUTER SCIENCE AND ENGINEERING**, to the Jawaharlal Nehru
Technological University, Hyderabad, is a record of the bonafide work carried out by them under our
guidance and supervision. The results embodied in this project have not been submitted to any other
University or Institute for the award of any degree or diploma.

L.RAGHU KUMAR
(Assistant Professor)
INTERNAL GUIDE

M.SAIDI REDDY
(Associate Professor)
HEAD OF THE DEPARTMENT

EXTERNAL EXAMINER

A Project Report on

NESSUKA

Submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

(In partial fulfillment of the requirements for the award of bachelor degree)

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

By

KANNEDARI GOPI KRISHNA (14QM1A0536)

KRISHNA MOORTHY (14QM1A0553)

GANJI SRIKANTH (14QM1A0526)

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New Age Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
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Batch: 2014-18

ABSTRACT

Farming is a major input sector for economic development of any country. Livelihood of majority of population of the country like India depends on agriculture. In this project, we proposed to develop a Smart Farming System that uses advantages of cutting edge technologies such as IoT and Wireless Sensor Network to help farmers enhance the way farming is done. Using sensors like temperature, humidity, soil moisture etc. are used to get information about the field and help farmers to take precise decisions on insights and recommendations based on the collected data. The farmers are precisely two types, educated and uneducated. So, for the farmers who are uneducated, a message is sent to the mobile phone, so that he can get the info and he can supervise the field even by sitting in home. The farmers who are educated can check the webpage regularly, and can take their steps for better yield of the crop.



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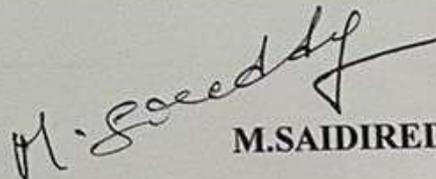
CERTIFICATE

This is to certify that this is the bonafide record of the project titled "Smart Farming System" is submitted by N.V.L.NEELIMA-14QM1A0567 of B.Tech in the partial fulfillment of the requirement for the degree of Bachelor of Computer Science and Engineering, Dept. of CSE during the year 2018. The results embodied in this project report have not been submitted to any other university or institute for the award of any degree or diploma.

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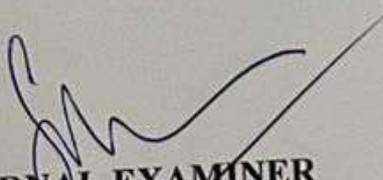
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EXTERNAL EXAMINER

**A Project Report on
IOT Based Smart Farming System**

Submitted to

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD**

(In partial fulfillment of the requirements for the award of bachelor degree)

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

By

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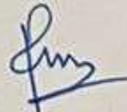
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This is to certify that this is the bonafide record of the Major project report titled "GESTURE RECOGNITION BASED ON TENSOR FLOW FRAMEWORK" is submitted by USMA BEGUM (16QM1A0596), VADDE KRISHNA (16QM1A0597), K. SAI KIRAN NAIK (17QM5A0501) of B. Tech in the partial fulfillment of the requirement for the degree of Bachelor of Technology, Dept. of Computer Science and Engineering, during the year 2016-2020. The results embodied in this Major project report have not been submitted to any other university or institute for the award of any degree.


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EXTERNAL EXAMINER

ABSTRACT

In cloud computing, users can achieve an effective and economical approach for data sharing among group members in the cloud. Meanwhile, we must provide security for the sharing data files since they are outsourced. Unfortunately, because of the frequent change of the membership, sharing data while providing privacy-preserving is still a challenging issue, especially for an untrusted cloud due to the collusion attack. Moreover, for existing schemes, the security of key distribution is based on the secure communication channel, however, to have such channel is a strong assumption and is difficult for practice.

In this paper, we propose a secure data sharing scheme for dynamic members. Firstly, we propose a secure way for key distribution without any secure communication channels, and the users can securely obtain their private keys from group manager. Any user in the group can use the resource in the cloud and revoked users cannot access the cloud again after they are revoked. Thirdly, we can protect the scheme from collusion attack, which means that revoked users cannot get the original data file even if they conspire with the untrusted cloud. By using polynomial function, we can achieve a secure user revocation scheme. Finally, our scheme can achieve fine efficiency, which means previous users need not to update their private keys for the situation either a new user joins in the group or a user is revoked from the group.



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CERTIFICATE

This is to certify that the project entitled "A SECURE AND SIGNATURE BASED DATA SHARING SCHEME FOR DYNAMIC GROUPS IN THE CLOUD" is being submitted by M. SAIKIRAN REDDY, P. SHASHIDAR REDDY, P. AJAY REDDY, S. HARIKA, T. SWAPNA - 14QM1A0562, -14QM1A0575, -14QM1A0576, - 14QM1A0593, - 14QM1A05A2 of B. Tech in partial fulfillment of the requirement for the award of the degree in BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING, to the Jawaharlal Nehru Technological University, Hyderabad, is a record of the bonafide work carried out by them under my guidance and supervision. The results embodied in this project have not been submitted to any other University or Institute for the award of any degree or diploma.

S. KRUSHIMA

(Assistant Professor)

M. SAIDI REDDY

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EXTERNAL EXAMINER

A Project Report

on

**A SECURE AND SIGNATURE BASED DATA SHARING
SCHEME FOR DYNAMIC GROUPS IN THE CLOUD**

Submitted to

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD**

(in partial fulfillment of the requirements for the award of bachelor degree)

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

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P. AJAY REDDY	(14QM1A0576)
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ABSTRACT

As a side effect of increasingly popular social media, cyberbullying has emerged as a serious problem afflicting children, adolescents and young adults. Machine learning techniques make automatic detection of bullying messages in social media possible, and this could help to construct a healthy and safe social media environment. In this meaningful research area, one critical issue is robust and discriminative numerical representation learning of text messages. In this paper, we propose a new representation learning method to tackle this problem. Our method named Semantic-Enhanced Marginalized Denoising Auto-Encoder (smSDA) is developed via semantic extension of the popular deep learning model stacked denoising autoencoder. The semantic extension consists of semantic dropout noise and sparsity constraints, where the semantic dropout noise is designed based on domain knowledge and the word embedding technique. Our proposed method is able to exploit the hidden feature structure of bullying information and learn a robust and discriminative representation of text.



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This is to certify that the project entitled “**Cyber-bullying Detection**” is being submitted by **Appam Arun Kumar - 16QM1A0508, Donthula Abhilash – 16QM1A0522, Kanduri Rohit Kumar – 16QM1A0539, Katta Akhila – 16QM1A0541** of B.Tech in the partial fulfillment of the requirement for the award of the degree in BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING, to the Jawaharlal Nehru Technological University, Hyderabad is a record of the bonafide work carried out by them under my guidance and supervision. The results embodied in this project report have not been submitted to any other university or institute for the award of any degree.

L. RAGHU KUMAR (Ph.D)
Assistant Professor
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Dr. HANSARAJ S. WANKHEDE
Associate Professor
HEAD OF THE DEPARTMENT

EXTERNAL EXAMINER

A Project Report
On
CYBER-BULLYING DETECTION

Submitted to
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

(In partial fulfillment of the requirements for the award of bachelor degree)

In
COMPUTER SCIENCE AND ENGINEERING

By

APPAM ARUN KUMAR	(16QM1A0508)
DONTHULA ABHILASH	(16QM1A0522)
KANDURI ROHIT KUMAR	(16QM1A0539)
KATTA AKHILA	(16QM1A0541)

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ABSTRACT

Searchable encryption is of increasing interest for protecting the data privacy in secure searchable cloud storage. In this paper, we investigate the security of a well-known cryptographic primitive, namely, public key encryption with keyword search (PEKS) which is very useful in many applications of cloud storage. Unfortunately, it has been shown that the traditional PEKS framework suffers from an inherent insecurity called inside keyword guessing attack (KGA) launched by the malicious server. To address this security vulnerability, we propose a new PEKS framework named dual-server PEKS (DS-PEKS). As another main contribution, we define a new variant of the smooth projective hash functions (SPHF) referred to as linear and homomorphic SPHF (LH-SPHF). We then show a generic construction of secure DS-PEKS from LH-SPHF. To illustrate the feasibility of our new framework, we provide an efficient instantiation of the general framework from a Decision Diffie–Hellman-based LH-SPHF and show that it can achieve the strong security against inside the KGA.



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This is to certify that the project entitled "DUAL SERVER PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH FOR SECURE CLOUD STORAGE" is being submitted by **B. Jhansi Lakshmi - 15QMIA0507** of B.Tech in the partial fulfillment of the requirement for the award of the degree in **BACHELOR OF TECHNOLOGY** in **COMPUTER SCIENCE AND ENGINEERING**, to the Jawaharlal Nehru Technological University, Hyderabad is a record of the bonafide work carried out by them under my guidance and supervision. The results embodied in this project have not been submitted to any other university or institute for the award of any degree.

M. Rajkumar

M. RAJ KUMAR

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Associate Professor
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EXTERNAL EXAMINER

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ABSTRACT

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CERTIFICATE

This is to certify that the project entitled "DUAL SERVER PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH FOR SECURE CLOUD STORAGE" is being submitted by **B. Jhansi Lakshmi - 15QMIA0507** of B.Tech in the partial fulfillment of the requirement for the award of the degree in **BACHELOR OF TECHNOLOGY** in **COMPUTER SCIENCE AND ENGINEERING**, to the Jawaharlal Nehru Technological University, Hyderabad is a record of the bonafide work carried out by them under my guidance and supervision. The results embodied in this project have not been submitted to any other university or institute for the award of any degree.

M. Rajkumar

M. RAJ KUMAR

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EXTERNAL EXAMINER

ABSTRACT

In the era of modern computing, the design and implementation of voice bot have received a great attention and importance from developers, users and researchers. In the age of conventional interface, we came across many AI (Artificial Intelligence) based bots through which the communication between humans and machines made easy. Now-a-days the use of chat bots is almost everywhere but the user need to type the text which is a type consuming process so we have designed an application that can register complaint using voice commands. This application has been developed using the technologies like AI, NLP (Natural Language Processing), IVR (Interactive voice response), and predefined bot Logic. This voice bot has a wide range of applications some of them are in education, offices, industry, research, space related studies and many more. In large organizations and offices complaints need to be registered, feedback need to be taken from users on a timely basis for better progress in order to do this there is a huge need of man power, these voice bots play a major role in minimizing the man power by registering the complaints behalf of humans. These voice bots are developed to provide an extraordinary and seamless experience to the users.

Keywords: - *AI, NLP, IVR, voice bot, chat bot.*

A Project Report
On
DUAL SERVER PUBLIC KEY ENCRYPTION WITH
KEYWORD SEARCH FOR SECURE CLOUD STORAGE

Submitted to
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

(In partial fulfillment of the requirements for the award of bachelor degree)

BACHELOR OF TECHNOLOGY

In
COMPUTER SCIENCE AND ENGINEERING

By
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ABSTRACT

Agriculturists are facing loss due to various crop diseases. It becomes difficult for the cultivators to monitor the crops on regular basis when the cultivated area is huge in terms of acres. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity and productivity is affected. Smart farming is need of the hour of the Indian economy. There is a need of an automatic, accurate and less expensive system for detection of diseases from the image and to suggest a proper pesticide as a solution. The most significant part of our research is early detection the disease as soon as it starts spreading on the top layer of the leaves using remote sensing images. This approach has two phases: first phase deals with training the model for healthy and as well as diseased images , second phase deals with monitoring of crops and identification of particular disease using KNN algorithm and also intimate the agriculturists with an early alert message immediately.

A Major-Project Report On

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Submitted to

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD**

(In partial fulfillment of the requirements for the award of bachelor degree)

In

COMPUTER SCIENCE AND ENGINEERING

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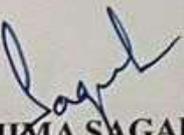
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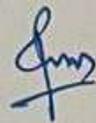
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CERTIFICATE

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K.G. REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
CHILKUR (V), MOINABAD, R.R. DIST.501 504.

EXTERNAL EXAMINER

A MAJOR PROJECT REPORT
ON
A PORTAL FOR ONLINE FOOD ORDERING SYSTEM IN LOCAL AREAS
THROUGH LOCAL CHEFS

Submitted to JNTUH in the partial fulfillment of the Academic Requirements
for the award of the degree of

BACHELOR OF TECHNOLOGY

IN
COMPUTER SCIENCE AND ENGINEERING

BY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KG REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

(Accredited by NAAC, approved by AICTE, New Delhi, Affiliated to JNTUH, Hyderabad)

Chilkur (Village), Moinabad (Mandal), R. R Dist, TS-501504

2020-21

ABSTRACT

The main aim of this Online Food ordering system is a process in which one can order various foods and beverages from local chef through the use of internet, just by sitting at home or any place. And the order is delivered to the concerned location. And in this pandemic situation as it is not safe to go outside and buy food so just by one tap food is away from us. We can order food from any chefs which are available on the portal and the food will be delivered on time. The system allows to quickly and easily manage an online menu which customers can browse and use to place orders with just few clicks. Customer can add as many items as he want into the cart. Customer can also choose the payment whether it is online payment by using Googlepay, amazon pay or he can also choose cash on delivery option. The main aim of the project is to give connect to the people online.

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ABSTRACT

The main idea of this project is based on the combination of recognized dataset and self-collected dataset. The project results show that the model has high recognition accuracy, high computational efficiency, strong robustness, and can easily adjust the network structure, find the optimal model quickly, and accomplish the task of gesture recognition better. Tensor flow framework to build the model of gesture recognition, introduces the platform characteristics of Tensor flow, and puts forward a convolution network model based on Tensor flow framework. The model CNN is based on training and recognition. The main difference is that for each and every particular gesture specific code or barcode will be assigned as a input and recognizes the output. The input of the recognition part directly use the network sample obtained from the training, and the test sets are mapped through each layer of the network, and the output is the recognition result.

1.2 Purpose of Project

The project aims to design a gesture recognition system based on TensorFlow framework to build the model of gesture recognition, introduces the platform characteristics of TensorFlow, and puts forward a convolution network model based on TensorFlow framework. The experiment is designed with the combination of recognized dataset and self-collected dataset.

ABSTRACT

The main idea of this project is based on the combination of recognized dataset and self-collected dataset. The project results show that the model has high recognition accuracy, high computational efficiency, strong robustness, and can easily adjust the network structure, find the optimal model quickly, and accomplish the task of gesture recognition better. Tensor flow framework to build the model of gesture recognition, introduces the platform characteristics of Tensor flow, and puts forward a convolution network model based on Tensor flow framework. The model CNN is based on training and recognition. The main difference is that for each and every particular gesture specific code or barcode will be assigned as a input and recognizes the output. The input of the recognition part directly use the network sample obtained from the training, and the test sets are mapped through each layer of the network, and the output is the recognition result.

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**A Project Report
On
GESTURE RECOGNITION BASED ON TENSOR FLOW
FRAMEWORK**

**Submitted to
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD**

(In partial fulfillment of the requirements for the award of bachelor degree)

**In
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CERTIFICATE

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CHILKUR, MOINABAD, R.R. DIST. T.S.

External Examiner

A Project Report On

GAS LEAKAGE CONTROL SYSTEM

Submitted to

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

(In partial fulfillment of the requirements for the award of bachelor degree)

In

COMPUTER SCIENCE AND ENGINEERING

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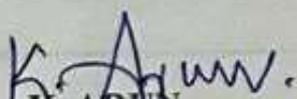
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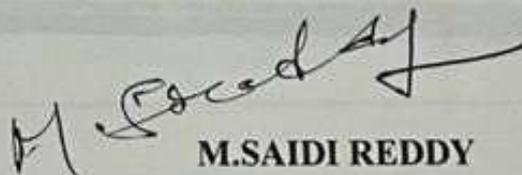
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This is to certify that the project entitled "GAS LEAKAGE CONTROL SYSTEM" is being submitted by K GANESH KUMAR – 14QM1A0525, K SWATHIRAJ -14QM1A0544 & D SHRAVYA – 14QM1A0520 of B. Tech in partial fulfillment of the requirement for the award of the degree in BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING, to the Jawaharlal Nehru Technological University, Hyderabad, is a record of the bonafide work carried out by them under our guidance and supervision. The results embodied in this project have not been submitted to any other University or Institute for the award of any degree or diploma.


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(Assistant Professor)
INTERNAL GUIDE



M.SAIDI REDDY
(Associate Professor)
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EXTERNAL EXAMINER

ABSTRACT

This project presents research work on a system that is capable of providing real time remote Gas monitoring and SMS alert system. The work aimed at the design and implementation of a low cost but efficient and flexible Gas detection monitoring and alert system using GSM technology. It was designed in such a way that the monitoring of Gas Leakage detection would be achieved with the use of MQ-135, GSM Module, Servo Motor sensors coupled with a control unit and transmitter module all of which are battery powered. Gas and Smoke are sensed and measured by sensors which send the signals to the control unit for proper processing and determination of smoke rate.

This is displayed in an Android Mobile Application, then an alert is sent to the mobile phone of Gas Alert system personnel via SMS while simultaneously triggering an alarm in the control room. Thus, this system presents a continuous, real time, remote, safe and accurate monitoring of gas and smoke rate, hence ensuring the conservation and preservation of the warehouse.

A Major-Project Report On

ORYZA

Submitted to

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD**

(In partial fulfillment of the requirements for the award of bachelor degree)

In

COMPUTER SCIENCE AND ENGINEERING

By

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Batch: 2016-2020

DECLARATION

We hereby declare that the project entitled “**ORYZA**” submitted to **KG Reddy College of Engineering and Technology**, affiliated to Jawaharlal Nehru Technological University Hyderabad (JNTUH) for the award of the degree of **Bachelor of Technology in Computer Science and Engineering** is a result of project work done by us.

It is further declared that the project report or any part there of has not been previously submitted to any University or Institute for the award of degree or diploma.

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INTERNAL GUIDE**

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ASSOCIATE PROFESSOR
HEAD OF THE DEPARTMENT**

EXTERNAL EXAMINER

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ABSTRACT

Agriculturists are facing loss due to various crop diseases. It becomes difficult for the cultivators to monitor the crops on regular basis when the cultivated area is huge in terms of acres. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity and productivity is affected. Smart farming is need of the hour of the Indian economy. There is a need of an automatic, accurate and less expensive system for detection of diseases from the image and to suggest a proper pesticide as a solution. The most significant part of our research is early detection the disease as soon as it starts spreading on the top layer of the leaves using remote sensing images. This approach has two phases: first phase deals with training the model for healthy and as well as diseased images , second phase deals with monitoring of crops and identification of particular disease using KNN algorithm and also intimate the agriculturists with an early alert message immediately.

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1. INTRODUCTION

1.1 Background:

The agricultural land mass is more than just being a feeding sourcing in today's world . Indian economy is agriculture based and it is the main source of rural livelihood. Indian economy is highly dependent of agricultural productivity. Therefore in field of agriculture, detection of disease in plants plays an important role. Every living being depends on agriculture for food. But for better yield, the crops should be healthy therefore some highly technical method is needed for periodic monitoring. Plant disease is one of the important factor where it can cause significant reduction of quality and quantity of agriculture products. Due to the exponential inclination of population, the climatic conditions also cause the plant disease. The plants suffer from diseases that can drastically affect the quantity and quality of the yield. Usually the detection and identification of leaf diseases is performed by farmers by naked eye observation . It leads to incorrect diagnosis as the farmer's judge the symptoms by their experience. This will also cause needless and excess use of costly pesticides. Therefore the automatic detection of disease is important which will help in early and accurate diagnosis of leaf diseases The major challenges of sustainable development is to reduce the usage of pesticides, cost to save the environment ad to increase the quality. Precise, accurate and early diagnosis may reduce the usage of pesticides. Consequently, effective monitoring of the incidence and severity of crop diseases is of great importance to guide the spray of pesticides. The existing method for plant disease detection is simply naked eye observation by experts through which identification and detection of plant diseases is done. For doing so, a large team of experts as well as continuous monitoring of plant is required, which costs very high when we do with large farms. At the same time, in some countries, farmers do not have proper facilities or even idea that they can contact to experts. Due to which consulting experts even cost high as well as time consuming too. In such conditions, the suggested technique proves to be beneficial in monitoring large fields of crops. Automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper. Machine Learning provides a possible way to detect the incidence and severity of the disease rapidly. This approach starts with training of images for both the samples such as healthy and disease leaf images.[1]

1.2 Problem Statement:

Paddy will be harvest twice in a year. Most of paddy farmer faces many problems to harvest their paddy because they used to attack by snail, worm and fungi. Furthermore, when the paddy had been infected or attacked, the others areas had been exposed to be infected. Thus, it will decrease paddy farmer's income and lead to significance losses to farmer. Currently, the paddy farmer determines the type of disease manually. The errors might occur in order to determine the type of diseases. Paddy farmer also have to spend a lot of time to detect the type of disease. It also takes a time as the paddy farmers manually check the disease since the paddy field is in wide area.

1.3 Scope of Study:

- The users of the system are general farmer.
- The prototype is designed in python.
- 200 total samples of normal, brown spot disease, narrow brown spot disease and blast disease is used in this.

2 .LITERATURE SURVEY

2.1 Introduction:

This surveys, clarifies and talks about on existing writing audit related with our research topic which is "Study on Paddy Disease Detection". This part includes three areas. The primary segment portrays the outlines of paddy. The subsections are the definition, kind of paddy infection, paddy manifestation and paddy administration. The second area is the survey of some current framework that utilized same strategies and techniques. The third area talks about the survey on strategy and technique utilized by the framework.

2.2 Paddy Overviews:

2.2.1 Definition of Paddy

Paddy otherwise called rice is the dull seeds of a yearly south-east Asian grain grass (*Oryza sativa*) that are cooked and utilized for sustenance. This grain grass that is broadly developed in warm atmospheres for its seeds and results. Rice is a standout amongst the most used sustenance plants and generally developed began in ASIA. Rice is a critical product worldwide and over portion of the total populace depends on it for sustenance. Numerous individuals on the planet including Bangladesh eat rice as staple nourishment.[2]

2.2.2 Paddy Diseases Symptoms:

There are numerous elements that influence paddy to rice generation turn out to be moderate and less profitable. One of the fundamental elements is paddy disease. The statements beneath will indicate three kind of paddy disease, the symptom of paddy disease and the management of paddy disease. This inquires about spotlight on three sorts of diseases, which are paddy blast, brown spot disease and narrow brown spot disease.[2]

2.2.2.1 Paddy Blast Symptoms:

- Disease infect paddy at growth stages and aerial parts of plant (leaf, neck and node)
- Among the three leaves and neck infections are more severe
- Small specks originate on leaves
- Several spots coalesce to big irregular patches

2.2.2.2 Brown Spot Symptoms:

- Initial lesions are water-soaked to greenish gray and later become grayish white with brown margin
- Lesions on leaf sheaths near waterline
- Presence of sclerotic
- Lesions may coalesce death of the whole leaf
- Partially filled or empty grains

2.2.2.3 Narrow Brown Spot Symptoms:

- Short, narrow, elliptical to linear brown lesions usually on leaf blades but may also occur on leaf sheaths, pedicels, and glumes or rice hulls
- Lesions about 2-10 mm long and 1 mm wide
- Lesions narrower, shorter, and darker brown on resistant varieties
- Lesions wider and lighter brown with gray necrotic centers on susceptible varieties
- Leaf necrosis may also occur on susceptible varieties
- Lesions occur in large numbers during the later growth stages.

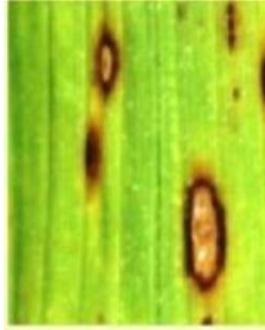
Common Name	Scientific Name	Image	Description	Remedy
Paddy Blast	Pyricularia grisea		Black variations are seen in plant and they begin to break.	Seeds are to be treated with Vitavax power with a volume of 2g.
Brown Spot	Bipolaris oryzae		Dark reddish margins are formed in plants leading to blackening of seeds.	Seeds are to be treated with Vitavax power with a volume of 2g.
Narrow Brown Spot	Xanthomonas Campestrisoryzae pv. oryzae		Yellow color legions appear on leaf	Seeds are to be treated with plantomycin 10g

Table 1: Disease of Rice – Sample Dataset

2.3 Case Study on Existing System:

An examination led by Kurniawati et al. from UniversityKebangsaan Malaysia means to build up a model framework to consequently and effectively recognize and characterize the paddy diseases with Blast Disease (BD), Brown Spot Disease (BSD), and Narrow Brown Spot Disease (NBSD) utilizing picture preparing system as an option or supplemental to the conventional manual technique.

In the paper,Batule et al. from Trinity College of Engineering and Research, Pune, Trinity College of Engineering and Research, Pune, Maharashtra, India gave a method to detect the disease

caused to the leaf calculating the RGB and HSV values. Primarily the image is blurred in order reduce noise. Then the image is converted from RGB to HSV form, after this color thresholding is done. After thresholding foreground or background detection is performed. Background detection leads to feature extractions of the leaf. Then k-means algorithm is applied which can help to clot the clusters. The following system is a software based solution for detecting the disease with which the leaf is infected.

In the paper, R.Preethiet al. from Panimalar Engineering College, Chennai, Tamilnadu-123, (India) proposed a system which will automatically detect the symptoms of diseases as soon as they appear on plant leaves. These images are made to undergo a set of pre-processing methods for image enhancement. Later, a satisfying set of visual features from the region of interest are extracted by applying histogram for detecting diseases accurately. The advisory helps farming community in effective decision making to protect their crop from diseases and increase its productivity.

In the paper, Phadikar and Sil from Dept. of CSE, West Bengal University of Technology, Kolkata700064, India, described a software prototype system for rice disease detection based on the infected images of various rice plants. Images of the infected rice plants are captured by digital camera and processed using image growing, image segmentation techniques to detect infected parts of the plants. Then the infected part of the leaf has been used for the classification purpose using artificial neural network. The methods evolved in this system are both image processing and soft computing technique applied on number of diseased rice plants.

In the paper, Paul and Sharma, Department of Electronics and Telecommunication, Bhilai Institute of Technology, Durg, India, evaluated a software solution for fast, accurate and automatic detection of plant diseases through Image Processing. Identification of the plant diseases is the key to preventing losses in the quality and quantity of the agricultural product. Health monitoring and disease detection of plant is critical for sustainable agriculture. The typical method of studying plant disease is to rely on visually observable patterns on the plant leaves. Visually identifying plant diseases is inefficient, difficult, time consuming, requires expertise in plant diseases and continuous monitoring which might be expensive in large farms. Therefore; a fast, automatic and accurate method to detect plant disease is of great importance. Hence, image processing technique is employed for the detection of plant diseases. The implementation of these technologies will lead to improved productivity.[2]

2.3.1 Conclusion:

This thesis presented the common method for detecting paddy disease. By previewing various method, we learned advantage and disadvantage of various method and their characteristic for simple and clean paddy disease detection.



Figure 2.1 : Block Diagram for Farmer's portal.

2.4 Disadvantages of existing System:

- The excessive use of chemicals by the help of machines reduces the fertility of the land.
- Lack of practical knowledge the farmers can't handle the machines properly.
- While the cost of maintenance is very high.
- Overuse of machines may lead to environmental damage.
- It is efficient but has many side effects and drawbacks.
- Furthermore, Driverless agriculture machine is a liability to access the technology.
- The robotic machine could not change their culture, we have to set their programme manually.
- Most of the farmers are illiterates so they are unable to use the modern machines.[3]

2.5 Proposed Methodology:

2.5.1 Introduction:

Method, technique or approach that has been used while designing and implementing the thesis are included. It also explains about the justification of method or approach used and hardware and software necessity.

2.5.2 Work Flow:

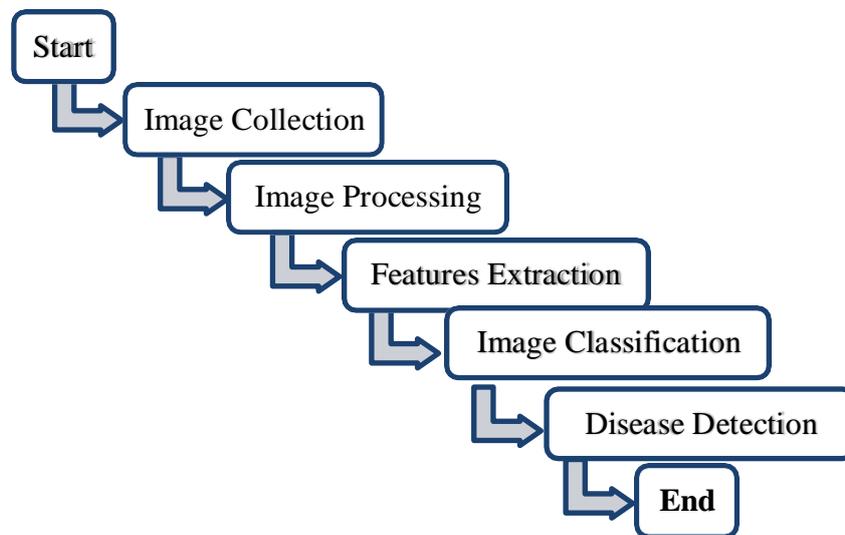


Figure 2.2: Work Flow of proposed methodology [2]

2.5.2.1 Image Collection:

The RGB images of paddy leaf are collected from Internet. Those image cropped into a smaller image with dimension of 64 x 64 pixels as training data. We have collected about 180 data samples with the four rotation from each images. It consists of three types of paddy diseases (Paddy Blast, Brown Spot, Narrow Brown Spot) as shown in Fig. 3.2. Images are stored in jpg format.

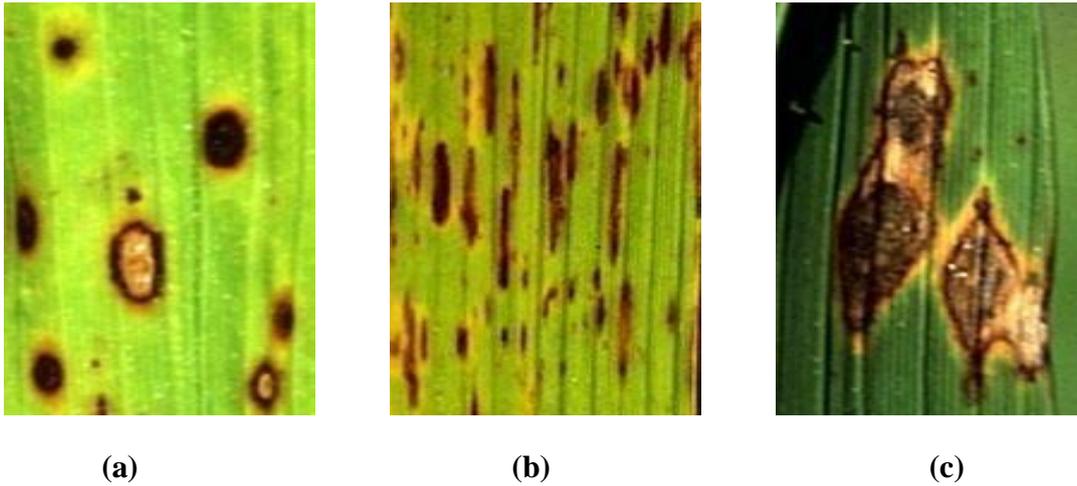


Figure: Sample of collected images (a) Brown Spot Disease; (b) Narrow Brown Spot Disease; (c) Blast Disease

2.5.2.2 Image Processing:

The main objective of this process is to obtain an image with an approximation of human color perception. The RGB image (Fig. 3.4(a)) is converted into Lab as abbreviation for CIEL*a*b* 1976 color space (also CIELAB), as shown in Fig. 3.4(b).

Lab Color Space:

The LAB color model is a three axis color system and LAB colors are absolute, meaning that the color is exact. It's what's known as device independent; meaning that the LAB color space is the only way to communicate different colors across different devices. An object's color is measured in LAB color with a spectrophotometer.

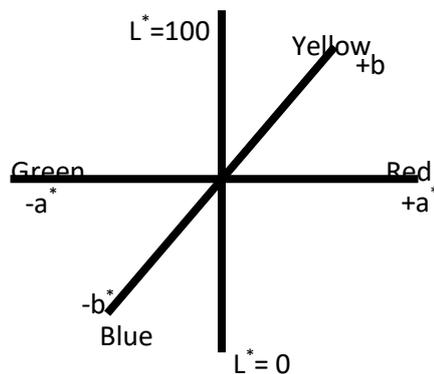


Figure 2.3: L*a*b* Color Space in Dimensional Graph

These three coordinates of CIELAB (Fig 3.3) represent-

- The lightness of the color $L^* = 0$ yields black and $L^* = 100$ indicates diffuse white; specular white may be higher
- Its position between red/magenta and green (a^* , negative values indicate green while positive values indicate magenta) and
- Its position between yellow and blue (b^* , negative values indicate blue and positive values indicate yellow)

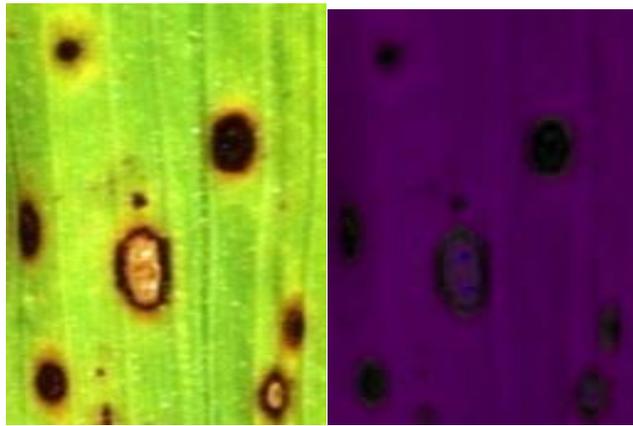


Figure 2.4: Processing image from RGB to Lab (a) RGB image; (b) Lab image

2.5.2.3 Feature Extraction:

Feature Extraction a sort of dimensionality lessening that productively speaks to intriguing parts of a picture as a smaller component vector. Features are extracted from the color co-occurrence matrix which is calculated previously. [2]

2.5.2.4 Image Classification:

After extracting features from the images, now a classifier is needed to classify the images. Here an artificial neural network with three hidden layer is used as a classifier. In the classifier two steps are followed. If an image does not pass leaf color analysis, classifier algorithm will be used to detect the diseases.

Leaf Color Analysis:

First the whole image is scanned through and calculate the minimum and maximum value for each channel. The RGB calculation will be passed.

$$93 \leq R_{min} \leq 211 \& 93 \leq R_{max} \leq 211$$

$$142 \leq G_{min} \leq 222 \& 142 \leq G_{max} \leq 222$$

$$64 \leq B_{min} \leq 155 \& 64 \leq B_{max} \leq 155$$

If an image passes all the above conditions, then the image is normal leaf image. Otherwise, it is an affected image.

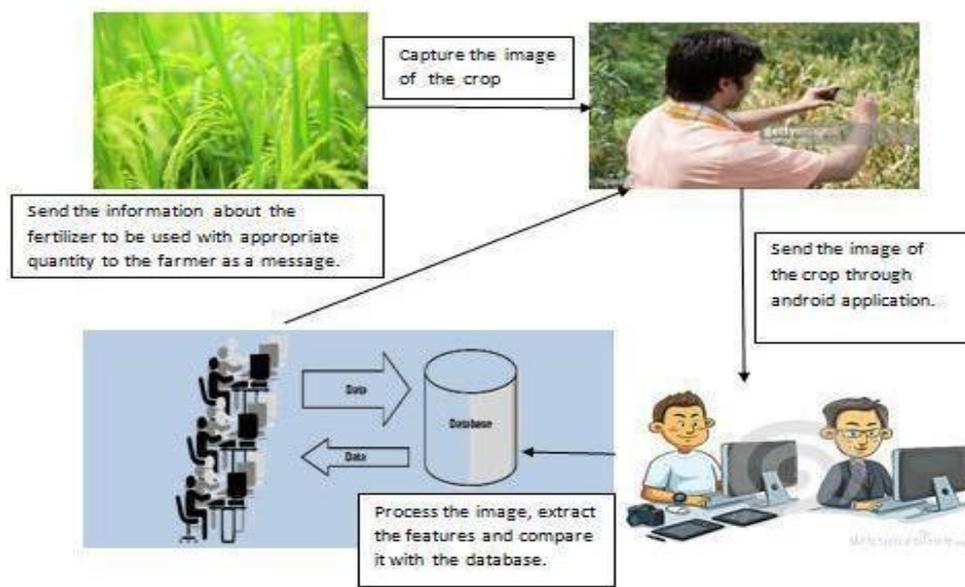


Figure 2.5: Fertilization Management for crops.

2.6 Advantages of Proposed Methodology:

- Modern machines can control the efforts of farmers.
- They reduce the time
- .Used supply water to the crops.
- They increase the price and demand of the products.
- Better marketing and exposure to the price
- .Facilities in online trading and E-Commerce.
- Further, improve the fertility of the soil.
- Decrease the use of water, Fertilizers which keeps the prices down.
- Low run of chemicals and also waste materials into seas and water.
- Reduce impact on the ecosystem.

3. SYSTEM DESIGN

3.1 System Architecture:

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. A system architecture can consist of system components and the sub-systems developed, that will work together to implement the overall system. There have been efforts to formalize languages to describe system architecture collectively these are called architecture description languages.

3.2 Architecture Diagram:

Software architecture refers to the high-level structures of a software system and the discipline of creating such structures and systems. Each structure comprises software elements, relations among them, and properties of both elements and relations. The architecture of a software system is a metaphor, analogous to the architecture of a building. It functions as a blueprint for the system and the developing project, laying out the tasks necessary to be executed by the design teams [4].

Software architecture is about making fundamental structural choices that are costly to change once implemented. Software architecture choices include specific structural options from possibilities in the design of the software. For example, the systems that controlled the space shuttle launch vehicle had the requirement of being very fast and very reliable. Therefore, an appropriate real-time computing language would need to be chosen. Additionally, to satisfy the need for reliability the choice could be made to have multiple redundant and independently produced copies of the program, and to run these copies on independent hardware while cross-checking results.

3.2.1 Levels of Abstractions:

Architecture is a coherent set of concepts for a structure. These concepts are often visualized at four levels of abstraction. These are:

- Conceptual Level - showing an overview of concepts
- Logical Level - showing a logical design of one or more concepts, containing at least the key elements of concepts and showing the principles of the concepts (i.e. how the concepts work).
- Physical Level - showing a component design depicting the elements
- Implementation Level - showing the vendors and products with which the components will be implemented.

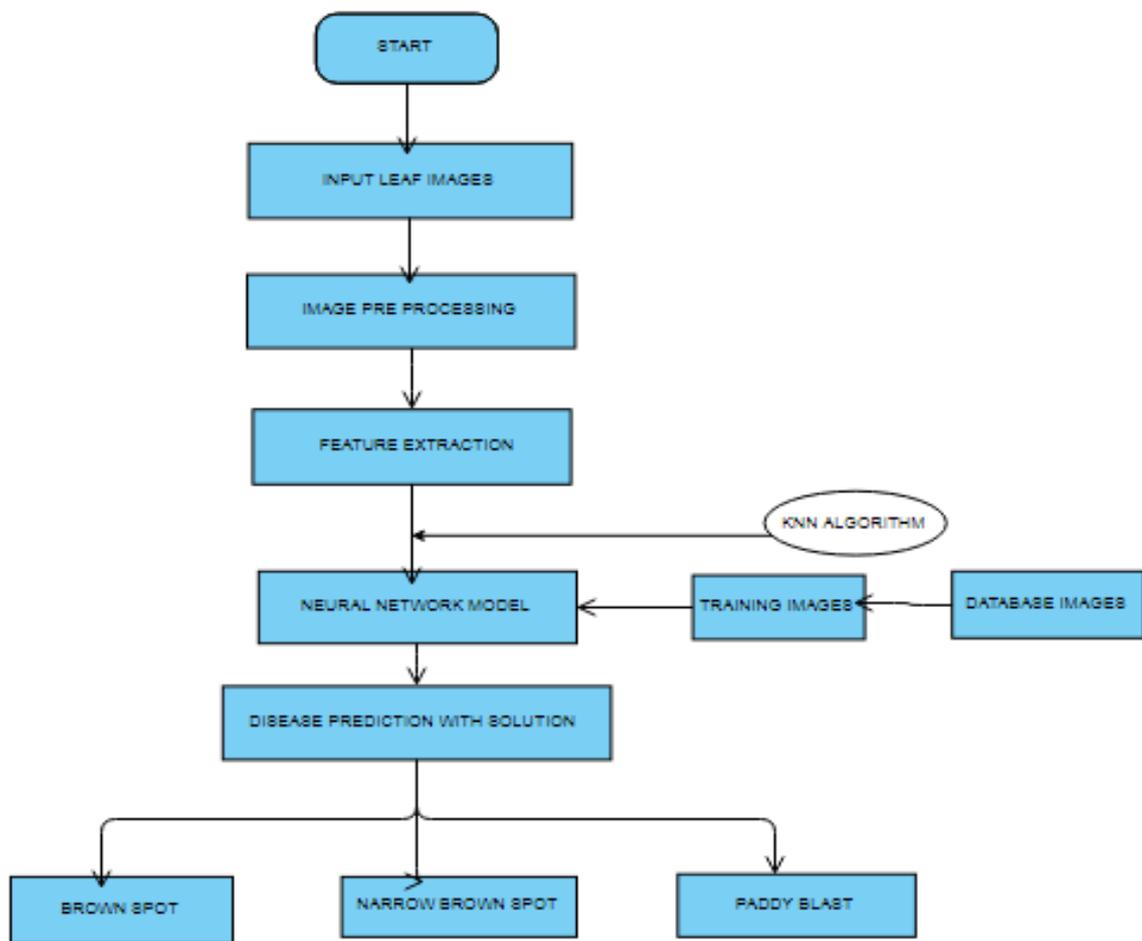


Figure 3 : System architecture

3.3 Requirement Specification:

3.3.1 Functional Requirements:

Functional requirements define the internal workings of the software: that is, the technical details, data manipulation and processing and other specific functionality that show how the use cases are to be satisfied. They are supported by non-functional requirements, which impose constraints on the design or implementation.

3.3.2 Non-Functional Requirements:

Non-functional requirements are requirements which specify criteria that can be used to judge the operation of a system, rather than specific behaviors. This should be contrasted with functional requirements that specify specific behavior or functions. Typical non-functional requirements are reliability, scalability, and cost. Non-functional requirements are often called theilities of a system. Other terms for non-functional requirements are "constraints", "quality attributes" and "quality of service requirements".

- **Reliability:** If any exceptions occur during the execution of the software it should be caught and thereby prevent the system from crashing.
- **Scalability:** The system should be developed in such a way that new modules and functionalities can be added, thereby facilitating system evolution.
- **Cost:** The cost should be low because a free availability of software package.

3.3.3 Software Requirements:

Programming Language : Python
Operating system : Windows 10 (64-bit)
IDE : Python IDLE
Tools : OpenCV

3.3.4 Hardware Requirements:

Processor : Intel i3
Hard Disk : 1TB
RAM : 8GB

3.4 UML Diagrams:

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed and was created by, the Object Management Group [5].

The goal is for UML to become a common language for creating models of object-oriented computer software. In its current form, UML is comprised of two major components: A Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of a software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing object-oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

GOALS:

The Primary goals in the design of the UML are as follows:

1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Support higher level development concepts such as collaborations, frameworks, patterns, and components.
6. Integrate best practices.

3.4.1 Class Diagram:

The class diagram is the main building block of object oriented modeling. It is used both for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. The classes in a class diagram represent both the main objects, interactions in the application and the classes to be programmed a class with three sections.

In the diagram, classes are represented with boxes which contain three parts:

- The upper part holds the name of the class.
- The middle part contains the attributes of the class.
- The bottom part gives the methods or operations the class can take or undertake.

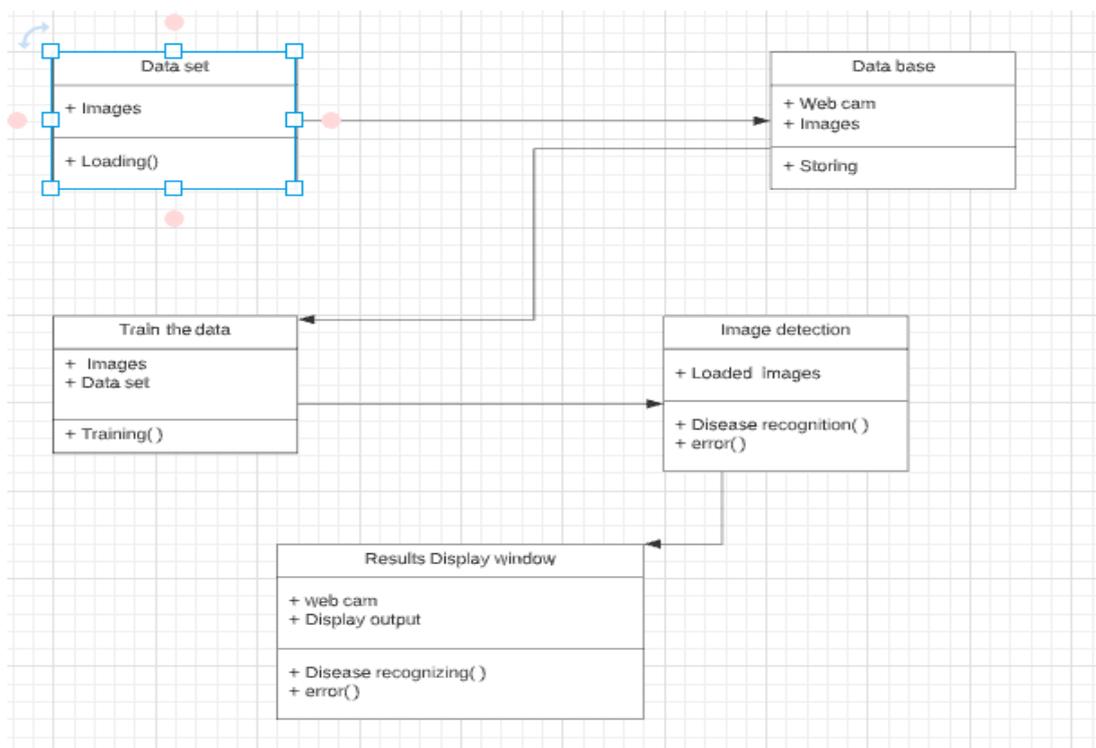


Figure 3.1: Class diagram for image detection

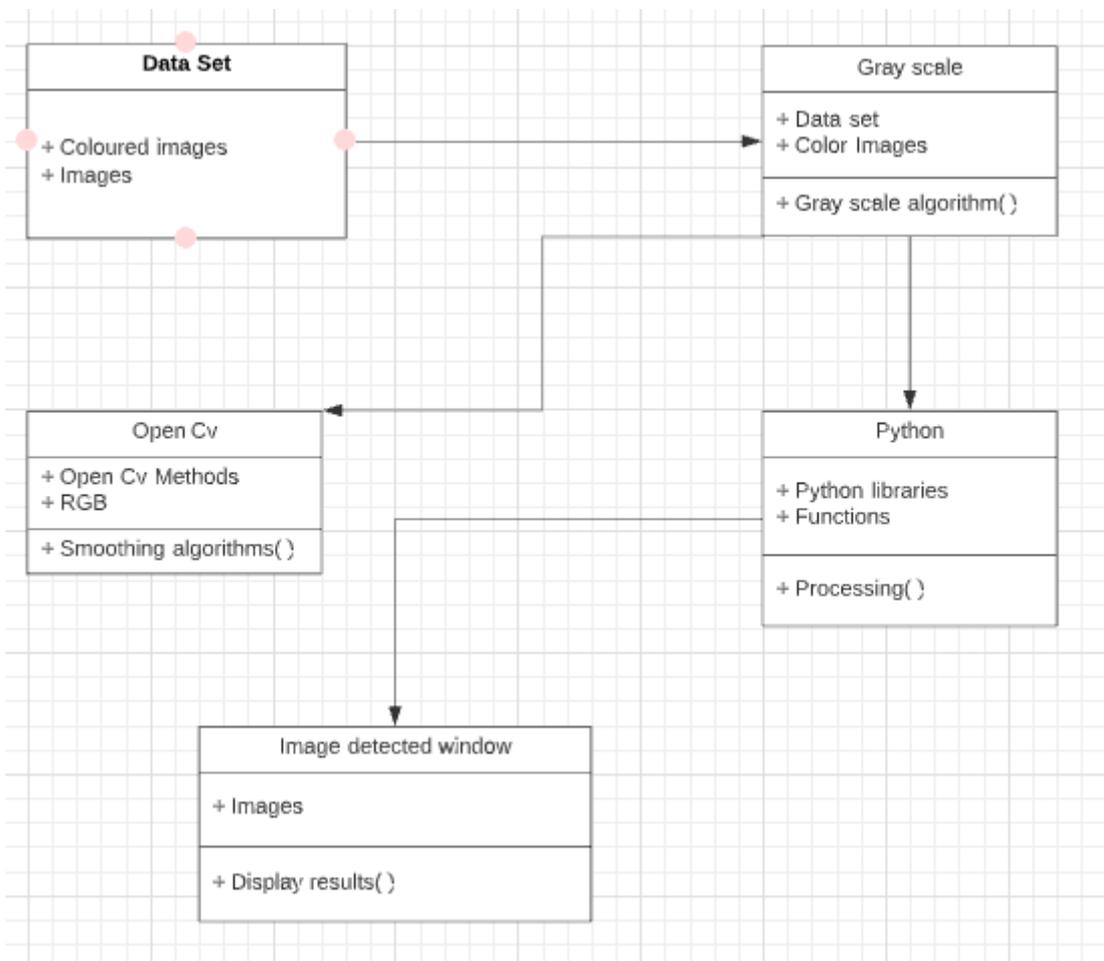


Figure 3.2: Class Diagram for disease detection using image processing

3.4.2 Use Case Diagram:

A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved [6]. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by other types of diagrams as well. The use Cases are represented either circle or ellipse.

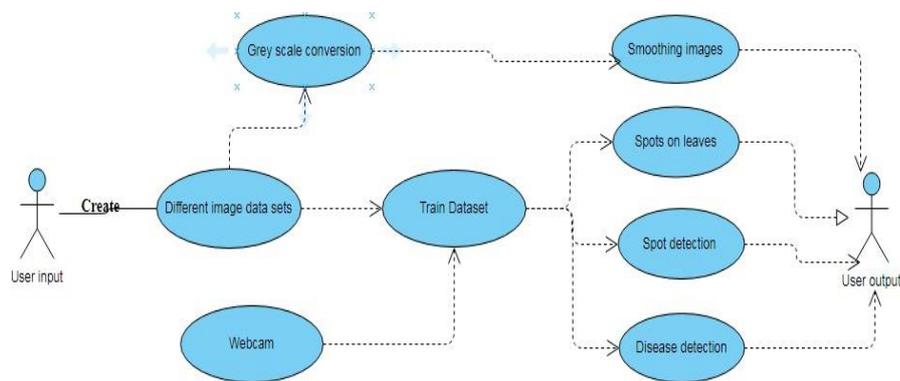


Figure 3.3: Use case diagram for image processing

3.4.3 Sequence Diagram:

A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios [7].

A sequence diagram shows, as parallel vertical lines (lifelines), different processes or objects that live simultaneously, and, as horizontal arrows, the messages exchanged between them, in the order in which they occur. This allows the specification of simple runtime scenarios in a graphical manner.

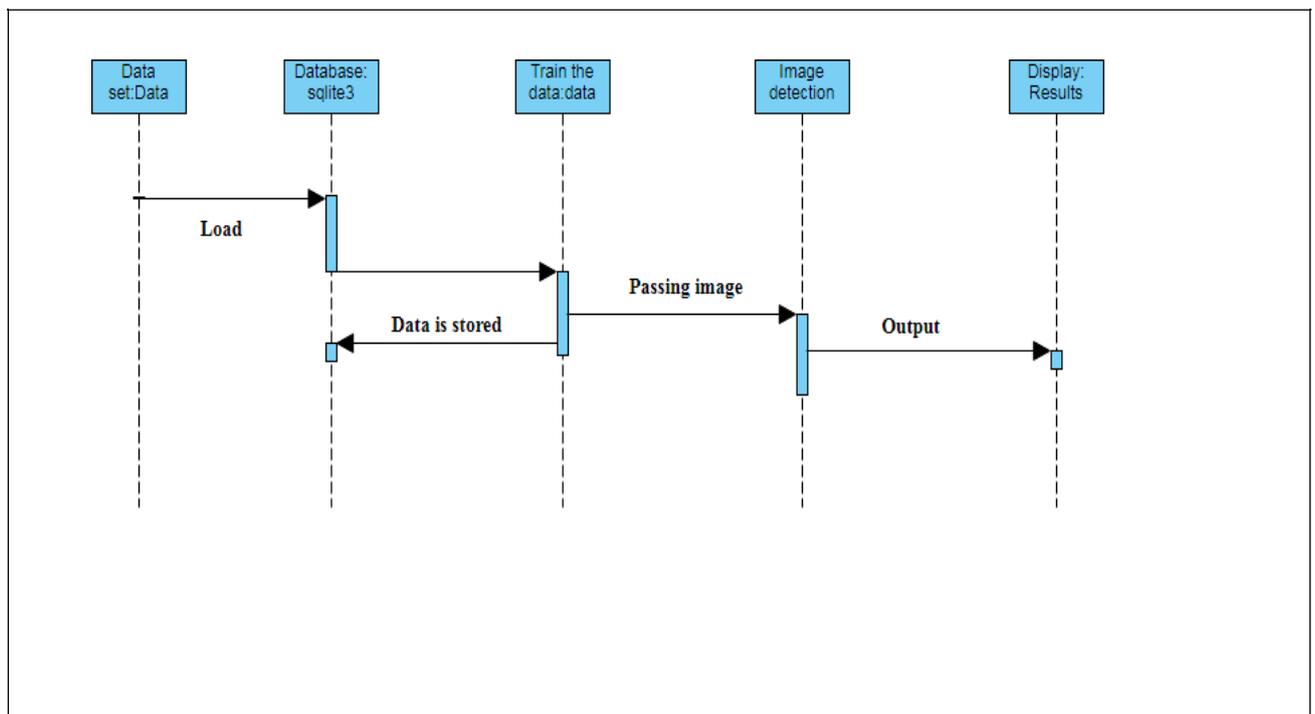


Figure 3.4: Sequence diagram for Image Detection

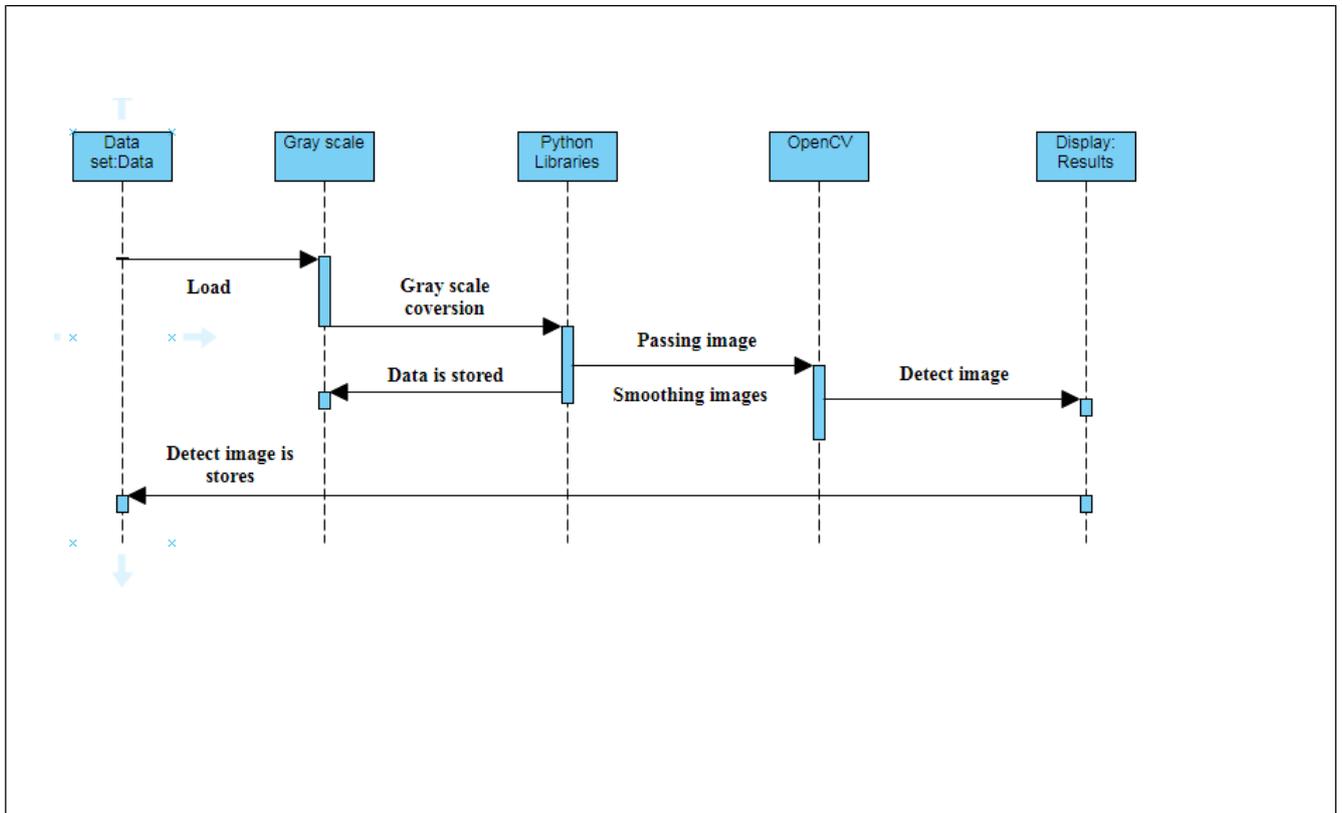


Figure 3.5: Sequence diagram for image detection using image processing

A collaboration diagram, also called a communication diagram or interaction diagram, is an illustration [7] of the relationships and interactions among software objects in the Unified Modeling Language (UML) technique.

3.4.4 Collaboration Diagram:

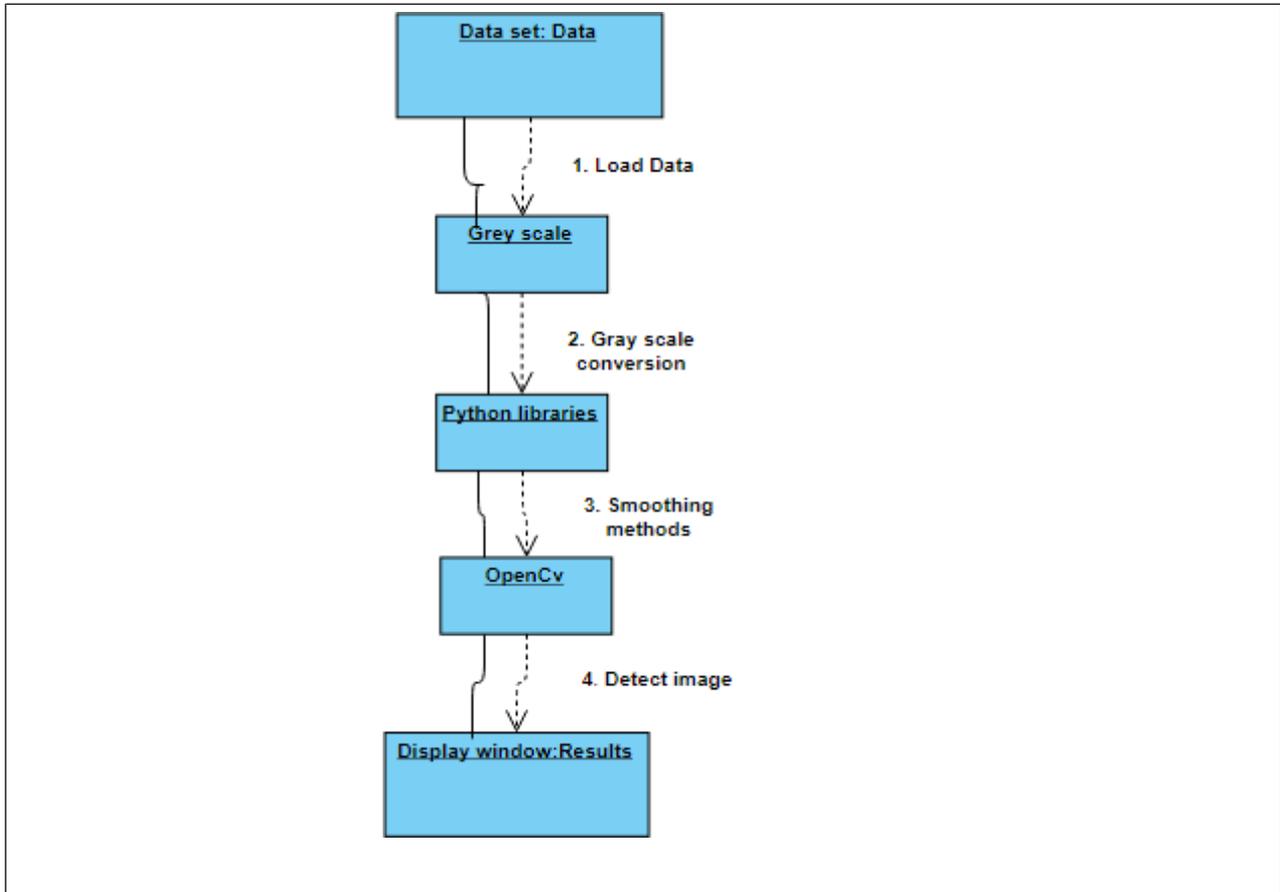


Figure 3.6: Collaboration diagram for image detection using image processing

3.4.5 Activity Diagram:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration, and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system [8]. An activity diagram shows the overall flow of control.

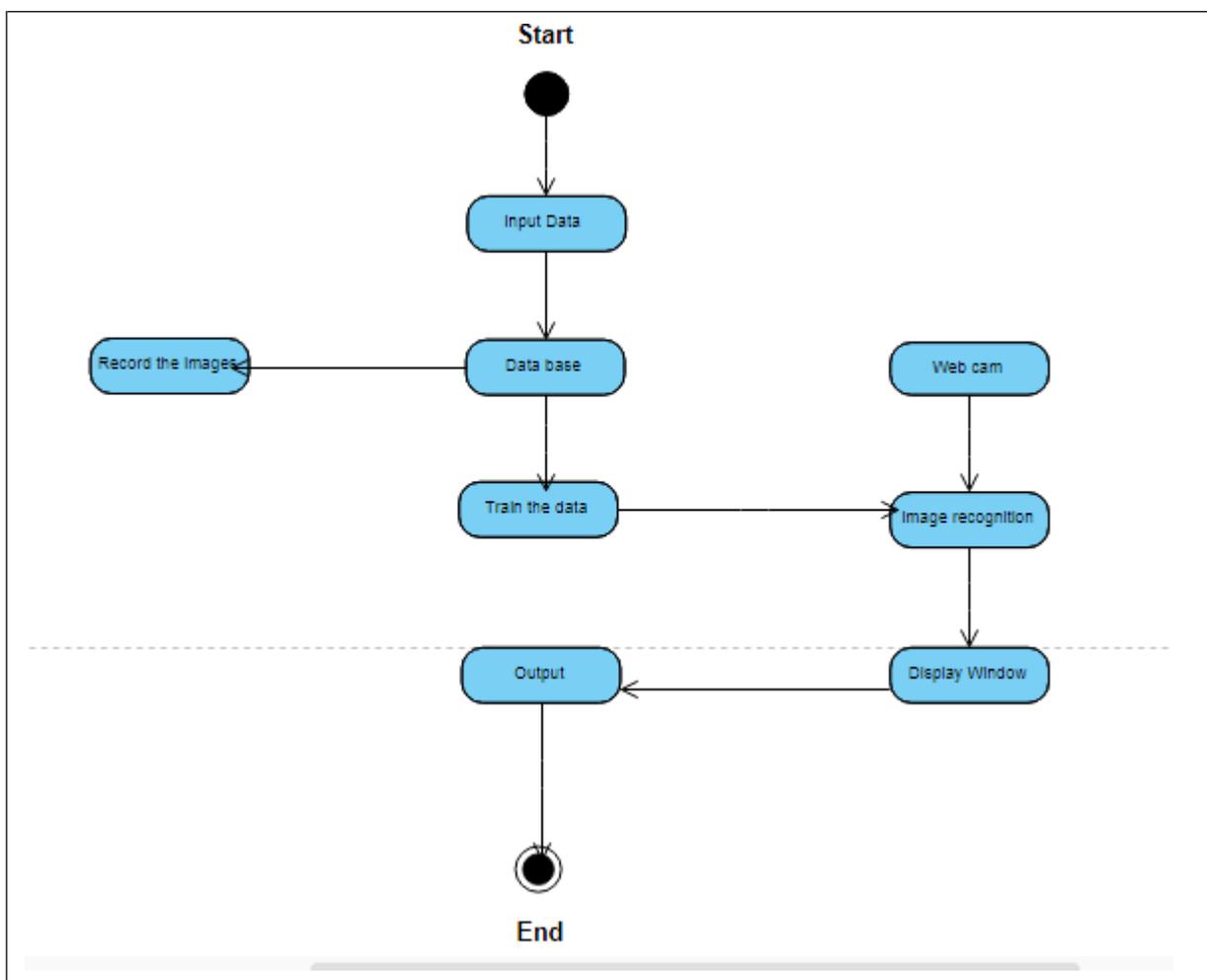


Figure 3.7: Activity diagram for Image Detection

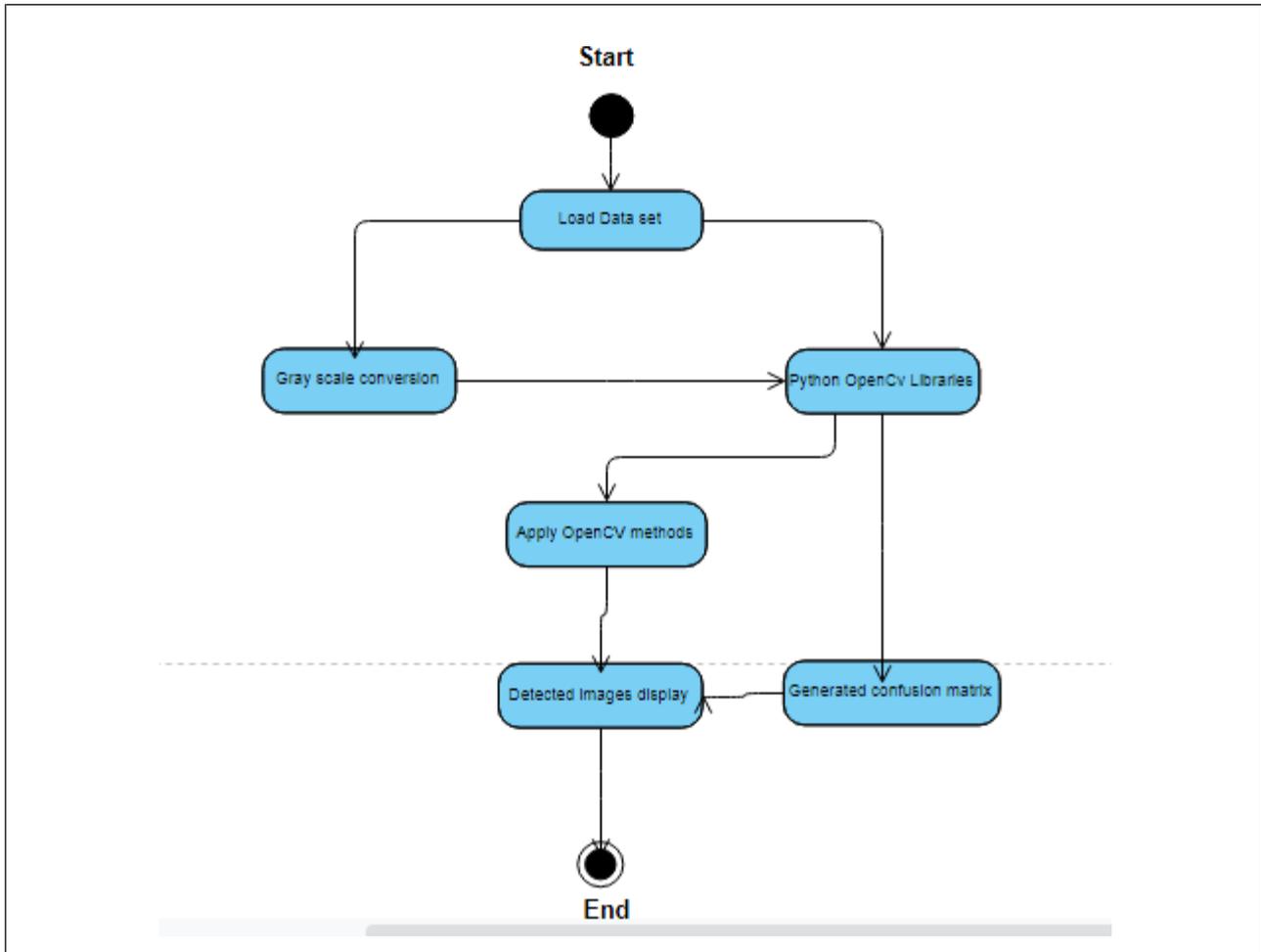


Figure 3.8 : Activity diagram for Image detection using image processing

4. IMAGE PROCESSING APPLICATION WITH ALGORITHM AND INSTALLATION

4.1 Image processing:

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image [9]. Usually Image Processing system include treating images as two-dimensional signals while applying already set signal processing methods to them.

It is among rapidly growing technologies today, with its applications in various aspects of a business. Image Processing forms core research area within engineering and computer science disciplines too.

4.1.1 Purpose of Image processing:

The purpose of image processing is divided into 5 groups. They are:

1. Visualization - Observe the objects that are not visible.
2. Image sharpening and restoration - To create a better image.
3. Image retrieval - Seek for the image of interest.
4. Measurement of pattern – Measures various objects in an image.
5. Image Recognition – Distinguish the objects in an image.

4.1.2 Types of image processing:

The two types of methods used for Image Processing are Analog and Digital Image Processing. Analog or visual techniques of image processing can be used for the hard copies like printouts and photographs. Image analysts use various fundamental tools of interpretation while using these visual techniques. The image processing is not just confined to area that has to be studied but on knowledge of analyst. Association is another important tool in image processing through visual techniques. So, analysts apply a combination of personal knowledge and collateral data to image processing.

Digital Processing techniques help in manipulation of the digital images by using computers. As raw data from imaging sensors from satellite platform contains deficiencies. To get over such flaws and to get originality of information, [9] it must undergo various phases of processing. The three general phases that all types of data must undergo while using digital technique are Pre- processing, enhancement and display, information extraction.

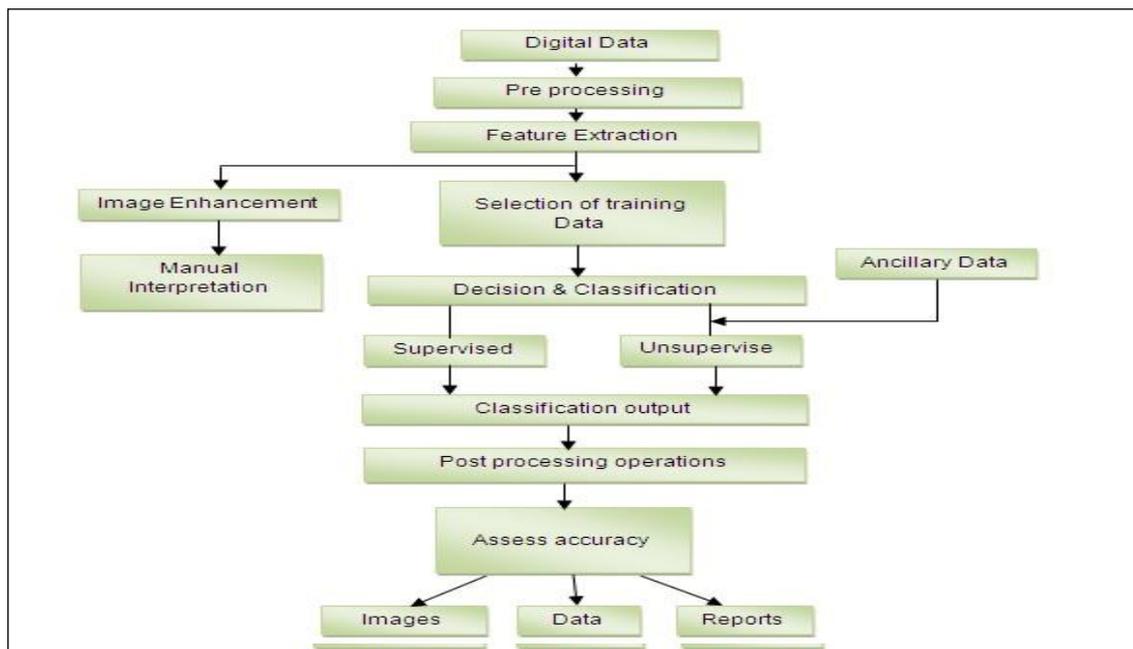


Figure 4.1:flow chart showing different phases in digital image processing [26]

4.1.3 K-Nearest Neighbor Algorithm:

The K-nearest neighbor (KNN) classifier is a non parametric classifier because it makes no underlying assumptions about the statistical structure of data. The KNN algorithm measures the distance between a test query features and a set of training data features that store in the database. The distance between these two feature vector is estimated using a distance function $d(x,y)$, where x, y are feature vector can be represents as

$$X = \{x_1, x_2, x_3, \dots\} \quad Y = \{y_1, y_2, y_3, \dots\}$$

The feature vectors must be normalized before classification algorithm run. The overall KNN algorithm is running in the following steps:

1. KNN algorithm uses training set that consist features and labeled classes store in database.
2. Calculate distance between test features and all training feature.
3. Sort the distance and determine k nearest neighbor.
4. Use simple majority of the category of nearest neighbor assign to the test.

The KNN classification algorithm is performed by using a training set which contains both the input feature and the labeled classes and then by comparing test feature with training feature a set of distance of the unknown K nearest neighbors determines. Finally test class assignment is done by either averaging the class numbers of the K nearest reference points or by obtaining a majority vote for them.

4.2 Smoothing Images:

- Smoothing, also called blurring, is a simple and frequently used image processing operation.
- There are many reasons for smoothing. In this we will focus on smoothing in order to reduce noise.
- To perform a smoothing operation we will apply a filter to our image. The most common type of filters are linear, in which an output pixel's value (i.e. $g(i,j)$) is determined as a weighted sum of input pixel values (i.e. $f(i+k,j+l)$) :

$$g(i,j) = \sum_{k,l} f(i+k,j+l)h(k,l)$$

$h(k,l)$ is called the kernel, which is nothing more than the coefficients of the filter.

It helps to visualize a filter as a window of coefficients sliding across the image.

4.2.1 2D Convolution (Image Filtering):

As for one-dimensional signals, images also can be filtered with various low-pass filters (LPF), high-pass filters (HPF), etc. A LPF helps in removing noise, or blurring the image. A HPF filters helps in finding edges in an image.

OpenCV provides a function, `cv2.filter2D()`, to convolve a kernel with an image. As an example, we will try an averaging filter on an image. A 5x5 averaging filter kernel can be defined as follows:

$$K = \frac{1}{25} \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

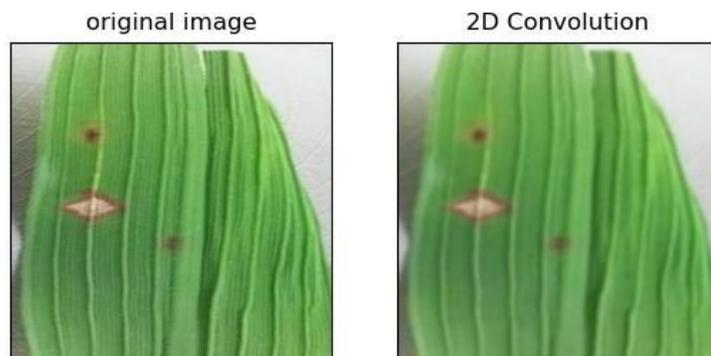
Filtering with the above kernel results in the following being performed: for each pixel, a 5x5 window is centered on this pixel, all pixels falling within this window are summed up, and the result is then divided by 25. This equates to computing the average of the pixel values inside that window. This operation is performed for all the pixels in the image to produce the output filtered image. Try this code and check the result:

```
import cv2
import numpy as np
from matplotlib import pyplot as plt

img = cv2.imread('opencv_logo.png')

kernel = np.ones((5,5),np.float32)/25
dst = cv2.filter2D(img,-1,kernel)

plt.subplot(121),plt.imshow(img),plt.title('Original')
plt.xticks([], plt.yticks([]))
plt.subplot(122),plt.imshow(dst),plt.title('Averaging')
plt.xticks([], plt.yticks([]))
plt.show()
```

Result:

4.2.2 Image Blurring (Image Smoothing):

Image blurring is achieved by convolving the image with a low-pass filter kernel. It is useful for removing noise. It actually removes high frequency content (e.g: noise, edges) from the image resulting in edges being blurred when this is filter is applied. (Well, there are blurring techniques which do not blur edges). OpenCV provides mainly four types of blurring techniques.

4.2.2.1 Gaussian Filtering:

Probably the most useful filter (although not the fastest). Gaussian filtering is done by convolving each point in the input array with a *Gaussian kernel* and then summing them all to produce the output array. It is done with the function, `cv2.GaussianBlur()`. We should specify the width and height of the kernel which should be positive and odd. We also should specify the standard deviation in the X and Y directions, `sigmaX` and `sigmaY` respectively. If only `sigmaX` is specified, `sigmaY` is taken as equal to `sigmaX`. If both are given as zeros, they are calculated from the kernel size. Gaussian filtering is highly effective in removing Gaussian noise from the image.

Probably the most useful filter (although not the fastest). Gaussian filtering is done by convolving each point in the input array with a *Gaussian kernel* and then summing them all to produce the output array.

The Gaussian distribution in 1-D has the form:

$$G(x) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{x^2}{2\sigma^2}}$$

where σ is the standard deviation of the distribution. We have also assumed that the distribution has a mean of zero (*i.e.* it is centered on the line $x=0$). The distribution is illustrated in Figure 4.2.

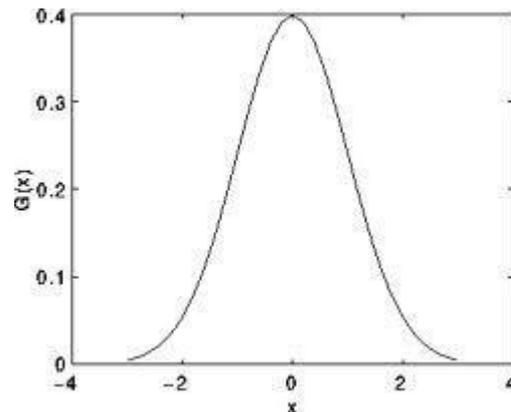


Figure 4.2: 1-D Gaussian distribution with mean 0 and $\sigma = 1$

Assuming that an image is 1D, you can notice that the pixel located in the middle would have the biggest weight. The weight of its neighbors decreases as the spatial distance between them and the center pixel increases.

In 2-D, an isotropic (*i.e.* circularly symmetric) Gaussian has the form:

$$G(x, y) = \frac{1}{2\pi\sigma^2} e^{-\frac{x^2+y^2}{2\sigma^2}}$$

This distribution is shown in Figure 4.3

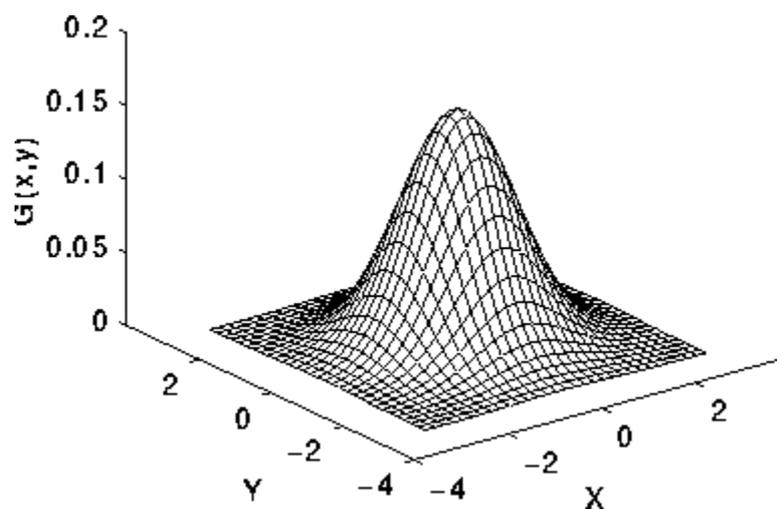
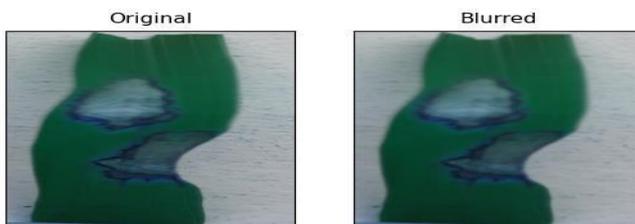


Figure 4.3: 2-D Gaussian distribution with mean (0,0) and $\sigma = 1$

The Gaussian function is used in numerous research areas:

- It defines a probability distribution for noise or data.
- It is a smoothing operator.
- It is used in mathematics.

```
import cv2
import numpy as np
from matplotlib import pyplot as plt
img = cv2.imread('opencv_logo.png')
blur = cv2.GaussianBlur(img,(5,5),0)
plt.subplot(121),plt.imshow(img),plt.title('Original')
plt.xticks([], plt.yticks([]))
plt.subplot(122),plt.imshow(blur),plt.title('Blurred')
plt.xticks([], plt.yticks([]))
plt.show()
```

Result:

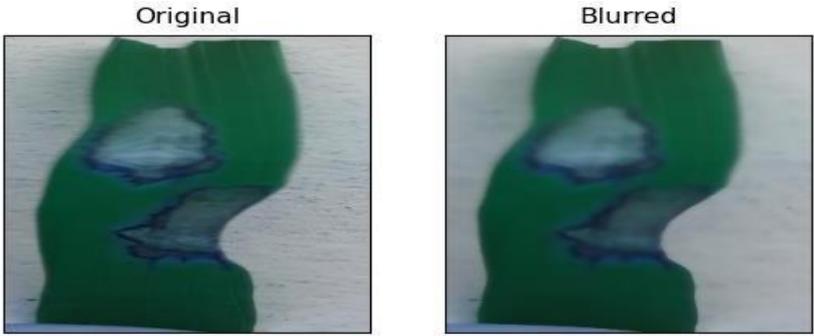
4.2.2.3 Bilateral Filter:

This is not the case for the bilateral filter, `cv2.bilateralFilter()`, which was defined for, and is highly effective at noise removal while preserving edges. But the operation is slower compared to other filters. We already saw that a Gaussian filter takes the a neighborhood around the pixel and finds its Gaussian weighted average. This Gaussian filter is a function of space alone, that is, nearby pixels are considered while filtering. It does not consider whether pixels have almost the same intensity value and does not consider whether the pixel lies on an edge or not. The resulting effect is that Gaussian filters tend to blur edges, which is undesirable.

The bilateral filter also uses a Gaussian filter in the space domain, but it also uses one more (multiplicative) Gaussian filter component which is a function of pixel intensity differences. The Gaussian function of space makes sure that only pixels are ‘spatial neighbors’ are considered for filtering, while the Gaussian component applied in the intensity domain (a Gaussian function of intensity differences) ensures that only those pixels with intensities similar to that of the central pixel (‘intensity neighbors’) are included to compute the blurred intensity value. As a result, this method preserves edges, since for pixels lying near edges, neighboring pixels placed on the other side of the edge, and therefore exhibiting large intensity variations when compared to the central pixel, will not be included for blurring.

```
import cv2
import numpy as np
from matplotlib import pyplot as plt
img = cv2.imread('opencv_logo.png')
blur = cv2.bilateralFilter(img,9,75,75)
plt.subplot(121),plt.imshow(img),plt.title('Original')
plt.xticks([], plt.yticks([]))
plt.subplot(122),plt.imshow(blur),plt.title('Blurred')
plt.xticks([], plt.yticks([]))
plt.show()
```

Result:



4.2.3 Applications of Image Processing:

1. Biomedical Imaging techniques:

For medical diagnosis, different types of imaging tools such as X- ray, Ultrasound, computer aided tomography (CT) etc are used.

2. Robot vision:

There are several robotic machines which work on the digital image processing. Through image processing technique robot finds their ways, for example, hurdle detection robot and line follower robot.

3. Pattern recognition:

It involves the study of image processing, it is also combined with artificial intelligence such that computer-aided diagnosis, handwriting recognition and images recognition can be easily implemented. Now a days, image processing is used for pattern recognition.

4. Video processing:

It is also one of the applications of digital image processing. A collection of frames or pictures are arranged in such a way that it makes the fast movement of pictures. It involves frame rate conversion, motion detection, reduction of noise and colour space conversion etc.

5. Moving object tracking:

This application enables to measure motion parameters and acquire visual record of the moving object. The different types of approach to track an object are Motion based tracking and Recognition based tracking.

4.2.4 Converting an image to gray scale:

Need of Converting an image to grayscale image Initially it preprocess the input image and reduces the noise on the image to identify edges on the images.

Let us look into how to convert an image into gray scale image:

Step1.Install Opencv-Python in PC and also need to install Numpy, which can be done with pip, the Python package manager, by sending the following command on the command line:

pip install numpy

1.pip install opencv-python

To get started, we need to import the **cv2** module, which will make available the functionalities needed to read the original image and to convert it to gray scale.

1.import cv2

To read the original image, simply call the **imread** function of the **cv2** module, passing as input the path to the image, as a string.

For simplicity, we are assuming the file exists and everything loads fine, so we will not be doing any error check. Nonetheless, for a robust code, you should handle these type of situations.

As additional note, which will be important for the conversion to gray scale, the **imread** function will have the channels stored in **BGR** (Blue, Green and Red) order by default

Next, we need to convert the image to gray scale. To do it, we need to call the cvtColor function, which allows to convert the image from a color space to another.

As first input, this function receives the original image. As second input, it receives the color space conversion code. Since we want to convert our original image from the **BGR** color space to **gray**, we use the code **COLOR_BGR2GRAY**.

2. import os,glob

from os import listdir,makedirs

from os.path import isfile,join

```

path =r ' C:\Users\DELL\Desktop\m project\images\test\blight diseases' # Source Folder
dstpath = r' C:\Users\DELL\Desktop\m project\images\train' # Destination Folder

```

```

try:

```

```

    makedirs(dstpath)

```

```

except:

```

```

    print ("Directory already exist, images will be written in same folder")

```

```

# Folder won't used

```

```

files = [f for f in listdir(path) if isfile(join(path,f))]

```

```

for image in files:

```

```

    try:

```

```

        img = cv2.imread(os.path.join(path,image))

```

```

        gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)

```

```

dstPath = join(dstpath,image)

```

```

        cv2.imwrite(dstPath,gray)

```

```

    except:

```

```

        print ('{} is not converted'.format(image))

```

```

for fil in glob.glob('*.*jpg'):

```

```

    try:

```

```

        image = cv2.imread(fil)

```

```

        gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY) # convert to grayscale

```

```

        cv2.imwrite (os.path.join (dstpath,fil),gray_image)

```

```

    except:

```

```

        print('{} is not converted')

```

Output :- RGB Image



Grayscale Image



4.3 Python programming:

Python is an object-oriented, high-level programming language with integrated dynamic semantics primarily for web and app development. It is extremely attractive in the field of Rapid Application Development because it offers dynamic typing and dynamic binding options. Python is relatively simple, so it's easy to learn since it requires a unique syntax that focuses on readability. Developers can read and translate Python code much easier than other

One of the most promising benefits of Python is that both the standard library and the interpreter are available free of charge, in both binary and source form. There is no exclusivity either, as Python and all the necessary tools languages. In turn, this reduces the cost of program maintenance and development because it allows teams to work collaboratively without significant language and experience barriers [10].

Additionally, Python supports the use of modules and packages, which means that programs can be designed in a modular style and code can be reused across a variety of projects. Once you've developed a module or package you need, it can be scaled for use in other projects, and it's easy to import or export these modules. They are available on all major platforms [10]. Therefore, it is an enticing option for developers who don't want to worry about paying high development costs.

4.3.1 Installation of python:

(a) Installation of python in ubuntu:

python installation in Linux environment (Ubuntu) by default python 2.7 is installed. How to install python3 in ubuntu is given in below steps:

Step 1: Setting Up Python 3:

On Ubuntu 16.04, you can find the Terminal application by clicking on the Ubuntu icon in the upper-left hand corner of your screen and typing “terminal” into the search bar. Click on the Terminal application icon open it. Alternatively, you can hit the CTRL, ALT, and T keys on your keyboard at the same time to open the Terminal application automatically to

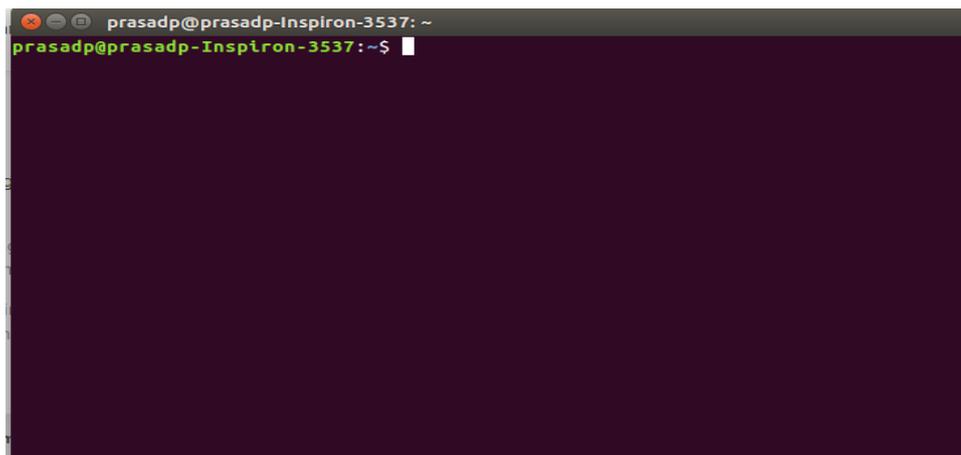


Figure 4.4: ubuntu terminal window

ubuntu 16.04 ships with both Python 3 and Python 2 pre-installed. To make sure that our versions are up-to-date, let's update and upgrade the system with apt-get:

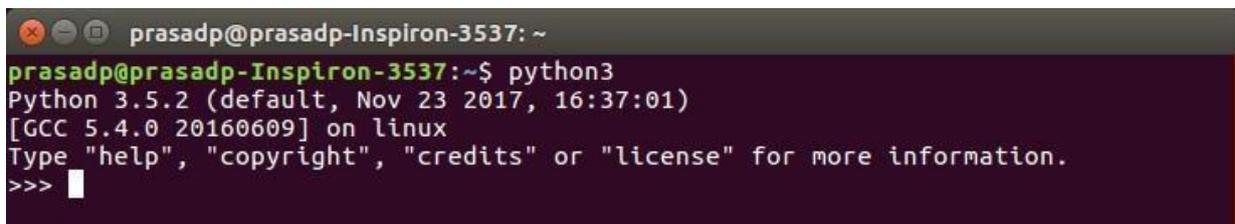
```
$ sudo apt-get update
```

```
$ sudo apt-get -y upgrade
```

The `-y` flag will confirm that we are agreeing for all items to be installed, but depending on your version of Linux, you may need to confirm additional prompts as your system updates and upgrades. Once the process is complete, we can check the version of Python 3 that is installed in the system by typing:

```
python --version
```

If you want to check specific version just type in terminal `python version`, if it available it will show else it shows error.

A screenshot of an Ubuntu terminal window. The window title is 'prasadb@prasadb-Inspiron-3537: ~'. The prompt is 'prasadb@prasadb-Inspiron-3537:~\$'. The command entered is 'python3'. The output is: 'Python 3.5.2 (default, Nov 23 2017, 16:37:01) [GCC 5.4.0 20160609] on linux Type "help", "copyright", "credits" or "license" for more information. >>>'.

```
prasadb@prasadb-Inspiron-3537: ~
prasadb@prasadb-Inspiron-3537:~$ python3
Python 3.5.2 (default, Nov 23 2017, 16:37:01)
[GCC 5.4.0 20160609] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

Figure 4.5: ubuntu terminal window

To manage software packages for Python, Install pip, pip is a package management system used to install and manage software packages written in Python. Many packages can be found in the default source for packages and their dependencies — Python Package Index (PyPI).

```
$ sudo apt-get install -y python3-pip
```

A tool for use with Python, **pip** installs and manages programming packages we may want to use in our development projects. You can install Python packages by typing:

```
$ pip3 install package_name
```

There are a few more packages and development tools to install to ensure that we have a robust set-up for our programming environment:

```
$ sudo apt-get install build-essential libssl-dev libffi-dev python-dev
```

Step 2: Setting Up a Virtual Environment:

Virtual you to have an isolated space on your computer for Python projects, ensuring that each of your projects can have its own set of dependencies that won't disrupt any of your other projects. Setting up a programming environment provides us with greater control over our Python projects and over how different versions of packages are handled. This is especially important when working with third-party packages.

You can set up as many Python programming environments as you want. Each environment is basically a directory or folder in your computer that has a few scripts in it to make it act as an environment. We need to first install the **venv** module, part of the standard Python 3 library, so that we can create virtual environments. Install **venv** by typing:

```
$ sudo apt-get install -y python3-venv
```

With this installed, we are ready to create environments. Let's choose which directory we would like to put our Python programming environments in, or we can create a new directory with `mkdir`, as in:

```
$ mkdir environments
```

```
$ cd environments
```

Once you are in the directory where you would like the environments to live, you can create an environment by running the following command:

```
$ python3 -m venv my_env
```

Essentially, this sets up a new directory that contains a few items which we can view with the following command:

```
$ ls my_env
```

To use this environment, you need to activate it, which you can do by typing the following command that calls the activate script:

```
$ source my_env/bin/activate
```

Your prompt will now be prefixed with the name of your environment, in this case it is called my_env. Your prefix may look somewhat different, but the name of your environment in parentheses should be the first thing you see on your line:

```
prasadp@prasadp-Inspiron-3537:~/environments$
```

(b) Installation of python in windows:

Step 1: Download the latest Python 3.x version. download x84-64 Executable file only as installer will automatically install 32-bit or 64-bit of python according to system configuration [11]



Figure 4.6: downloading process window of python in windows

Step 2: Open the executable file and check the Add Python 3.6 to PATH. Then click the Install Now button.

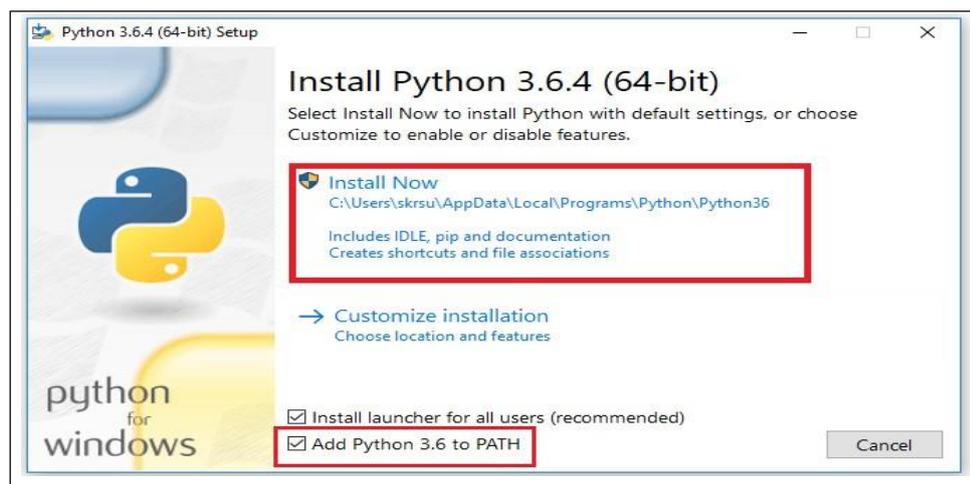


Figure 4.7: Installing python in windows

Step 3: When the installation progress is completed ,you will see the Disable path Length limit. This will remove the limitations on MAX_PATH variable. It will allow to use long path namesforthepython.Irecommendyouonottodisablethisoptionasitwillremoveanypath related issues while working on windows .Therefore click on the close button to finish the installation.

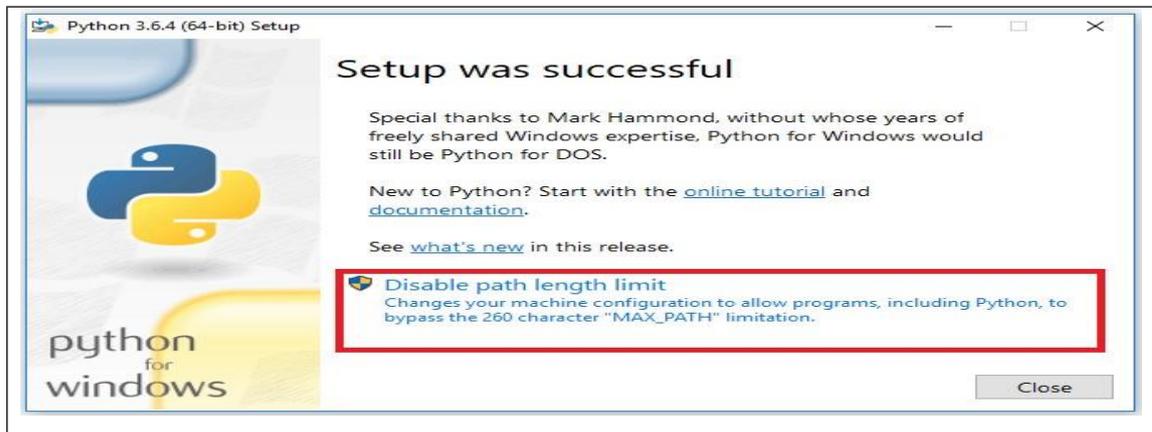


Figure 4.8: Setting path in python

Step 4: Now the Python 3.6 is installed. You can check it either it is properly installed or not.YoucandoitthroughCommandPrompt.Openthecommandprompt.OpentheCommand prompt and type the following command .it will output the version of thepython.

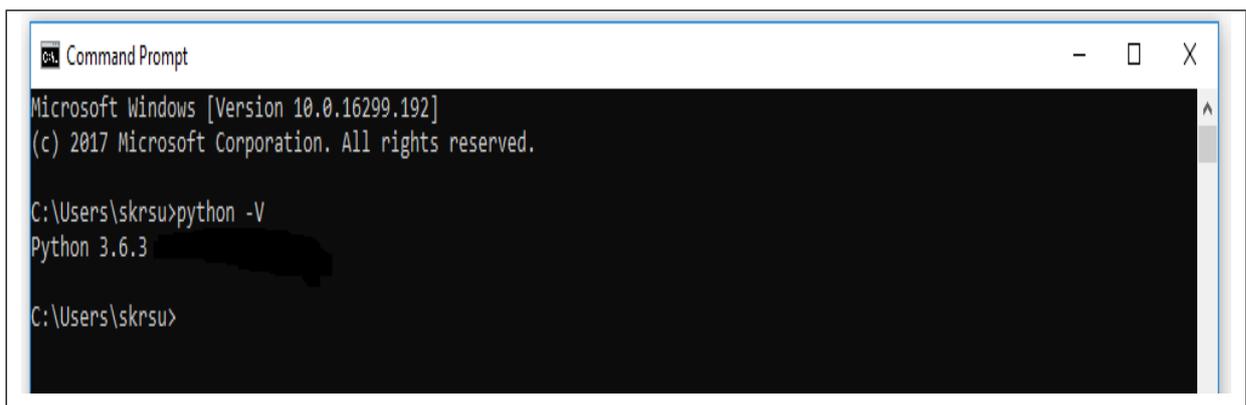


Figure 4.9: Command Prompt

4.3.2 Features and Applications of python:

(a) Features of python:

(1) **Easy-to-learn** – Python has few keywords, simple structure, and a clearly defined syntax. This allows the student to pick up the language quickly.

(2) **Easy-to-read** – Python code is more clearly defined and visible to the eyes.

(3) **Easy-to-maintain** – Python's source code is fairly easy-to-maintain.

(4) **Scalable** – Python provides a better structure and support for large programs than shell scripting.

(5) **Interactive Mode** – Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.

(6) **Portable** – Python can run on a wide variety of hardware platforms and has the same interface on all platforms.

(7) **Extendable** – You can add low-level modules to the Python interpreter. These modules enable programmers to add to or customize their tools to be more efficient.

(8) **GUI Programming** – Python supports GUI applications that can be created and ported to many system calls, libraries and window systems, such as Windows MFC, Macintosh, and the X Window system of Unix.

(b) Applications of Python:

1) Web Applications:

We can use Python to develop web applications. It provides libraries to handle internet protocols such as HTML and XML, JSON, Email processing, request, beautiful Soup, Feed parser etc. It also provides Frame works such as Django, Pyramid, Flask etc to design and develop web- based applications. Some important developments are: Python Wiki Engines, Poccoo , Python Blog Software etc [12].

2) Desktop GUI Applications:

Python provides Tk GUI library to develop user interface in python -based application. Some other useful toolkits wx Widgets, Kivy ,pyqt that are useable on several platforms. The Kivy is popular for writing multi touch applications.

3) Software Development:

Python is helpful for software development process. It works as a support language and can be used for build control and management, testing etc.

4) Scientific and Numeric:

Python is popular and widely used in scientific and numeric computing. Some useful library and package are SciPy, Pandas, IPython etc. s group of packages engineering, science and mathematics.

5) Business Applications:

Python is used to build Business applications like ERP and e-commerce systems. Tryton is a high -level application platform.

6) Console Based Application:

We can use Python to develop console- based applications. For example: **IPython**.

7) Audio or Video based Applications:

Python is awesome to perform multiple tasks and can be used to develop multimedia applications. Some of real applications are: TimPlayer, cplay etc.

8) 3D CAD Applications:

To create CAD application Fandango is a real application which provides full features of CAD.

9) Enterprise Applications:

Python can be used to create applications which can be used within an Enterprise or an Organization. Some real time applications are: OpenErp, Tryton, Picalo etc.

10) Applications for Images:

Using Python several applications can be developed for image. Applications developed are: VPython, Gogh, imgSeek etc.

4.3.3 Python libraries for Image processing:

1. NumPy:

Python NumPy (among other things) provides support for large ,multi-dimensional arrays. Using NumPy, we can express images as multi-dimensional arrays [13].

```
Pip install NumPy
```

2. PIL Now is PILLOW:

The Python Imaging Library or PIL allowed you to do image processing in Python.

```
Pip install Pillow
```

3. scikit-image:

scikit-image is a collection of algorithms for image processing . It includes algorithms for segmentation, geometric transformations, colour space manipulation, analysis, filtering, morphology, feature detection, and more. It is designed to interoperate with the Python numerical and scientific libraries NumPy and SciPy.

```
Pip install scikit-image
```

4. Matplotlib:

Matplotlib is a plotting library for the Python programming language and its numerical mathematics extension NumPy. It provides an object-oriented API for embedding plots into applications using general-purpose GUI toolkits like Tkinter, wxPython, Qt, or GTK+

```
Pip install Matplotlib
```

5. OpenCV (Open Source Computer Vision Library):

The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects ,classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects and many more.

Pip install OpenCV

4.4 Introduction to OpenCV:

OpenCV:

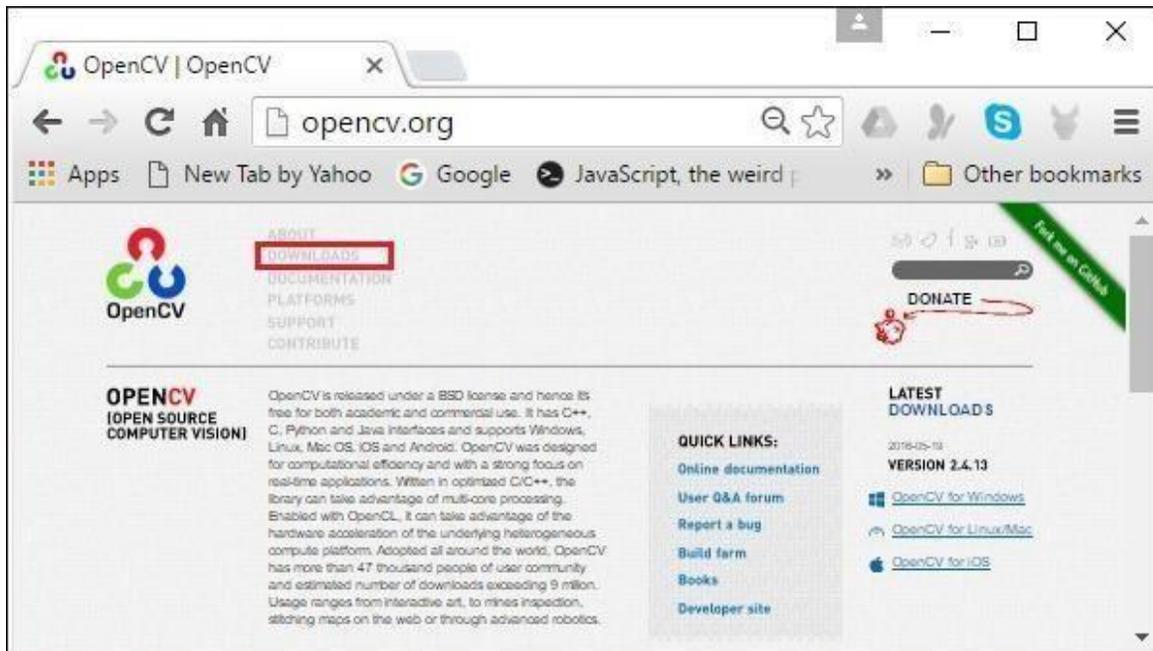
OpenCV (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in the commercial products. Being a BSD-licensed product, OpenCV makes it easy for businesses to utilize and modify the code.

The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high resolution image of an entire scene, find similar images from an image database, remove red eyes from images taken using flash, follow eye movements, recognize scenery and establish markers to overlay it with augmented reality, etc. OpenCV has more than 47 thousand people of user community and estimated number of downloads exceeding 14 million. The library is used extensively in companies, research groups and by governmental bodies.

Along with well-established companies like Google, Yahoo, Microsoft, Intel, IBM, Sony, Honda, Toyota that employ the library, there are many start-ups such as Applied Minds, VideoSurf, and Zeitera, that make extensive use of OpenCV. OpenCV's deployed uses span the range from stitching street view images together, detecting intrusions in surveillance video in Israel, monitoring mine equipment in China, helping robots navigate and pick up objects at Willow Garage, detection of swimming pool drowning accidents in Europe, running interactive art in Spain and New York, checking runways for debris in Turkey, inspecting labels on products in factories around the world on to rapid face detection in Japan.

4.4.1 Installing OpenCV:

(a) Installing OpenCV in windows:



Step 1 – Open the homepage of **OpenCV** by clicking the following link: <http://opencv.org/>

Figure: 4.10 : installing OpenCV in windows 10

Step 2 – Now, click the Downloads link highlighted in the above screenshot. On clicking, you will be directed to the downloads page of OpenCV.

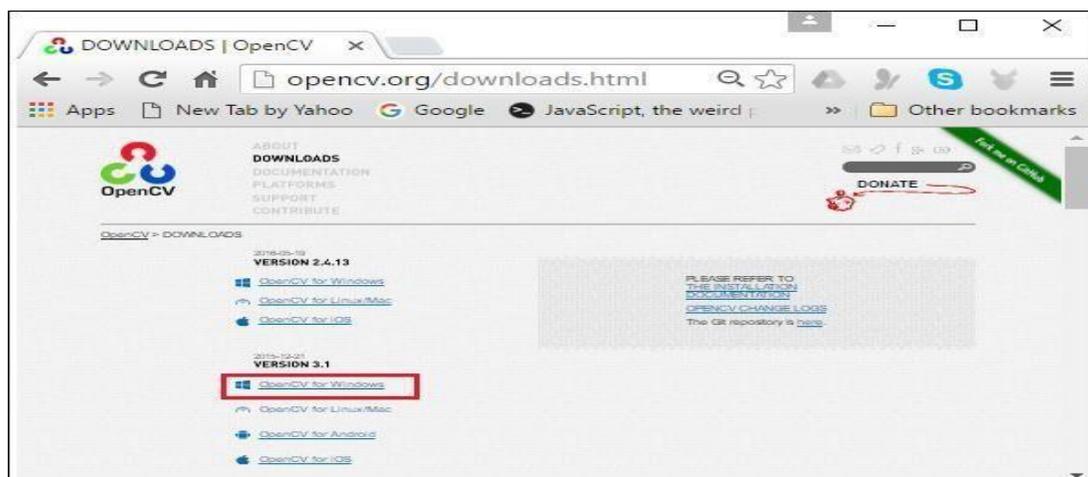


Figure: 4.11 : choosing the version

Step 3 – On clicking the highlighted link in the above screenshot, a file named **opencv- 3.1.0.exe** will be downloaded. Extract this file to generate a folder **OpenCV** in your system, as shown in the following screenshot.

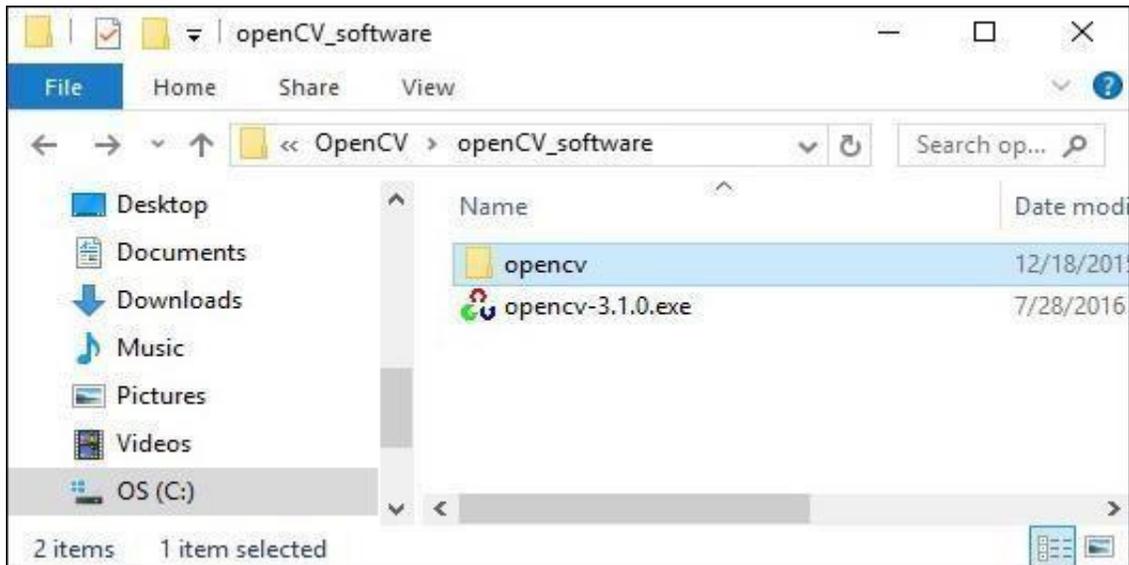


Figure 4.12: Installation step3

Step 4 – Open the folder **OpenCV** → **build** → **java**. Here you will find the jar file of OpenCV named **OpenCV-310.jar**. Save this file in a separate folder for further use.

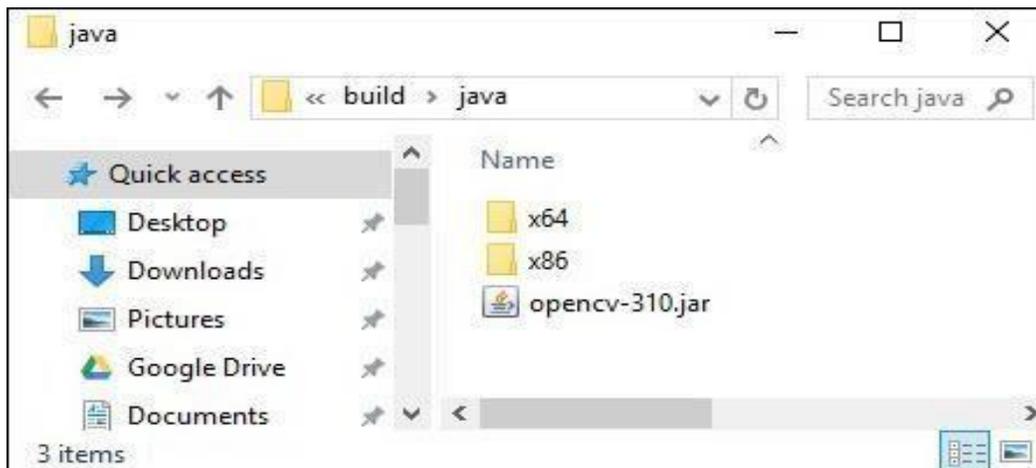


Figure 4.13: installation step4

4.4.2 Applications and Features of OpenCV:

(a) Applications of Computer Vision[14]:

(1) Robotics Application:

- Localization – Determine robot location automatically
- Navigation
- Obstacles avoidance
- Assembly (peg-in-hole, welding, painting)
- Manipulation (e.g. PUMA robot manipulator)
- Human Robot Interaction (HRI) – Intelligent robotics to interact with and serve people.

(2) Medicine Application:

- Classification and detection (e.g. lesion or cells classification and tumor detection)
- 2D/3D segmentation
- 3D human organ reconstruction (MRI or ultrasound)
- Vision-guided robotics surgery

(3) Industrial Automation Application:

- Industrial inspection (defect detection)
- Assembly
- Barcode and package label reading
Object sorting
- Document understanding (e.g. OCR)

(4) Security Application:

- Biometrics (iris, finger print, face recognition)
- Surveillance – Detecting certain suspicious activities or behaviours

(5) Transportation Application:

- Autonomous vehicle
- Safety, e.g., driver vigilance monitoring

(b) Features of OpenCV:

1. Read and write images
2. Capture and save videos
3. Process images (filter, transform)
4. Perform feature detection
5. Detect specific objects such as faces, eyes, cars, in the videos or images.
6. Analyze the video i.e., estimate the motion in it, subtract the background, and track objects in it.

5. IMPLEMENTATION

5.1 Main Activity of Disease Detection:

```
import time

import tkinter

import cv2

import matplotlib.pyplot as plt

import glob

import sys

import numpy as np

import pickle

from tkinter import font

from tkinter import *

#from kFileDialog import askopenfilename

from tkinter import filedialog

import time

from sklearn.neural_network import MLPClassifier

hog = cv2.HOGDescriptor()

# run block of code and catch warnings

import warnings

if not sys.warnoptions:

    warnings.simplefilter("ignore")
```

```
root = Tk()

root.wm_iconbitmap('C:/Users/DELL/Desktop/major_project/Icon.ico')

photo = tkinter.PhotoImage(file="C:/Users/DELL/Desktop/major_project/leaf1.png")

w = tkinter.Label(root, image=photo)

w.pack()

lblInst = tkinter.Label(root,)

lblInst.pack()

appHighlightFont = font.Font(family='Helvetica', size=12, weight='bold')

font.families()

root.geometry('500x300')

root.configure(background='#145A32')

clf = pickle.load(open('C:/Users/DELL/Desktop/major_project/neural.model','rb'))
#Create From TrainingModel.py

def main(img_rec):

    img = img_rec

    img = cv2.resize(img,(150,150))

    h = hog.compute(img)

    fet = np.array(h)

    fet = np.reshape(fet,[1, 124740])
```

```
if (clf.predict(fet)[0] == 0):  
    print('Normal/r/n')  
  
elif (clf.predict(fet)[0] == 1):  
    print('Disease: Brown Spot/r/n')  
    file = open('C:/Users/DELL/Desktop/major_project/BrownSpot-solution.txt', 'r')  
    print('Solution:/r/n')  
    print(file.read())  
  
elif (clf.predict(fet)[0] == 2):  
    print('Disease:Paddy Blast/r/n')  
    file = open('C:/Users/DELL/Desktop/major_project/Rice Blast.txt', 'r')  
    print('Solution:/r/n')  
    print(file.read())  
  
elif (clf.predict(fet)[0] == 3):  
    print('Disease:Bacterial/r/n')  
    file = open('C:/Users/DELL/Desktop/major_project/bacterialleaf.txt', 'r')  
    print('Solution:/r/n')  
    print(file.read())  
  
elif (clf.predict(fet)[0] != 0,1,2,3):  
    print('error/r/n')  
  
elif (clf.predict(fet)[0] != 0 and clf.predict(fet)[0] != 1 and clf.predict(fet)[0] != 2 and  
clf.predict(fet)[0] != 3):  
    print('negative image')
```

```
def image_disk():  
    Tk().withdraw()  
    filename = filedialog.askopenfilename()  
    #img = cv2.imread(filename)  
    img = cv2.imread(filename)  
    main(img)  
  
def image_camera():  
    cam = cv2.VideoCapture(0)  
  
    cv2.namedWindow('test')  
    img_counter = 0  
    while True:  
        ret, frame = cam.read()  
        cv2.imshow('test',frame)  
  
        if not ret:  
            break  
        k = cv2.waitKey(1)  
  
        if k % 256 == 27: # PRESS ESCAPE TO CLOSE THE WEBCAM WINDOW  
            # ESC pressed  
            print("Escape hit, closing...")
```

```

    break

    elif k % 256 == 32: # TAKE IMAGE PY PRESSING SPACE (TAKE ONLY 1 AT
A TIME)

        # SPACE pressed

        img_name = str(img_counter) + ".png"

        cv2.imwrite(img_name, frame)

        print("{} written!".format(img_name))

        img_counter += 1

    cam.release()

    cv2.destroyAllWindows()

    my_img = cv2.imread("C:/Users/DELL/Desktop/major_project/0.png") # CV2 will
only read image named "0.png"

    main(my_img)

    button = Button(root,

        text="Select Image From Disk",

        font="appHighlightFont",

        bg="#000080",

        fg="white",padx=5, pady=15,

        command=image_disk)

    button.place(relx=0.5, rely=0.5, anchor=CENTER)

    #button.grid(row=0, column=0)

    button.pack(side=TOP)

    lblInst = tkinter.Label(root,fg = "green")

    lblInst.pack()

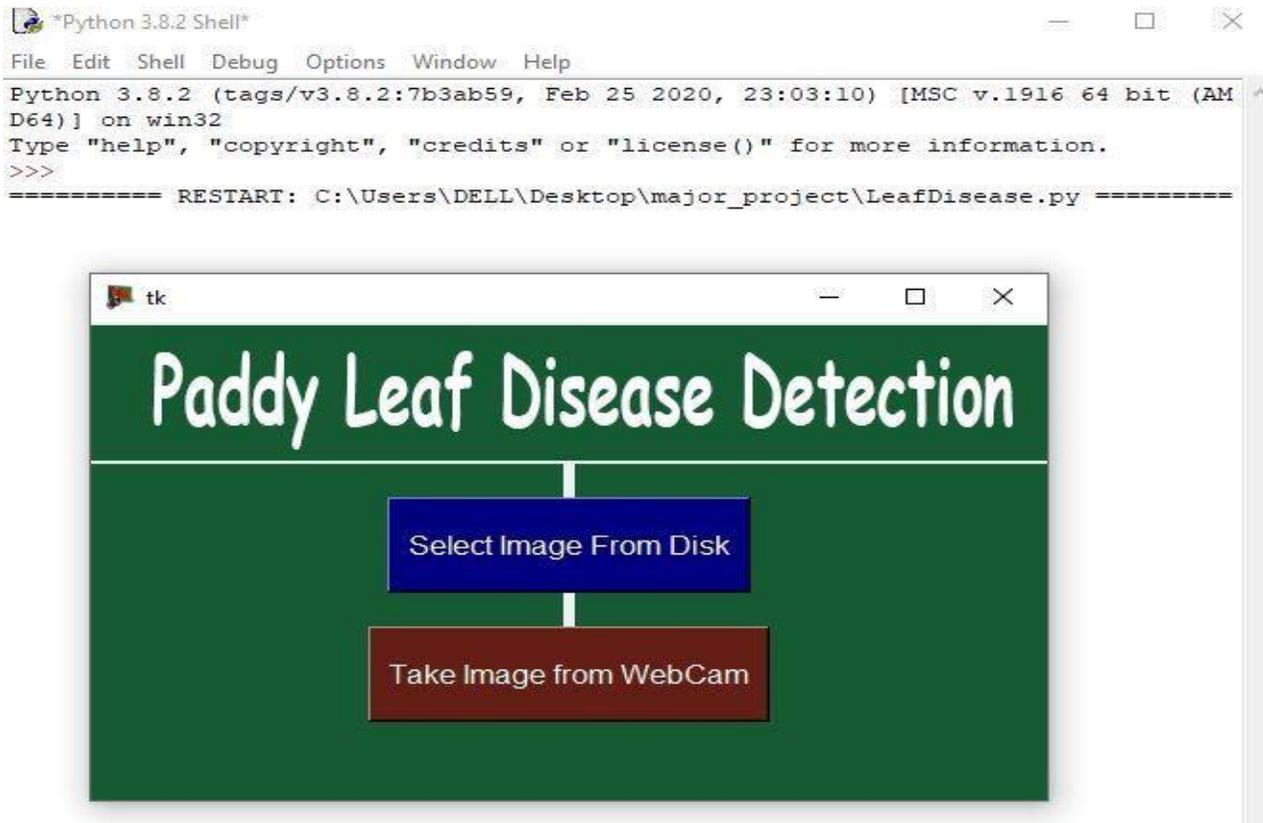
    slogan = Button(root,

        text="Take Image from WebCam",

```

```
font="appHighlightFont", bg="#641E16",  
fg="white", padx=5, pady=15,  
command=image_camera)  
slogan.place(relx=1, rely=1, anchor=CENTER)  
#slogan.place(x=50, y=50)  
slogan.pack(side=TOP)  
root.mainloop()
```

6. RESULT



```
*Python 3.8.2 Shell*
File Edit Shell Debug Options Window Help
Python 3.8.2 (tags/v3.8.2:7b3ab59, Feb 25 2020, 23:03:10) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: C:\Users\DELL\Desktop\major_project\LeafDisease.py =====
Disease: Brown Spot/r/n
Solution:/r/n

*monitor soil nutrients regularly
*apply required fertilizers
*for soils that are low in silicon, apply calcium silicate slag before planting
*To be sure that the seeds are not contaminated, bathe them in hot water (53 - 54°C) for 10 to 12 minutes. To improve water before the hot water treatment.
*Treat seeds with fungicides containing Iprodione, Propiconazole, Azoxystrobin, Trifloxystrobin or Carbendazim.
*Spraying of crop at tillering and late booting stages with Carbendazim 12% + Mancozeb 63% WP @ 1gm/litre or Zineb @ 2
*Growing of resistant/tolerant varieties like Rasi, Jagnanath, IR 36 etc.

Disease:Paddy Blast/r/n
Solution:/r/n
Manipulation of planting time and fertilizer and water management is advised.
*Early sowing of seeds after the onset of the rainy season is more advisable than late-sown crops.
*Excessive use of fertilizer should be avoided.
*Nitrogen should be applied in small increments at any time.
*Spray tricyclazole 75% WP @ 0.6gm/ litre or Propiconazole 25% EC 1ml/ litre or Carbendazim 50% WP @ 1gm/litre of water.

Disease:Bacterial/r/n
Solution:/r/n
Apply judicious level of fertilization (60-80 kg N/ha with required level of potassium) without sacrificing the yield.
*Avoid field to field irrigation.
*Avoid insect damage to the crop.
*Destroy infected stubbles and weeds.
*Avoid shade in the field.
*Grow resistant/tolerant varieties like Ajaya, IR 64, Radha, Pantdhan 6, Pantdhan 10.
```

7. CONCLUSION

This Project is for detecting the crop diseases and providing the solution for particular disease and necessary suggestions and that will be received by the farmer. Thus, our objective of the project was implemented on Rice crops. The diseases are specific to these crops were considered for testing of the algorithm. The experimental results indicate the proposed approach can recognize the diseases with a little computational effort. By this method, the crop diseases will be identified at the initial stage itself and the pest control tools will be applied to solve pest problems while minimizing risks to people and the environment.

8. REFERENCES

- [1] https://www.irjet.net/archives/V6/i5/IRJET_V6I5156.pdf
- [2] <https://github.com/greenJIS/A-Study-on-Paddy-Disease-Detection-using-Color-Co-occurrence-Features/tree/master/Academic%20Files>
- [3] <https://brainly.in/question/4676521>
- [4] <https://www.edrawsoft.com/architecture-diagram.php>
- [5] https://en.wikipedia.org/wiki/Unified_Modeling_Language
- [6] https://www.tutorialspoint.com/uml/uml_use_case_diagram.htm
- [7] https://www.tutorialspoint.com/uml/uml_interaction_diagram.htm
- [8] https://www.tutorialspoint.com/uml/uml_activity_diagram.htm
- [9] <https://www.engineersgarage.com/articles/image-processing-tutorial-applications>
- [10] https://docs.opencv.org/3.0-beta/doc/py_tutorials/py_tutorials.html
- [11] <https://www.python.org/>
- [12] <https://www.invensis.net/blog/it/applications-of-python-in-real-world/>
- [13] <https://www.datasciencecentral.com/profiles/blogs/9-python-libraries-which-can-help-you-in-image-processing>
- [14] <https://en.wikipedia.org/wiki/OpenCV#Applications>

1.INTRODUCTION

What is cloud computing?

Cloud computing is the use of computing resources (hardware and software) that are delivered as a service over a network (typically the Internet). The name comes from the common use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts remote services with a user's data, software and computation. Cloud computing consists of hardware and software resources made available on the Internet as managed third-party services. These services typically provide access to advanced software applications and high-end networks of server computers.

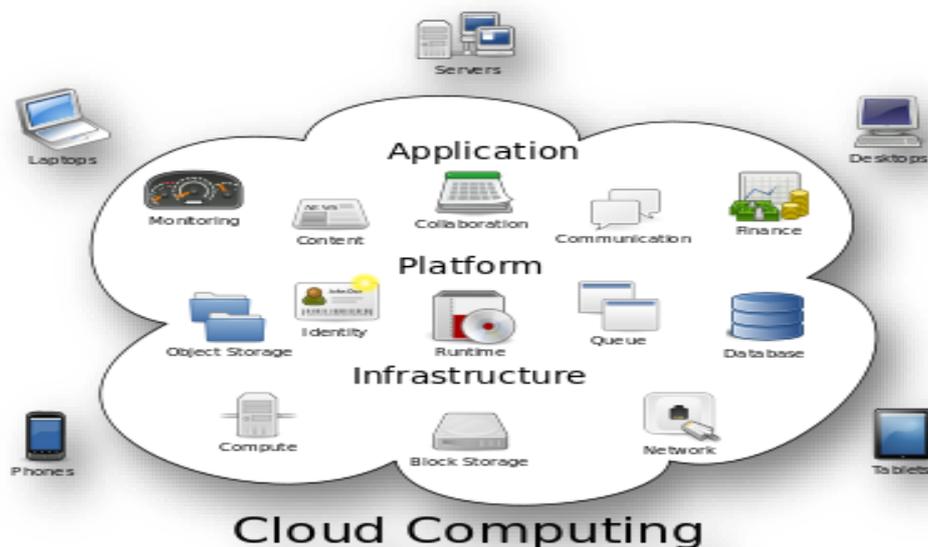


Figure 1.1: Cloud Computing

How Cloud Computing Works?

The goal of cloud computing is to apply traditional supercomputing, or high-performance computing power, normally used by military and research facilities, to perform tens of trillions of computations per second, in consumer-oriented applications such as financial portfolios, to deliver personalized information, to provide data storage or to power large, immersive computer games.

The cloud computing uses networks of large groups of servers typically running low-cost consumer PC technology with specialized connections to spread data-processing

chores across them. This shared IT infrastructure contains large pools of systems that are linked together. Often, virtualization techniques are used to maximize the power of cloud computing.

Characteristics and Services Models:

The salient characteristics of cloud computing based on the definitions provided by the National Institute of Standards and Terminology (NIST) are outlined below:

- **On-demand self-service:** A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider.
- **Broad network access:** Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).
- **Resource pooling:** The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location-independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or data center). Examples of resources include storage, processing, memory, network bandwidth, and virtual machines.
- **Rapid elasticity:** Capabilities can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.
- **Measured service:** Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be managed, controlled, and reported providing transparency for both the provider and consumer of the utilized service.

5 Essential Characteristics of Cloud Computing



Figure 1.2: Characteristics of cloud computing

Services Models:

Cloud Computing comprises three different service models, namely Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS), and Software-as-a-Service (SaaS). The three service models or layer are completed by an end user layer that encapsulates the end user perspective on cloud services. The model is shown in Figure below. If a cloud user accesses services on the infrastructure layer, for instance, she can run her own applications on the resources of a cloud infrastructure and remain responsible for the support, maintenance, and security of these applications herself. If she accesses a service on the application layer, these tasks are normally taken care of by the cloud service provider.

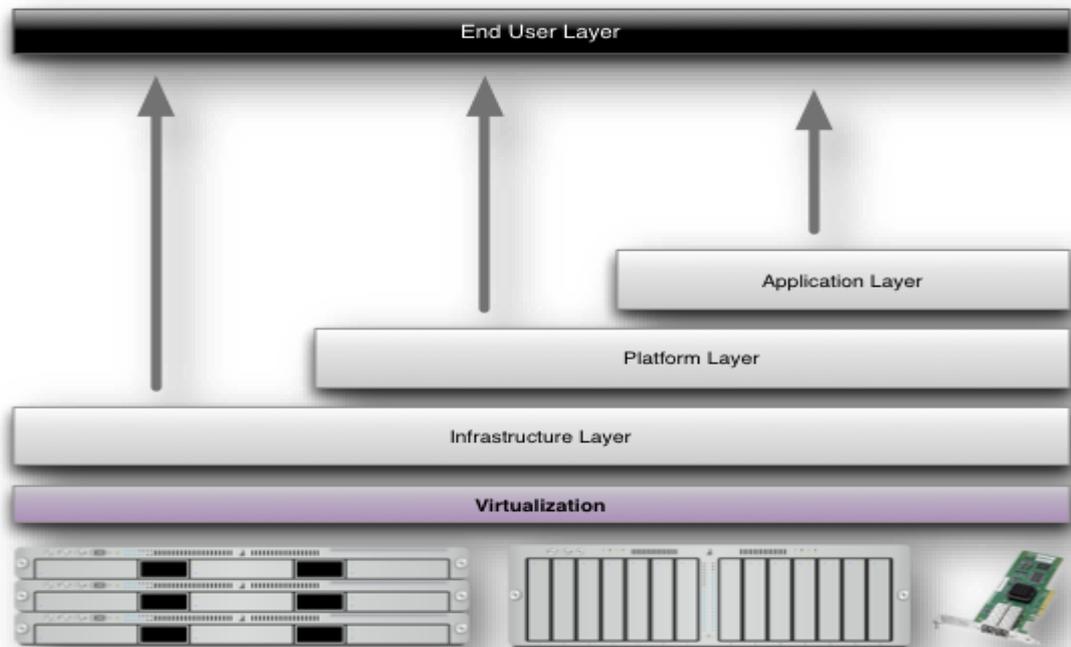


Figure 1.3: Structure of service models

Benefits of cloud computing:

1. **Achieve economies of scale** – increase volume output or productivity with fewer people. Your cost per unit, project or product plummets.
2. **Reduce spending on technology infrastructure.** Maintain easy access to your information with minimal upfront spending. Pay as you go (weekly, quarterly or yearly), based on demand.
3. **Globalize your workforce on the cheap.** People worldwide can access the cloud, provided they have an Internet connection.
4. **Streamline processes.** Get more work done in less time with less people.
5. **Reduce capital costs.** There's no need to spend big money on hardware, software or licensing fees.
6. **Improve accessibility.** You have access anytime, anywhere, making your life so much easier!
7. **Monitor projects more effectively.** Stay within budget and ahead of completion cycle times.
8. **Less personnel training is needed.** It takes fewer people to do more work on a cloud, with a minimal learning curve on hardware and software issues.

9. **Minimize licensing new software.** Stretch and grow without the need to buy expensive software licenses or programs.

10. **Improve flexibility.** You can change direction without serious “people” or “financial” issues at stake.

Advantages:

1. **Price:** Pay for only the resources used.
2. **Security:** Cloud instances are isolated in the network from other instances for improved security.
3. **Performance:** Instances can be added instantly for improved performance. Clients have access to the total resources of the Cloud’s core hardware.
4. **Scalability:** Auto-deploy cloud instances when needed.
5. **Uptime:** Uses multiple servers for maximum redundancies. In case of server failure, instances can be automatically created on another server.
6. **Control:** Able to login from any location. Server snapshot and a software library lets you deploy custom instances.
7. **Traffic:** Deals with spike in traffic with quick deployment of additional instances to handle the load.

2. SYSTEM ANALYSIS

2.1 EXISTING SYSTEM:

- In a PEKS system, using the receiver's public key, the sender attaches some encrypted keywords (referred to as PEKS ciphertexts) with the encrypted data. The receiver then sends the trapdoor of a to-be-searched keyword to the server for data searching. Given the trapdoor and the PEKS ciphertext, the server can test whether the keyword underlying the PEKS ciphertext is equal to the one selected by the receiver. If so, the server sends the matching encrypted data to the receiver.
- Baek et al. proposed a new PEKS scheme without requiring a secure channel, which is referred to as a secure channel-free PEKS (SCF-PEKS).
- Rhee et al. later enhanced Baek et al.'s security model for SCF-PEKS where the attacker is allowed to obtain the relationship between the non-challenge ciphertexts and the trapdoor.
- Byun et al. introduced the off-line keyword guessing attack against PEKS as keywords are chosen from a much smaller space than passwords and users usually use well-known keywords for searching documents.

2.1.1 DISADVANTAGES OF EXISTING SYSTEM:

- Despite of being free from secret key distribution, PEKS schemes suffer from an inherent insecurity regarding the trapdoor keyword privacy, namely inside Keyword Guessing Attack (KGA). The reason leading to such security vulnerability is that anyone who knows receiver's public key can generate the PEKS ciphertext of arbitrary keyword himself.
- Specifically, given a trapdoor, the adversarial server can choose a guessing keyword from the keyword space and then use the keyword to generate a PEKS ciphertext. The server then can test whether the guessing keyword is the one underlying the trapdoor. This guessing-then-testing procedure can be repeated until the correct keyword is found. On one hand, although the server cannot exactly guess the keyword, it is still able to know which small set the underlying keyword belongs to and thus the keyword privacy is not well preserved from the server. On the other hand, their scheme is impractical as the receiver has to locally find the matching ciphertext by using the exact trapdoor to filter out the non-matching ones from the set returned from the server.

2.2 PROPOSED SYSTEM:

- The contributions of this paper are four-fold.
- We formalize a new PEKS framework named Dual-Server Public Key Encryption with Keyword Search (DS-PEKS) to address the security vulnerability of PEKS.
- A new variant of Smooth Projective Hash Function (SPHF), referred to as linear and homomorphic SPHF, is introduced for a generic construction of DS-PEKS.
- We show a generic construction of DS-PEKS using the proposed Lin-Hom SPHF.
- To illustrate the feasibility of our new framework, an efficient instantiation of our SPHF based on the Diffie-Hellman language is presented in this paper.

2.2.1 ADVANTAGES OF PROPOSED SYSTEM:

- All the existing schemes require the pairing computation during the generation of PEKS cipher text and testing and hence are less efficient than our scheme, which does not need any pairing computation.
- Our scheme is the most efficient in terms of PEKS computation. It is because that our scheme does not include pairing computation. Particularly, the existing scheme requires the most computation cost due to 2 pairing computation per PEKS generation.
- In our scheme, although we also require another stage for the testing, our computation cost is actually lower than that of any existing scheme as we do not require any pairing computation and all the searching work is handled by the server.

2.3 HARDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 120 GB.
- Floppy Drive : 1.44 Mb.
- Monitor : 15 VGA Colour.
- Mouse : Logitech.
- Ram : 512 Mb.

2.4 SOFTWARE REQUIREMENTS:

- Operating system : Windows XP/7/8/10
- Coding Language : JAVA/J2EE
- Data Base : MYSQL
- Web Server : Apache TOMCAT 7.0.61
- Tool (IDE) : Net Beans 8.1
- Web Technologies : HTML, CSS, JavaScript, Servlets, JSPs

2.5 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- **ECONOMICAL FEASIBILITY**
- **TECHNICAL FEASIBILITY**
- **SOCIAL FEASIBILITY**

2.5.1 ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

2.5.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical

resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

2.5.3 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

2.6 MODULES DESCRIPTION:

2.6.1 System Construction Module

In the first module, we develop the system with the entities required to provide our system. 1) Cloud User: the user, who can be an individual or an organization originally storing their data in cloud and accessing the data. 2) Cloud Service Provider (CSP): the CSP, who manages cloud servers (CSs) and provides a paid storage space on its infrastructure to users as a service. We propose a new framework, namely DS-PEKS, and present its formal definition and security models. We then define a new variant of smooth projective hash function (SPHF). A generic construction of DS-PEKS from LH-SPHF is shown with formal correctness analysis and security proofs. Finally, we present an efficient instantiation of DS-PEKS from SPHF.

2.6.2 Semantic-Security against Chosen Keyword Attack

In the module, we develop the semantic-security against chosen keyword attack which guarantees that no adversary is able to distinguish a keyword from another one given the corresponding PEKS ciphertext. That is, the PEKS ciphertext does not reveal any information about the underlying keyword to any adversary.

2.6.3 Front Server:

After receiving the query from the receiver, the front server pre-processes the trapdoor and all the PEKS ciphertexts using its private key, and then sends some internal testing-states to the back server with the corresponding trapdoor and PEKS ciphertexts hidden.

2.6.4 Back Server:

In this module, the back server can then decide which documents are queried by the receiver using its private key and the received internal testing-states from the front server.

3. SYSTEM DESIGN

3.1 SYSTEM ARCHITECTURE:

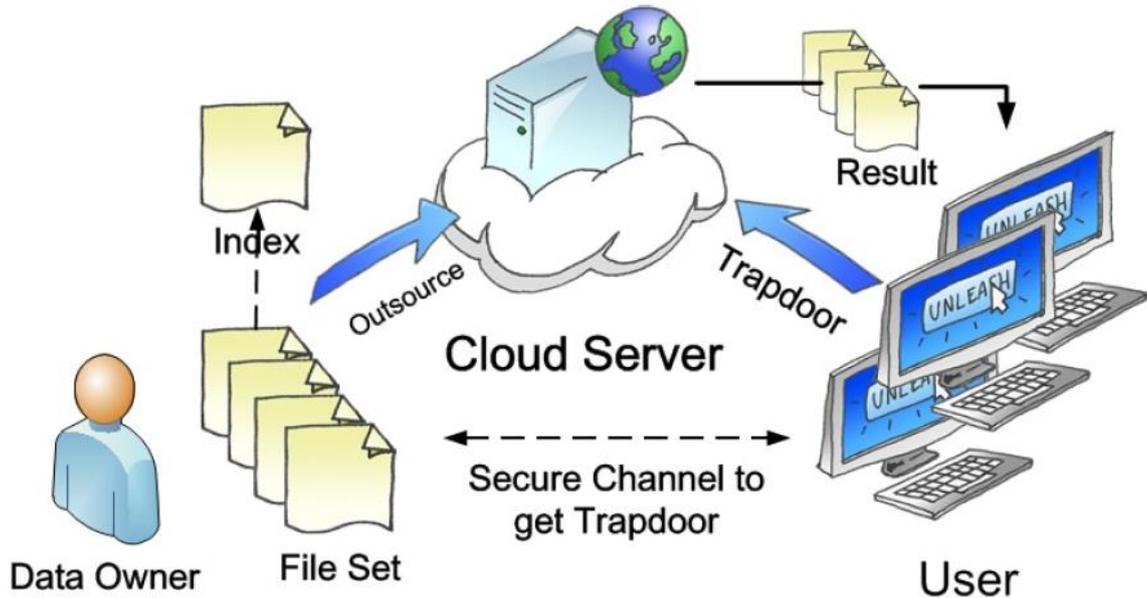


Figure 3.1: System Architecture

3.2 INPUT DESIGN AND OUTPUT DESIGN

3.2.1 INPUT DESIGN

The input design is the link between the information system and the user. It comprises the developing specification and procedures for data preparation and those steps are necessary to put transaction data in to a usable form for processing can be achieved by inspecting the computer to read data from a written or printed document or it can occur by having people keying the data directly into the system. The design of input focuses on controlling the amount of input required, controlling the errors, avoiding delay, avoiding extra steps and keeping the process simple. The input is designed in such a way so that it provides security and ease of use with retaining the privacy. Input Design considered the following things:

- What data should be given as input?
- How the data should be arranged or coded?
- The dialog to guide the operating personnel in providing input.

- Methods for preparing input validations and steps to follow when error occur.

OBJECTIVES

1. Input Design is the process of converting a user-oriented description of the input into a computer-based system. This design is important to avoid errors in the data input process and show the correct direction to the management for getting correct information from the computerized system.

2. It is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing input is to make data entry easier and to be free from errors. The data entry screen is designed in such a way that all the data manipulates can be performed. It also provides record viewing facilities.

3. When the data is entered it will check for its validity. Data can be entered with the help of screens. Appropriate messages are provided as when needed so that the user will not be in maize of instant. Thus the objective of input design is to create an input layout that is easy to follow

3.2.2 OUTPUT DESIGN

A quality output is one, which meets the requirements of the end user and presents the information clearly. In any system results of processing are communicated to the users and to other system through outputs. In output design it is determined how the information is to be displaced for immediate need and also the hard copy output. It is the most important and direct source information to the user. Efficient and intelligent output design improves the system's relationship to help user decision-making.

1. Designing computer output should proceed in an organized, well thought out manner; the right output must be developed while ensuring that each output element is designed so that people will find the system can use easily and effectively. When analysis design computer output, they should Identify the specific output that is needed to meet the requirements.

2. Select methods for presenting information.

3. Create document, report, or other formats that contain information produced by the system.

The output form of an information system should accomplish one or more of the following objectives.

- Convey information about past activities, current status or projections of the
- Future.
- Signal important events, opportunities, problems, or warnings.
- Trigger an action.
- Confirm an action.

3.3 DATA FLOW DIAGRAM:

1. The DFD is also called as bubble chart. It is a simple graphical formalism that can be used to represent a system in terms of input data to the system, various processing carried out on this data, and the output data is generated by this system.

2. The data flow diagram (DFD) is one of the most important modeling tools. It is used to model the system components. These components are the system process, the data used by the process, an external entity that interacts with the system and the information flows in the system.

3. DFD shows how the information moves through the system and how it is modified by a series of transformations. It is a graphical technique that depicts information flow and the transformations that are applied as data moves from input to output.

4. DFD is also known as bubble chart. A DFD may be used to represent a system at any level of abstraction. DFD may be partitioned into levels that represent increasing information flow and functional detail

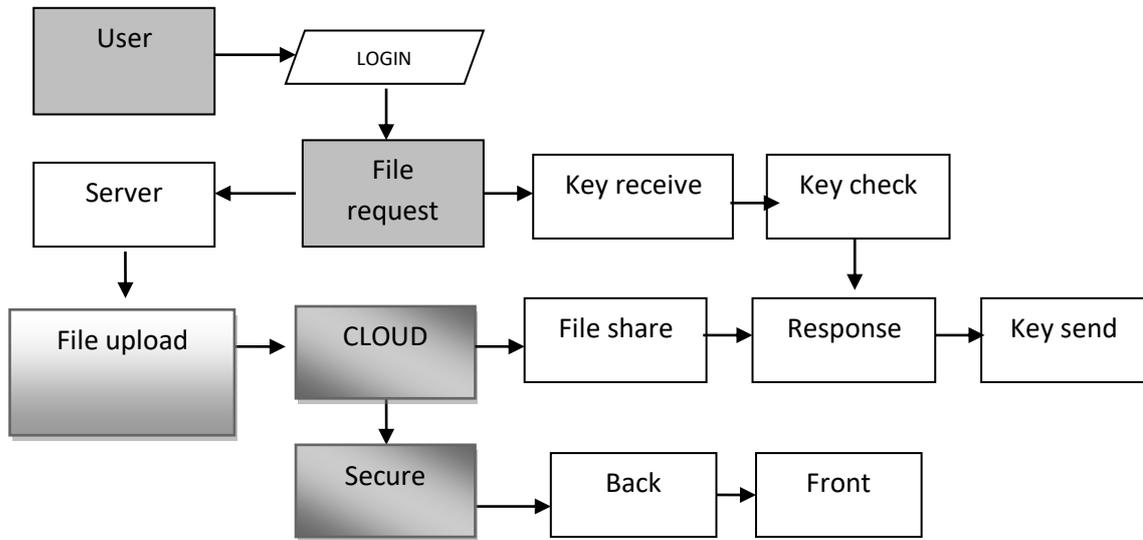


Figure 3.2: Data Flow Diagram

3.4 UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

GOALS:

The Primary goals in the design of the UML are as follows:

1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Encourage the growth of OO tools market.
6. Support higher level development concepts such as collaborations, frameworks, patterns and components.
7. Integrate best practices.

3.4.1 USE CASE DIAGRAM:

A use case diagram in the Unified Modeling Language (UML) is a type of behavioral diagram defined by and created from a Use-case analysis. Its purpose is to present a graphical overview of the functionality provided by a system in terms of actors, their goals (represented as use cases), and any dependencies between those use cases. The main purpose of a use case diagram is to show what system functions are performed for which actor. Roles of the actors in the system can be depicted.

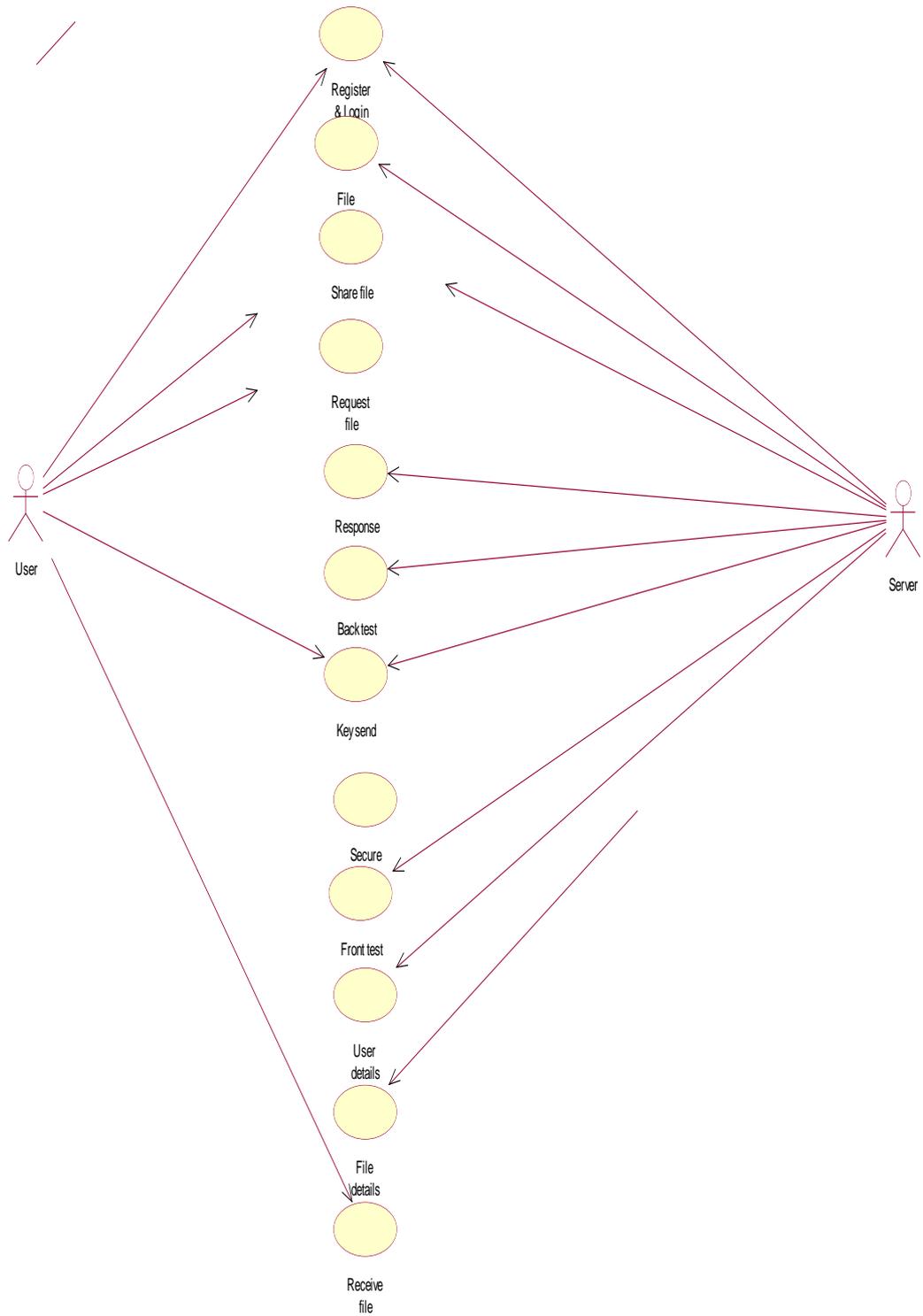


Figure 3.2: Use Case Diagram

3.4.2 CLASS DIAGRAM:

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information.

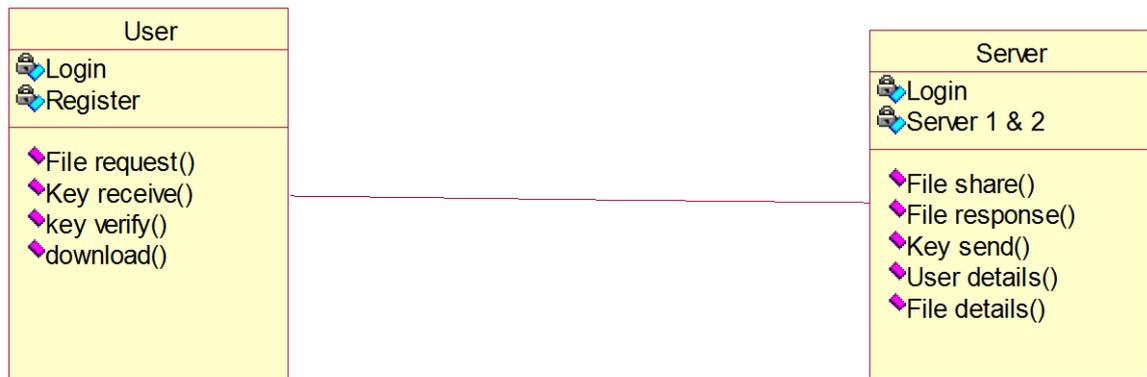


Figure 3.3: Class Diagram

3.4.3 SEQUENCE DIAGRAM:

A sequence diagram in Unified Modeling Language (UML) is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. Sequence diagrams are sometimes called event diagrams, event scenarios, and timing diagrams.

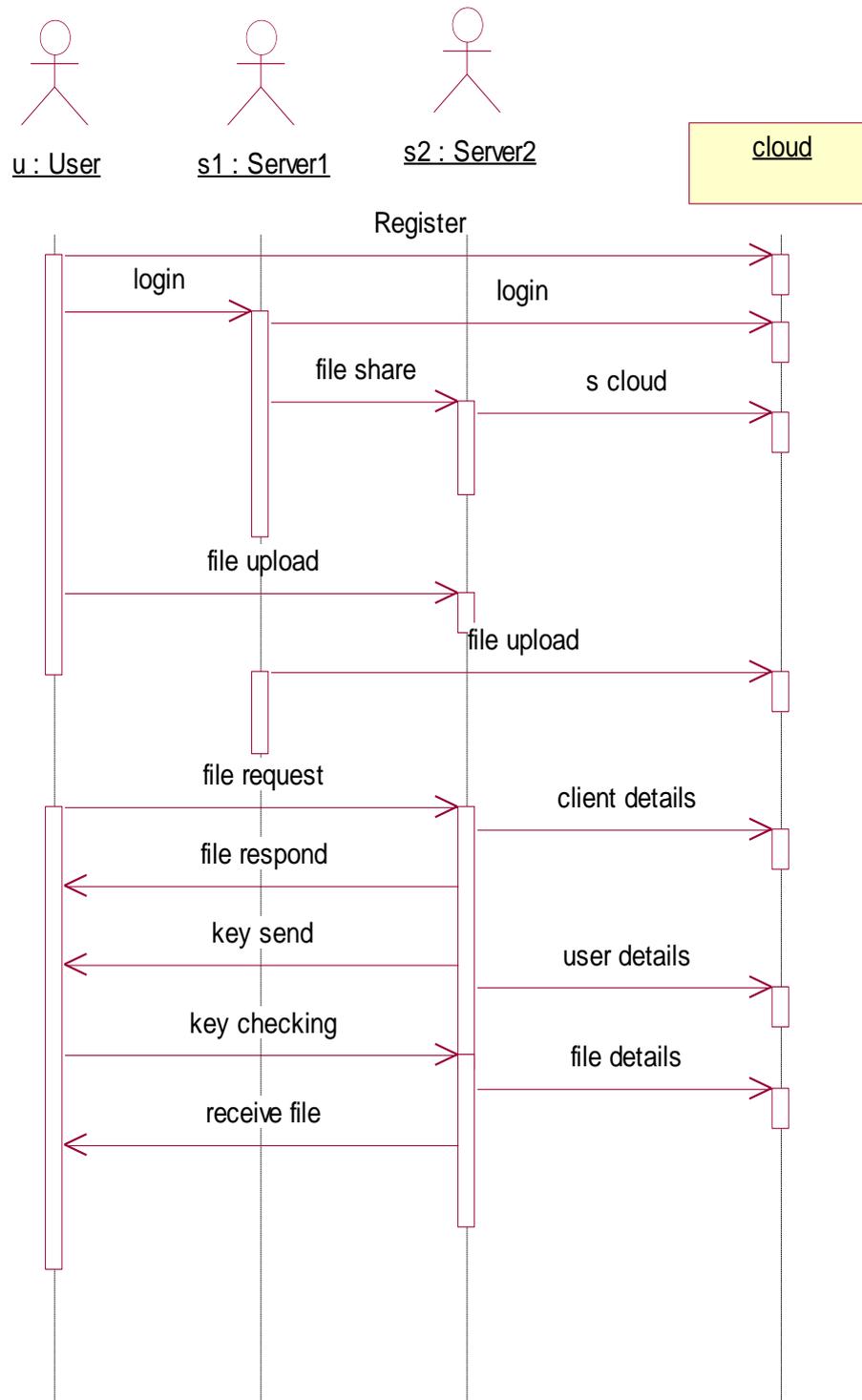


Figure 3.4: Sequence Diagram

3.4.4 ACTIVITY DIAGRAM:

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control

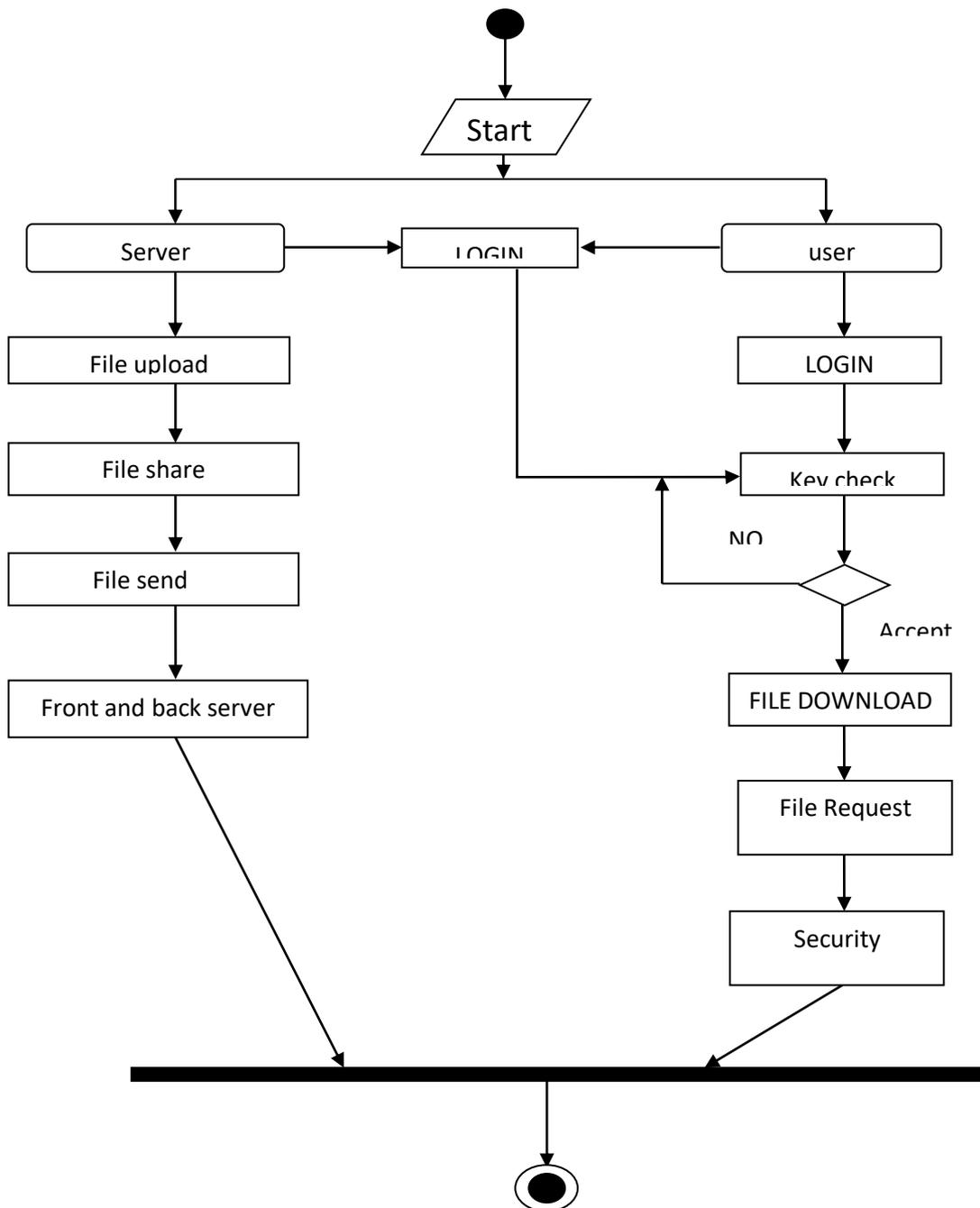


Figure 3.5: Activity Diagram

4. TECHNOLOGY

4.1 Java Technology

Java technology is both a programming language and a platform.

The Java Programming Language

The Java programming language is a high-level language that can be characterized by all of the following buzzwords:

- Simple
- Architecture neutral
- Object oriented
- Portable
- Distributed
- High performance
- Interpreted
- Multithreaded
- Robust
- Dynamic
- Secure

With most programming languages, you either compile or interpret a program so that you can run it on your computer. The Java programming language is unusual in that a program is both compiled and interpreted. With the compiler, first you translate a program into an intermediate language called Java byte codes —the platform-independent codes interpreted by the interpreter on the Java platform. The interpreter parses and runs each Java byte code instruction on the computer. Compilation happens just once; interpretation occurs each time the program is executed. The following Figure illustrates how this works.

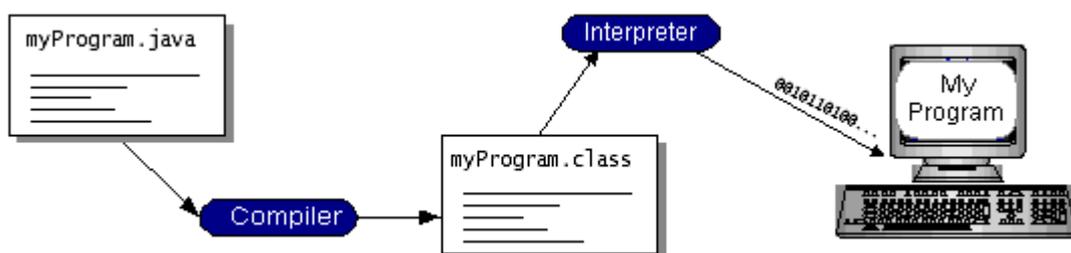


Figure 4.1: Working of JPL

You can think of Java byte codes as the machine code instructions for the Java Virtual Machine (Java VM). Every Java interpreter, whether it's a development tool or a Web browser that can run applets, is an implementation of the Java VM. Java byte codes help make "write once, run anywhere" possible. You can compile your program into byte codes on any platform that has a Java compiler. The byte codes can then be run on any implementation of the Java VM. That means that as long as a computer has a Java VM, the same program written in the Java programming language can run on Windows 2000, a Solaris workstation, or on an iMac.

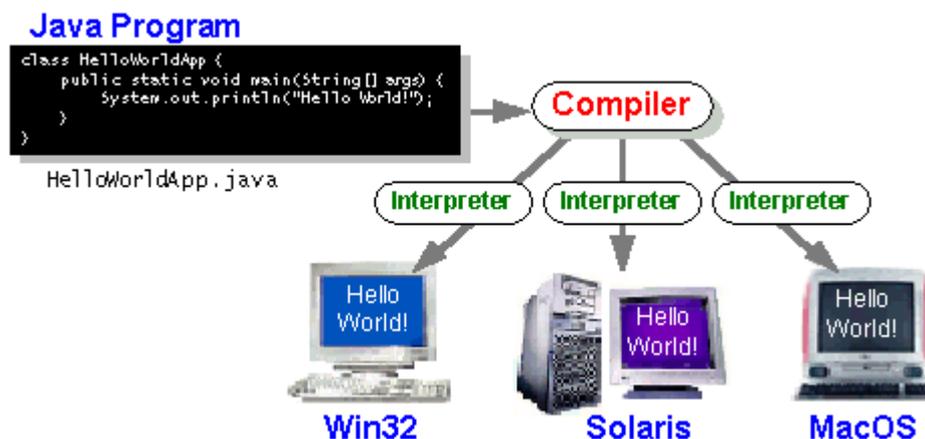


Figure 4.2: JVM

The Java Platform

A platform is the hardware or software environment in which a program runs. We've already mentioned some of the most popular platforms like Windows 2000, Linux, Solaris, and MacOS. Most platforms can be described as a combination of the operating system and hardware. The Java platform differs from most other platforms in that it's a software-only platform that runs on top of other hardware-based platforms.

The Java platform has two components:

- The Java Virtual Machine (Java VM)
- The Java Application Programming Interface (Java API)

You've already been introduced to the Java VM. It's the base for the Java platform and is ported onto various hardware-based platforms.

The Java API is a large collection of ready-made software components that provide many useful capabilities, such as graphical user interface (GUI) widgets. The Java API is grouped into libraries of related classes and interfaces; these libraries are known as

packages. What Can Java Technology Do? Highlights what functionality some of the packages in the Java API provide.

The following Figure depicts a program that's running on the Java platform. As the Figure shows, the Java API and the virtual machine insulate the program from the hardware.

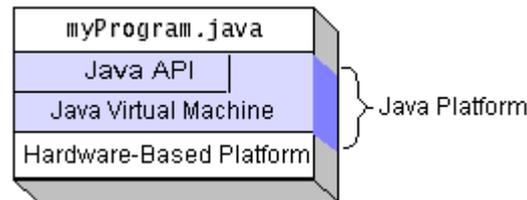


Figure 4.3: Running of Java Program

Native code is code that after you compile it, the compiled code runs on a specific hardware platform. As a platform-independent environment, the Java platform can be a bit slower than native code. However, smart compilers, well-tuned interpreters, and just-in-time byte code compilers can bring performance close to that of native code without threatening portability.

What Can Java Technology Do?

The most common types of programs written in the Java programming language are applets and applications. If you've surfed the Web, you're probably already familiar with applets. An applet is a program that adheres to certain conventions that allow it to run within a Java-enabled browser. However, the Java programming language is not just for writing cute, entertaining applets for the Web. The general-purpose, high-level Java programming language is also a powerful software platform. Using the generous API, you can write many types of programs.

An application is a standalone program that runs directly on the Java platform. A special kind of application known as a *server* serves and supports clients on a network. Examples of servers are Web servers, proxy servers, mail servers, and print servers. Another specialized program is a *servlet*. A servlet can almost be thought of as an applet that runs on the server side. Java Servlets are a popular choice for building interactive web applications, replacing the use of CGI scripts. Servlets are similar to applets in that they are runtime extensions of applications. Instead of working in browsers, though, servlets run within Java Web servers, configuring or tailoring the server.

How does the API support all these kinds of programs? It does so with packages of software components that provides a wide range of functionality. Every full implementation of the Java platform gives you the following features:

- **The essentials:** Objects, strings, threads, numbers, input and output, data structures, system properties, date and time, and so on.
- **Applets:** The set of conventions used by applets.
- **Networking:** URLs, TCP (Transmission Control Protocol), UDP (User Datagram Protocol) sockets, and IP (Internet Protocol) addresses.
- **Internationalization:** Help for writing programs that can be localized for users worldwide. Programs can automatically adapt to specific locales and be displayed in the appropriate language.
- **Security:** Both low level and high level, including electronic signatures, public and private key management, access control, and certificates.
- **Software components:** Known as JavaBeans™, can plug into existing component architectures.
- **Object serialization:** Allows lightweight persistence and communication via Remote Method Invocation (RMI).
- **Java Database Connectivity (JDBC™):** Provides uniform access to a wide range of relational databases.

The Java platform also has APIs for 2D and 3D graphics, accessibility, servers, collaboration, telephony, speech, animation, and more. The following Figure depicts what is included in the Java 2 SDK.

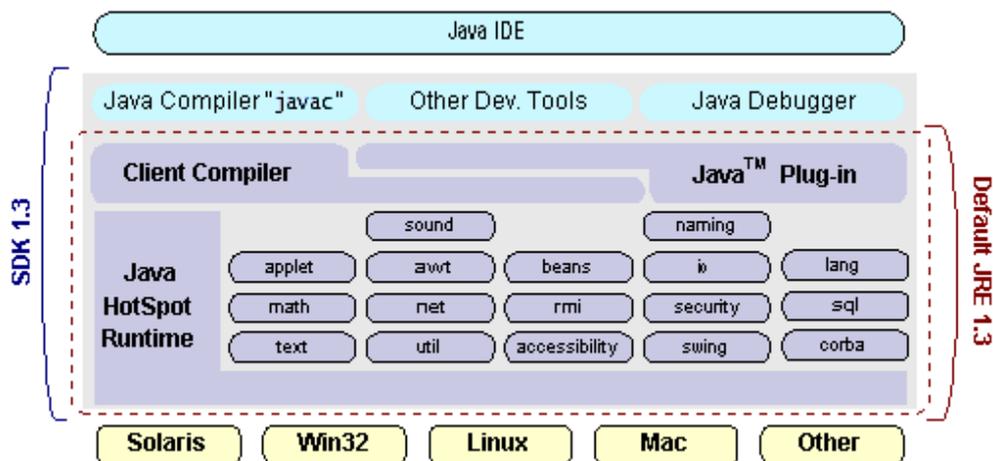


Figure 4.4: Java 2 SDK

How Will Java Technology Change My Life?

We can't promise you fame, fortune, or even a job if you learn the Java programming language. Still, it is likely to make your programs better and requires less effort than other languages. We believe that Java technology will help you do the following:

- **Get started quickly:** Although the Java programming language is a powerful object-oriented language, it's easy to learn, especially for programmers already familiar with C or C++.
- **Write less code:** Comparisons of program metrics (class counts, method counts, and so on) suggest that a program written in the Java programming language can be four times smaller than the same program in C++.
- **Write better code:** The Java programming language encourages good coding practices, and its garbage collection helps you avoid memory leaks. Its object orientation, its JavaBeans component architecture, and its wide-ranging, easily extendible API let you reuse other people's tested code and introduce fewer bugs.
- **Develop programs more quickly:** Your development time may be as much as twice as fast versus writing the same program in C++. Why? You write fewer lines of code and it is a simpler programming language than C++.
- **Avoid platform dependencies with 100% Pure Java:** You can keep your program portable by avoiding the use of libraries written in other languages. The 100% Pure Java™ Product Certification Program has a repository of historical process manuals, white papers, brochures, and similar materials online.
- **Write once, run anywhere:** Because 100% Pure Java programs are compiled into machine-independent byte codes, they run consistently on any Java platform.
- **Distribute software more easily:** You can upgrade applets easily from a central server. Applets take advantage of the feature of allowing new classes to be loaded "on the fly," without recompiling the entire program.

ODBC

Microsoft Open Database Connectivity (ODBC) is a standard programming interface for application developers and database systems providers. Before ODBC became a de facto standard for Windows programs to interface with database systems, programmers had to use proprietary languages for each database they wanted to connect to. Now, ODBC has made the choice of the database system almost irrelevant from a

coding perspective, which is as it should be. Application developers have much more important things to worry about than the syntax that is needed to port their program from one database to another when business needs suddenly change.

Through the ODBC Administrator in Control Panel, you can specify the particular database that is associated with a data source that an ODBC application program is written to use. Think of an ODBC data source as a door with a name on it. Each door will lead you to a particular database. For example, the data source named Sales Figureures might be a SQL Server database, whereas the Accounts Payable data source could refer to an Access database. The physical database referred to by a data source can reside anywhere on the LAN.

The ODBC system files are not installed on your system by Windows 95. Rather, they are installed when you setup a separate database application, such as SQL Server Client or Visual Basic 4.0. When the ODBC icon is installed in Control Panel, it uses a file called ODBCINST.DLL. It is also possible to administer your ODBC data sources through a stand-alone program called ODBCADM.EXE. There is a 16-bit and a 32-bit version of this program and each maintains a separate list of ODBC data sources.

From a programming perspective, the beauty of ODBC is that the application can be written to use the same set of function calls to interface with any data source, regardless of the database vendor. The source code of the application doesn't change whether it talks to Oracle or SQL Server. We only mention these two as an example. There are ODBC drivers available for several dozen popular database systems. Even Excel spreadsheets and plain text files can be turned into data sources. The operating system uses the Registry information written by ODBC Administrator to determine which low-level ODBC drivers are needed to talk to the data source (such as the interface to Oracle or SQL Server). The loading of the ODBC drivers is transparent to the ODBC application program. In a client/server environment, the ODBC API even handles many of the network issues for the application programmer.

The advantages of this scheme are so numerous that you are probably thinking there must be some catch. The only disadvantage of ODBC is that it isn't as efficient as talking directly to the native database interface. ODBC has had many detractors make the charge that it is too slow. Microsoft has always claimed that the critical factor in performance is the quality of the driver software that is used. In our humble opinion, this is true. The availability of good ODBC drivers has improved a great deal recently.

And anyway, the criticism about performance is somewhat analogous to those who said that compilers would never match the speed of pure assembly language. Maybe not, but the compiler (or ODBC) gives you the opportunity to write cleaner programs, which means you finish sooner. Meanwhile, computers get faster every year.

4.2 JDBC

In an effort to set an independent database standard API for Java; Sun Microsystems developed Java Database Connectivity, or JDBC. JDBC offers a generic SQL database access mechanism that provides a consistent interface to a variety of RDBMSs. This consistent interface is achieved through the use of “plug-in” database connectivity modules, or drivers. If a database vendor wishes to have JDBC support, he or she must provide the driver for each platform that the database and Java run on.

To gain a wider acceptance of JDBC, Sun based JDBC’s framework on ODBC. As you discovered earlier in this chapter, ODBC has widespread support on a variety of platforms. Basing JDBC on ODBC will allow vendors to bring JDBC drivers to market much faster than developing a completely new connectivity solution.

JDBC was announced in March of 1996. It was released for a 90 day public review that ended June 8, 1996. Because of user input, the final JDBC v1.0 specification was released soon after.

The remainder of this section will cover enough information about JDBC for you to know what it is about and how to use it effectively. This is by no means a complete overview of JDBC. That would fill an entire book.

JDBC Goals

Few software packages are designed without goals in mind. JDBC is one that, because of its many goals, drove the development of the API. These goals, in conjunction with early reviewer feedback, have finalized the JDBC class library into a solid framework for building database applications in Java.

The goals that were set for JDBC are important. They will give you some insight as to why certain classes and functionalities behave the way they do. The eight design goals for JDBC are as follows:

1. SQL Level API

The designers felt that their main goal was to define a SQL interface for Java. Although not the lowest database interface level possible, it is at a low enough level for higher-level tools and APIs to be created. Conversely, it is at a high enough level for application programmers to use it confidently. Attaining this goal allows for future tool vendors to “generate” JDBC code and to hide many of JDBC’s complexities from the end user.

2. SQL Conformance

SQL syntax varies as you move from database vendor to database vendor. In an effort to support a wide variety of vendors, JDBC will allow any query statement to be passed through it to the underlying database driver. This allows the connectivity module to handle non-standard functionality in a manner that is suitable for its users.

3. JDBC must be implemental on top of common database interfaces

The JDBC SQL API must “sit” on top of other common SQL level APIs. This goal allows JDBC to use existing ODBC level drivers by the use of a software interface. This interface would translate JDBC calls to ODBC and vice versa.

4. Provide a Java interface that is consistent with the rest of the Java system

Because of Java’s acceptance in the user community thus far, the designers feel that they should not stray from the current design of the core Java system.

5. Keep it simple

This goal probably appears in all software design goal listings. JDBC is no exception. Sun felt that the design of JDBC should be very simple, allowing for only one method of completing a task per mechanism. Allowing duplicate functionality only serves to confuse the users of the API.

6. Use strong, static typing wherever possible

Strong typing allows for more error checking to be done at compile time; also, less error appear at runtime.

7. Keep the common cases simple

Because more often than not, the usual SQL calls used by the programmer are simple SELECT's, INSERT's, DELETE's and UPDATE's, these queries should be simple to perform with JDBC. However, more complex SQL statements should also be possible.

Finally we decided to proceed the implementation using JavaNetworking.

And for dynamically updating the cache table we go for MSAccess database.

Java ha two things: a programming language and a platform.

Java is a high-level programming language that is all of the following

- Simple
- Architecture-neutral
- Object-oriented
- Portable
- Distributed
- High-performance
- Interpreted
- multithreaded
- Robust
- Dynamic
- Secure

Java is also unusual in that each Java program is both compiled and interpreted. With a compile you translate a Java program into an intermediate language called Java byte codes the platform-independent code instruction is passed and run on the computer.

Compilation happens just once; interpretation occurs each time the program is executed. The Figure illustrates how this works.

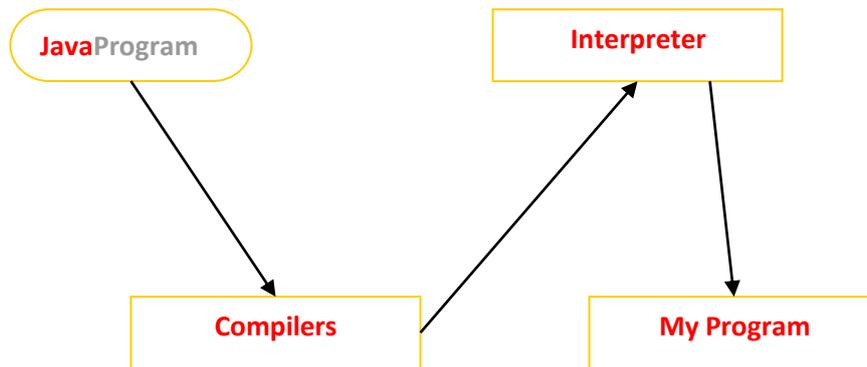


Figure 4.5: Compiling

You can think of Java byte codes as the machine code instructions for the Java Virtual Machine (Java VM). Every Java interpreter, whether it’s a Java development tool or a Web browser that can run Java applets, is an implementation of the Java VM. The Java VM can also be implemented in hardware

Java byte codes help make “write once, run anywhere” possible. You can compile your Java program into byte codes on my platform that has a Java compiler. The byte codes can then be run any implementation of the Java VM. For example, the same Java program can run Windows NT, Solaris, and Macintosh.

Networking

TCP/IP stack

The TCP/IP stack is shorter than the OSI one:

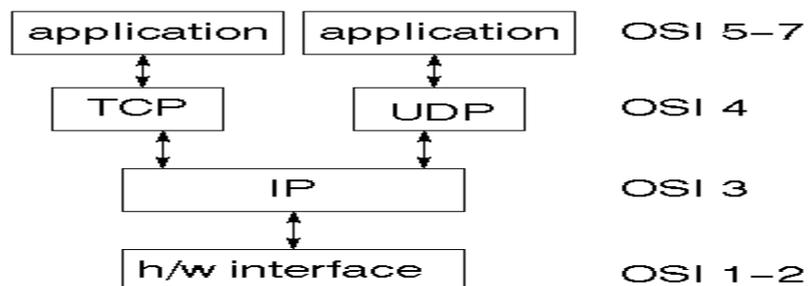


Figure 4.6: TCP/IP

TCP is a connection-oriented protocol; UDP (User Datagram Protocol) is a connectionless protocol.

IP datagram's

The IP layer provides a connectionless and unreliable delivery system. It considers each datagram independently of the others. Any association between datagram must be supplied by the higher layers. The IP layer supplies a checksum that includes its own header. The header includes the source and destination addresses. The IP layer handles routing through an Internet. It is also responsible for breaking up large datagram into smaller ones for transmission and reassembling them at the other end.

UDP

UDP is also connectionless and unreliable. What it adds to IP is a checksum for the contents of the datagram and port numbers. These are used to give a client/server model - see later.

TCP

TCP supplies logic to give a reliable connection-oriented protocol above IP. It provides a virtual circuit that two processes can use to communicate.

Internet addresses

In order to use a service, you must be able to find it. The Internet uses an address scheme for machines so that they can be located. The address is a 32 bit integer which gives the IP address. This encodes a network ID and more addressing. The network ID falls into various classes according to the size of the network address.

Network address

Class A uses 8 bits for the network address with 24 bits left over for other addressing. Class B uses 16 bit network addressing. Class C uses 24 bit network addressing and class D uses all 32.

Subnet address

Internally, the UNIX network is divided into sub networks. Building 11 is currently on one sub network and uses 10-bit addressing, allowing 1024 different hosts.

Host address

8 bits are finally used for host addresses within our subnet. This places a limit of 256 machines that can be on the subnet.

Total address



Figure 4.7: Total Address

The 32 bit address is usually written as 4 integers separated by dots.

Port addresses

A service exists on a host, and is identified by its port. This is a 16 bit number. To send a message to a server, you send it to the port for that service of the host that it is running on. This is not location transparency! Certain of these ports are "well known".

Sockets

A socket is a data structure maintained by the system to handle network connections. A socket is created using the call `socket`. It returns an integer that is like a file descriptor. In fact, under Windows, this handle can be used with Read File and Write File functions.

```
#include <sys/types.h>
#include <sys/socket.h>
int socket(int family, int type, int protocol);
```

Here "family" will be AF_INET for IP communications, protocol will be zero, and type will depend on whether TCP or UDP is used. Two processes wishing to communicate over a network create a socket each. These are similar to two ends of a pipe - but the actual pipe does not yet exist.

JFree Chart

JFreeChart is a free 100% Java chart library that makes it easy for developers to display professional quality charts in their applications. JFreeChart's extensive feature set includes:

A consistent and well-documented API, supporting a wide range of chart types;

A flexible design that is easy to extend, and targets both server-side and client-side applications;

Support for many output types, including Swing components, image files (including PNG and JPEG), and vector graphics file formats (including PDF, EPS and SVG);

JFreeChart is "open source" or, more specifically, free software. It is distributed under the terms of the GNU Lesser General Public Licence (LGPL), which permits use in proprietary applications.

1. Map Visualizations

Charts showing values that relate to geographical areas. Some examples include: (a) population density in each state of the United States, (b) income per capita for each country in Europe, (c) life expectancy in each country of the world. The tasks in this project include:

Sourcing freely redistributable vector outlines for the countries of the world, states/provinces in particular countries (USA in particular, but also other areas);

Creating an appropriate dataset interface (plus default implementation), a rendered, and integrating this with the existing XYPlot class in JFreeChart;

Testing, documenting, testing some more, documenting some more.

2. Time Series Chart Interactivity

Implement a new (to JFreeChart) feature for interactive time series charts --- to display a separate control that shows a small version of ALL the time series data, with a sliding "view" rectangle that allows you to select the subset of the time series data to display in the main chart.

3. Dashboards

There is currently a lot of interest in dashboard displays. Create a flexible dashboard mechanism that supports a subset of JFreeChart chart types (dials, pies, thermometers, bars, and lines/time series) that can be delivered easily via both Java Web Start and an applet.

4. Property Editors

The property editor mechanism in JFreeChart only handles a small subset of the properties that can be set for charts. Extend (or reimplement) this mechanism to provide greater end-user control over the appearance of the charts.

J2ME (Java 2 Micro edition):-

Sun Microsystems defines J2ME as "a highly optimized Java run-time environment targeting a wide range of consumer products, including pagers, cellular phones, screen-phones, digital set-top boxes and car navigation systems." Announced in June 1999 at the JavaOne Developer Conference, J2ME brings the cross-platform functionality of the Java language to smaller devices, allowing mobile wireless devices to share applications. With J2ME, Sun has adapted the Java platform for consumer products that incorporate or are based on small computing devices.

1. General J2ME architecture

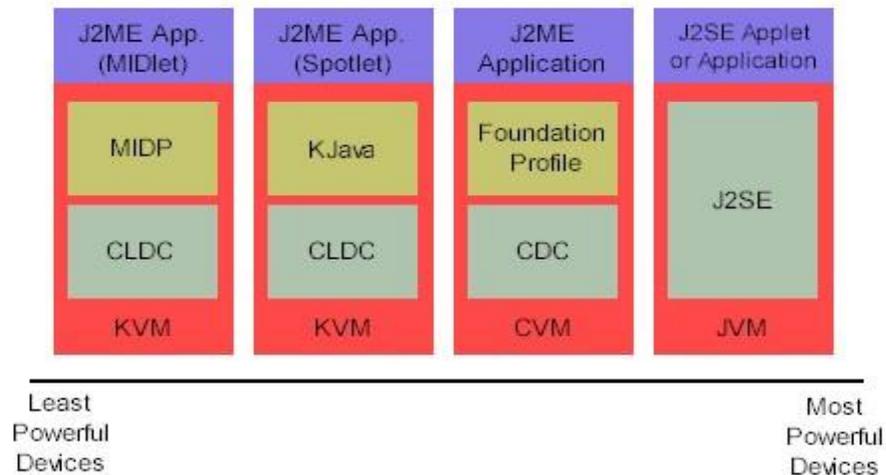


Figure 4.8: J2ME Architecture

J2ME uses configurations and profiles to customize the Java Runtime Environment (JRE). As a complete JRE, J2ME is comprised of a configuration, which determines the JVM used, and a profile, which defines the application by adding domain-specific classes. The configuration defines the basic run-time environment as a set of core classes and a specific JVM that run on specific types of devices. We'll discuss configurations in detail in the profile defines the application; specifically, it adds domain-specific classes to the J2ME configurations to define certain uses for devices. We'll cover profiles in depth in the following graphic depicts the relationship between the different virtual machines, configurations, and profiles. It also draws a parallel with the J2SE API and its Java virtual machine. While the J2SE virtual machine is generally referred to as a JVM, the J2ME virtual machines, KVM and CVM, are subsets of JVM. Both KVM and CVM can be thought of as a kind of Java virtual machine -- it's just that they are shrunken versions of the J2SE JVM and are specific to J2ME.

2. Developing J2ME applications

Introduction In this section, we will go over some considerations you need to keep in mind when developing applications for smaller devices. We'll take a look at the way the compiler is invoked when using J2SE to compile J2ME applications. Finally, we'll explore packaging and deployment and the role pre verification plays in this process.

3. Design considerations for small devices

Developing applications for small devices requires you to keep certain strategies in mind during the design phase. It is best to strategically design an application for a small device before you begin coding. Correcting the code because you failed to consider all of the "gotchas" before developing the application can be a painful process. Here are some design strategies to consider:

- * **Keep it simple.** Remove unnecessary features, possibly making those features a separate, secondary application.
- * **Smaller is better.** This consideration should be a "no brainer" for all developers. Smaller applications use less memory on the device and require shorter installation times. Consider packaging your Java applications as compressed Java Archive (jar) files.
- * **Minimize run-time memory use.** To minimize the amount of memory used at run time, use scalar types in place of object types. Also, do not depend on the garbage collector. You should manage the memory efficiently yourself by setting object references to null when you are finished with them. Another way to reduce run-time memory is to use lazy instantiation, only allocating objects on an as-needed basis. Other ways of reducing overall and peak memory use on small devices are to release resources quickly, reuse objects, and avoid exceptions.

4. Configurations overview

The conFigureuration defines the basic run-time environment as a set of core classes and a specific JVM that run on specific types of devices. Currently, two configurations exist for J2ME, though others may be defined in the future:

- * **Connected Limited Device ConFigureuration (CLDC)** is used specifically with the KVM for 16-bit or 32-bit devices with limited amounts of memory. This is the conFigureuration (and the virtual machine) used for developing small J2ME applications. Its size limitations make CLDC more interesting and challenging (from a development point of view) than CDC. CLDC is also the conFigureuration that we will use for developing our drawing tool application. An example of a small wireless device running small applications is a Palm hand-held computer.

* **Connected Device ConFigureuration (CDC)** is used with the C virtual machine (CVM) and is used for 32-bit architectures requiring more than 2 MB of memory. An example of such a device is a Net TV box.

5. J2ME profiles

What is a J2ME profile?

As we mentioned earlier in this tutorial, a profile defines the type of device supported. The Mobile Information Device Profile (MIDP), for example, defines classes for cellular phones. It adds domain-specific classes to the J2ME conFigureuration to define uses for similar devices. Two profiles have been defined for J2ME and are built upon CLDC: KJava and MIDP. Both KJava and MIDP are associated with CLDC and smaller devices. Profiles are built on top of configurations. Because profiles are specific to the size of the device (amount of memory) on which an application runs, certain profiles are associated with certain configurations.

A skeleton profile upon which you can create your own profile, the Foundation Profile, is available for CDC.

Profile 1: KJava

KJava is Sun's proprietary profile and contains the KJava API. The KJava profile is built on top of the CLDC configuration. The KJava virtual machine, KVM, accepts the same byte codes and class file format as the classic J2SE virtual machine. KJava contains a Sun-specific API that runs on the Palm OS. The KJava API has a great deal in common with the J2SE Abstract Windowing Toolkit (AWT). However, because it is not a standard J2ME package, its main package is `com.sun.kjava`. We'll learn more about the KJava API later in this tutorial when we develop some sample applications.

Profile 2: MIDP

MIDP is geared toward mobile devices such as cellular phones and pagers. The MIDP, like KJava, is built upon CLDC and provides a standard run-time environment that allows new applications and services to be deployed dynamically on end user devices. MIDP is a common, industry-standard profile for mobile devices that is not dependent on a specific vendor. It is a complete and supported foundation for mobile

applicationdevelopment. MIDP contains the following packages, the first three of which are core CLDC packages, plus three MIDP-specific packages.

* java.lang

* java.io

* java.util

* javax.microedition.io

* javax.microedition.lcdui

* javax.microedition.midlet

* javax.microedition.rms

5. SAMPLE CODE

Document : login action

```
<% @page import="java.util.UUID"%>

<% @page import="java.security.SecureRandom"%>

<% @page import="java.sql.ResultSet"%>

<% @page import="Dbcon.DbConnection"%>

<% @page import="java.sql.Statement"%>

<% @page import="java.sql.Connection"%>

<% @page import="java.util.Random"%>

<% @page import="algorithm.CiperText"%>

<%

    Connection con = null;

    Statement st = null;

ResultSets = null;

    String name = request.getParameter("name");

    String pass = request.getParameter("pass");

    String Eamil = request.getParameter("email");

    String dob = request.getParameter("dob");

    String Gender = request.getParameter("gen");

    String phone = request.getParameter("phone");

    String State = request.getParameter("state");

    String Country = request.getParameter("country");
```

```

String secret = request.getParameter("secret");

System.out.println("User Details" + phone + Gender + dob + State + Eamil + name +
pass + Country);

String skey = request.getParameter("skey1");

String skey2 = request.getParameter("skey2");

System.out.println("Skey: " + skey+ "Skey2: "+skey2);

session.setAttribute("secret_key1", skey);

int status = Integer.parseInt(request.getParameter("status"));

try {

con = DbConnection.getConnection();

st = con.createStatement();

switch (status) {

case 1:

try {

rs = st.executeQuery("select * from reg where name='" + name + "' AND pass='" + pass
+ "'");

if (rs.next()) {

session.setAttribute("sssname", rs.getString("name"));

session.setAttribute("sssemail", rs.getString("email"));

session.setAttribute("sssstate", rs.getString("state"));

session.setAttribute("ssscountry", rs.getString("country"));

response.sendRedirect("uhome.jsp?msg=success");

} else {

```

```
response.sendRedirect("user.jsp?msgg=failed");

        }

        } catch (Exception ex) {

ex.printStackTrace();

        }

break;

case 2:

try {

con = DbConnection.getConnection();

st = con.createStatement();

inti = st.executeUpdate("insert into reg(name, pass, email, dob, gen, phone, state,
country) values ('" + name + "','" + pass + "','" + Eamil + "','" + dob + "','" + Gender +
','" + phone + "','" + State + "','" + Country + "')");

if (i != 0) {

response.sendRedirect("reg.jsp?msg=success");

        } else {

response.sendRedirect("reg.jsp?msgg=failed");

        }

        } catch (Exception ex) {

ex.printStackTrace();

        }

break;

case 3:
```

```
try {  
  
if (name.equalsIgnoreCase("server1") &&pass.equalsIgnoreCase("server1")) {  
  
response.sendRedirect("ser_home.jsp?msg=success");  
  
        } else {  
  
response.sendRedirect("server1.jsp?msgg=failed");  
  
        }  
  
        } catch (Exception ex) {  
  
ex.printStackTrace();  
  
        }  
  
break;  
  
case 4:  
  
try {  
  
if (name.equalsIgnoreCase("server2") &&pass.equalsIgnoreCase("server2")) {  
  
response.sendRedirect("server_home.jsp?msg=success");  
  
        } else {  
  
response.sendRedirect("server2.jsp?msgg=failed");  
  
        }  
  
        } catch (Exception ex) {  
  
ex.printStackTrace();  
  
        }  
  
break;  
  
case 5:  
  
try {
```

```
rs = st.executeQuery("select * from ser where skey="" + skey + "" AND skey1="" +
skey2 + "");

if (rs.next()) {

response.sendRedirect("download.jsp?msg=success");

        } else {

response.sendRedirect("down.jsp?msgg=failed");

        }

        } catch (Exception ex) {

ex.printStackTrace();

        }

break;

case 6:

try {

rs = st.executeQuery("select * from upload where fileaccess="" + pass + "");

if (rs.next()) {

session.setAttribute("passd", pass);

response.sendRedirect("download.jsp?msg=success");

        } else {

response.sendRedirect("down.jsp?msgg=failed");

        }

        } catch (Exception ex) {

ex.printStackTrace();

        }
```

```
break;

default:

response.sendRedirect("index.html");

    }

    } catch (Exception ex) {

ex.printStackTrace();

    }

%>

+
```

6. SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub assemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

6.1 TYPES OF TESTS

1. Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

2. Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfactory, as shown by successful unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

3. Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

- Valid Input : identified classes of valid input must be accepted.
- Invalid Input : identified classes of invalid input must be rejected.
- Functions : identified functions must be exercised.
- Output : identified classes of application outputs must be exercised.
- Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

6.2 System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

1. White Box Testing

White Box Testing is a testing in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is used to test areas that cannot be reached from a black box level.

2. Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot “see” into it. The test provides inputs and responds to outputs without considering how the software works.

6.2.1 Unit Testing:

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

6.2.2 Integration Testing

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects. The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

6.2.3 Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

7. OUTPUT SCREENS

Home Page:



Screen 1: Home Page

Registration:

New User Registration | Page - UC Browser
localhost:8084/Dual_Server_Pul

Dual-Server Public-Key Encryption With Keyword Search for Secure Cloud Storage

HOME USER SERVER 1 SERVER 2 REGISTRATION

Registration

kavi ...

kaviarasanjpinfotech@gmail.com 08/30/2016

Male 9787279591

Pondy India

Register Reset

© 2017 Template by JPIFOTeCH

12:52 PM 9/12/2016

Screen 2: Registration

Sender login:

User Login | Page - UC Browser
localhost:8084/Dual_Server_Pul

Dual-Server Public-Key Encryption With Keyword Search for Secure Cloud Storage

HOME USER SERVER 1 SERVER 2 REGISTRATION

User Login !

kavi ...

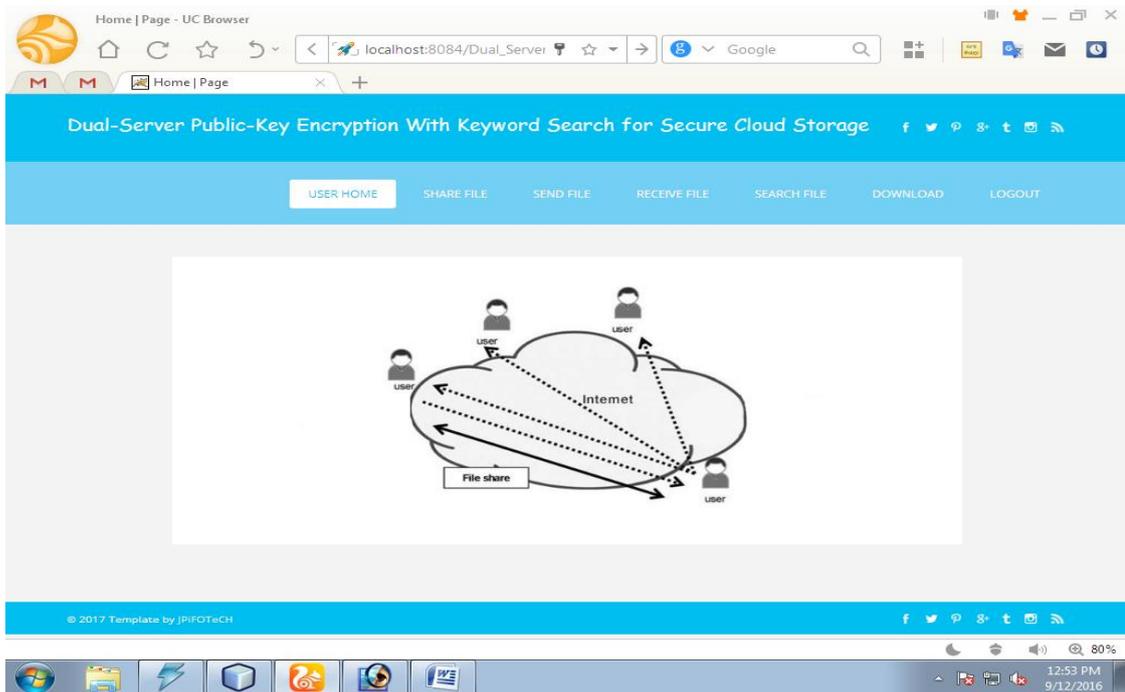
Login Reset

© 2017 Template by JPIFOTeCH

12:53 PM 9/12/2016

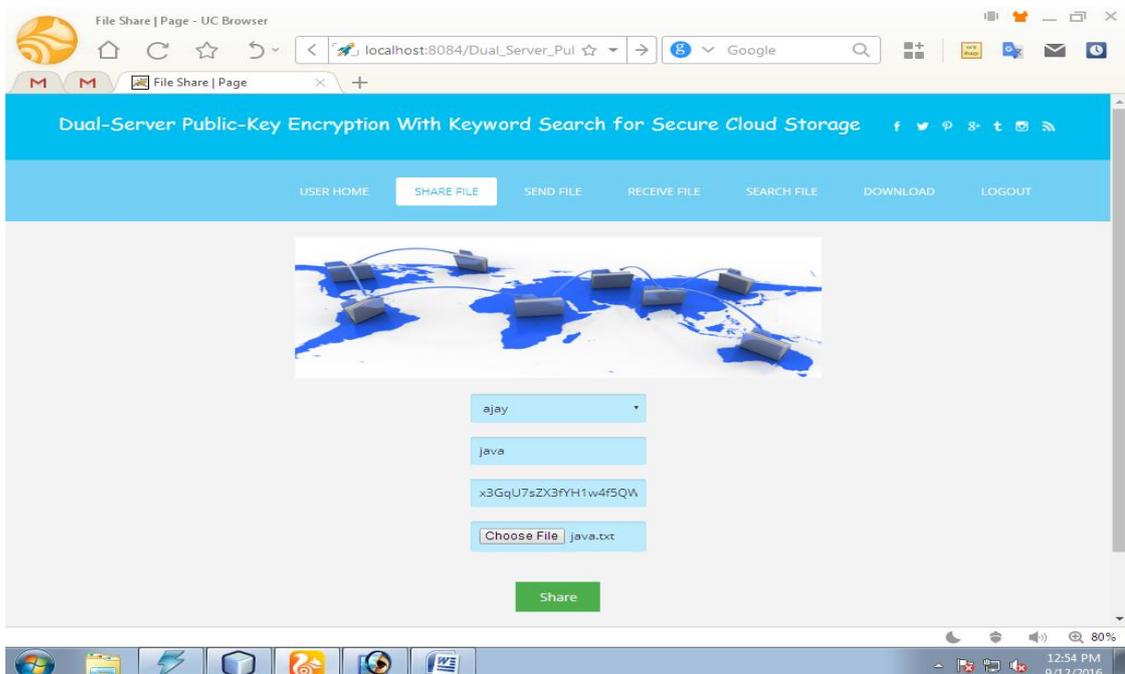
Screen 3: Sender Login

User Home:



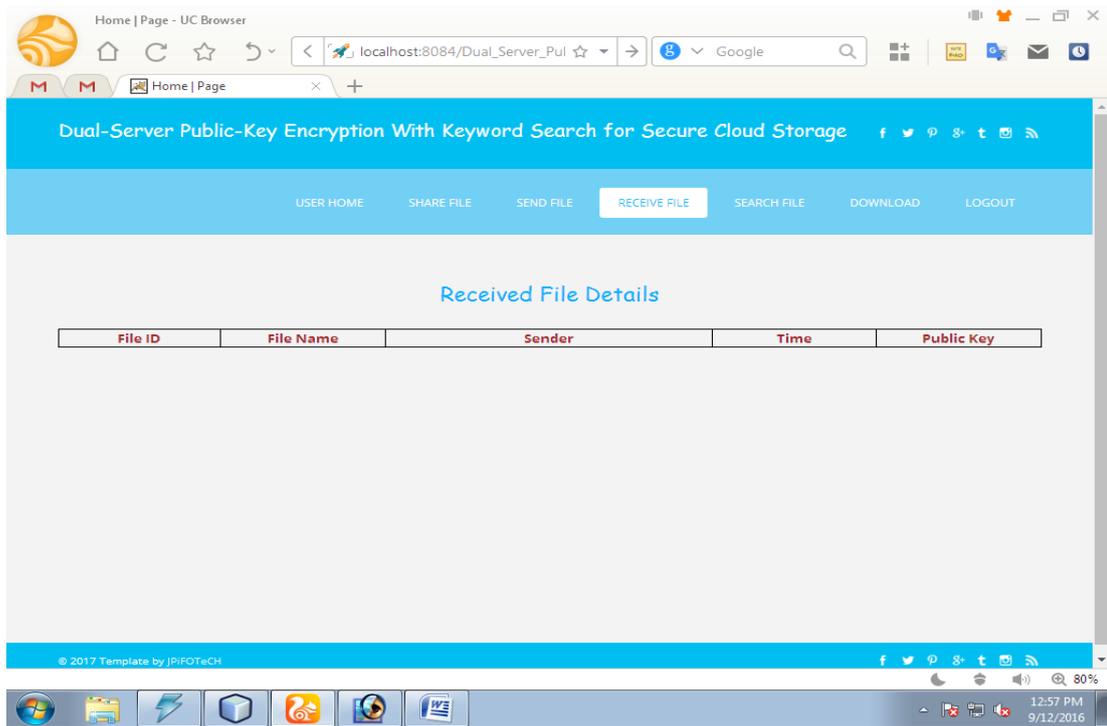
Screen 4: User Home

ShareFile:

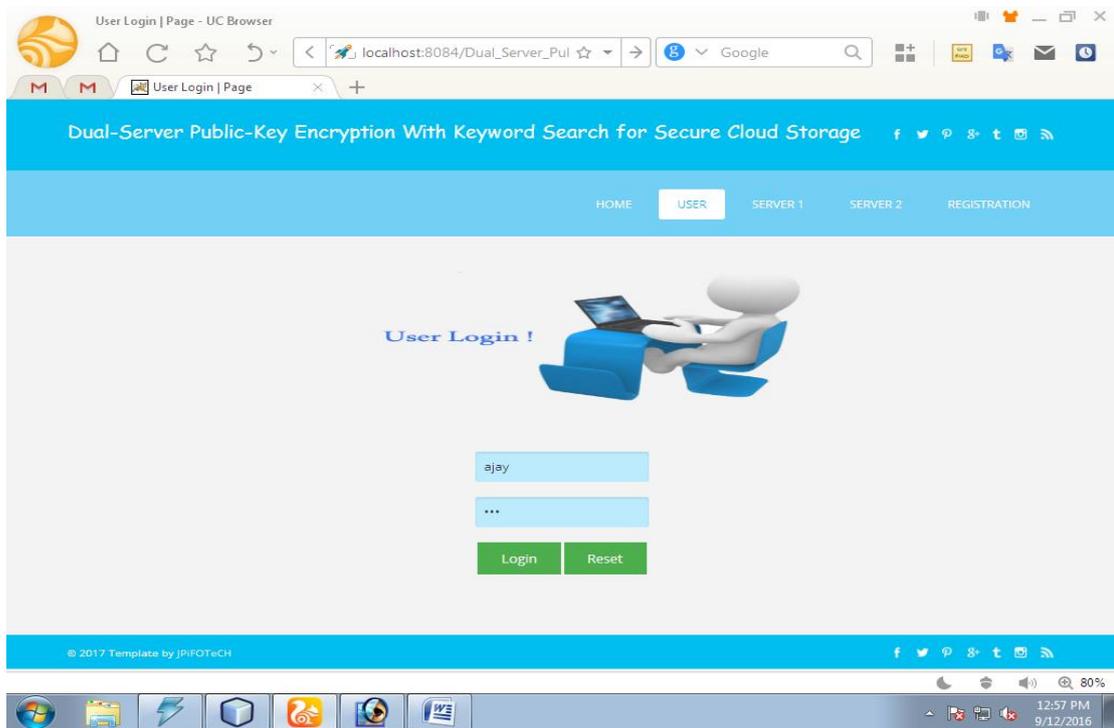


Screen 5: Share File

Receiverlogin:

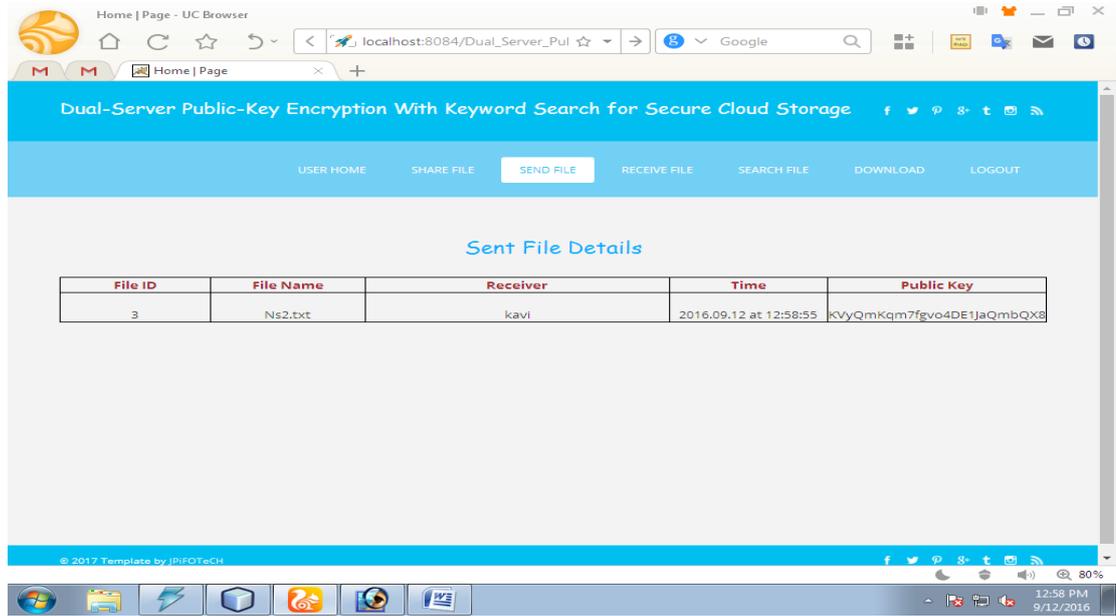


Screen 6: Receiver Login



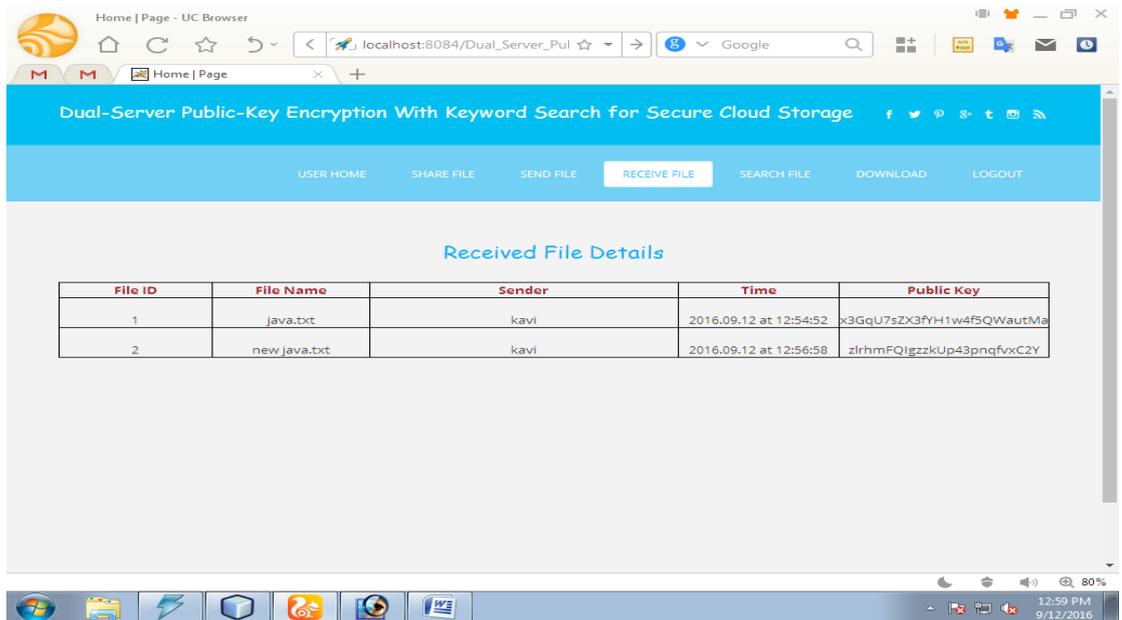
Screen 7: Receiver login for user 1

Sent File details:



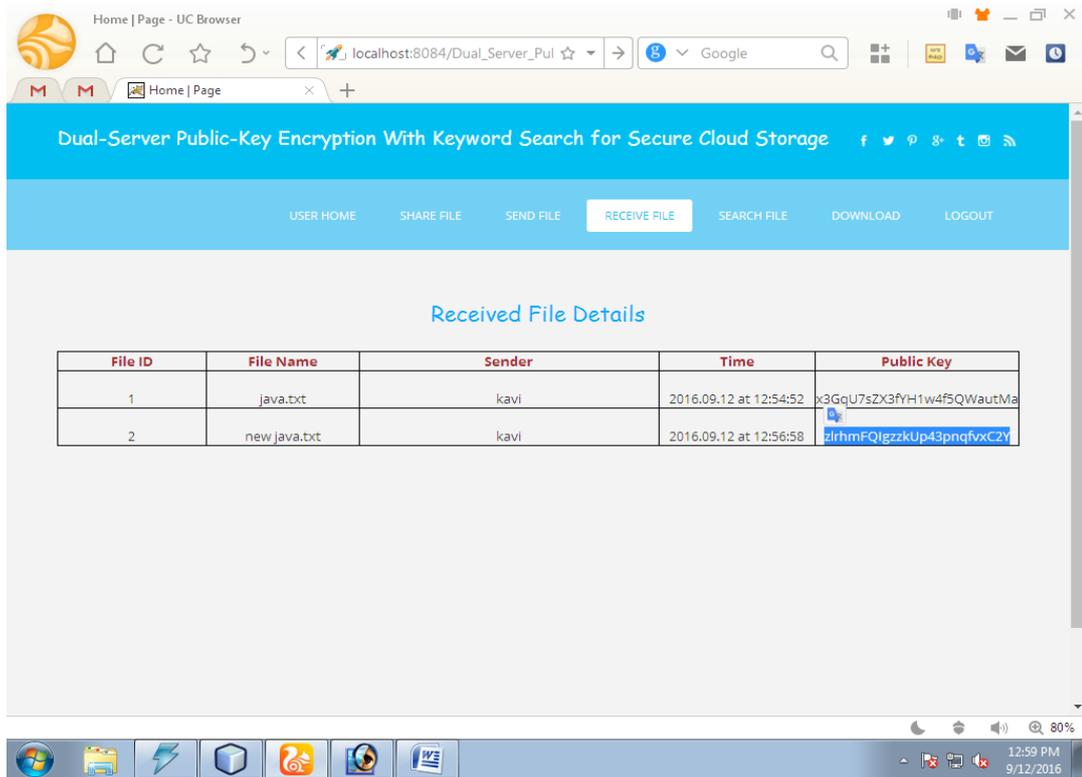
Screen 8: Sent file details

Received File details:



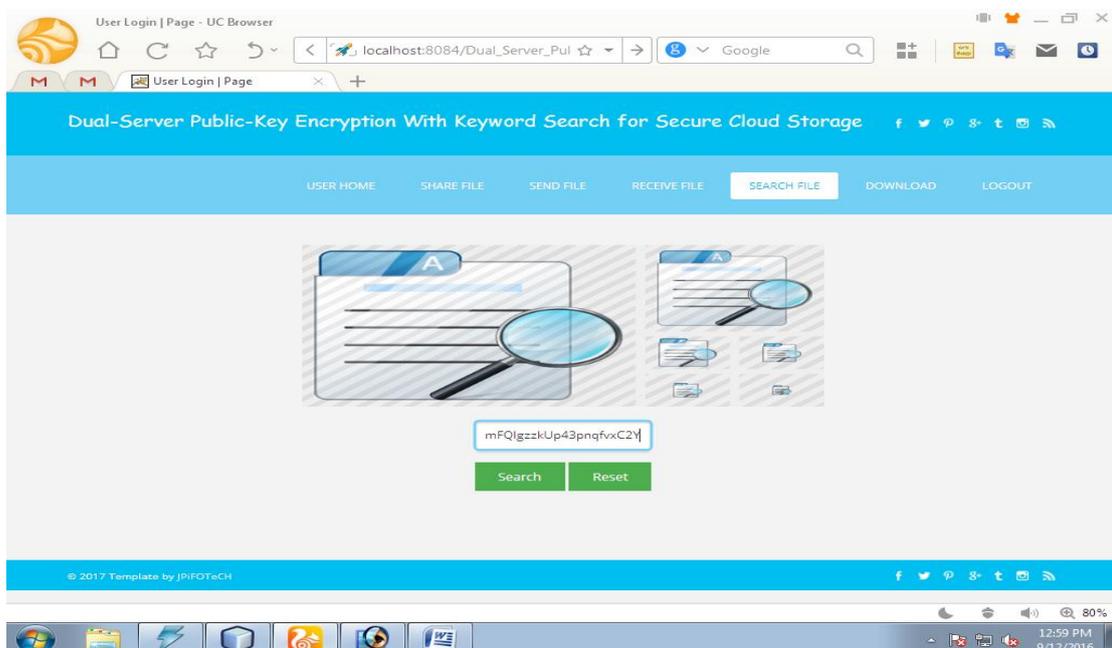
Screen 9: Received file details

DUAL SERVER PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH



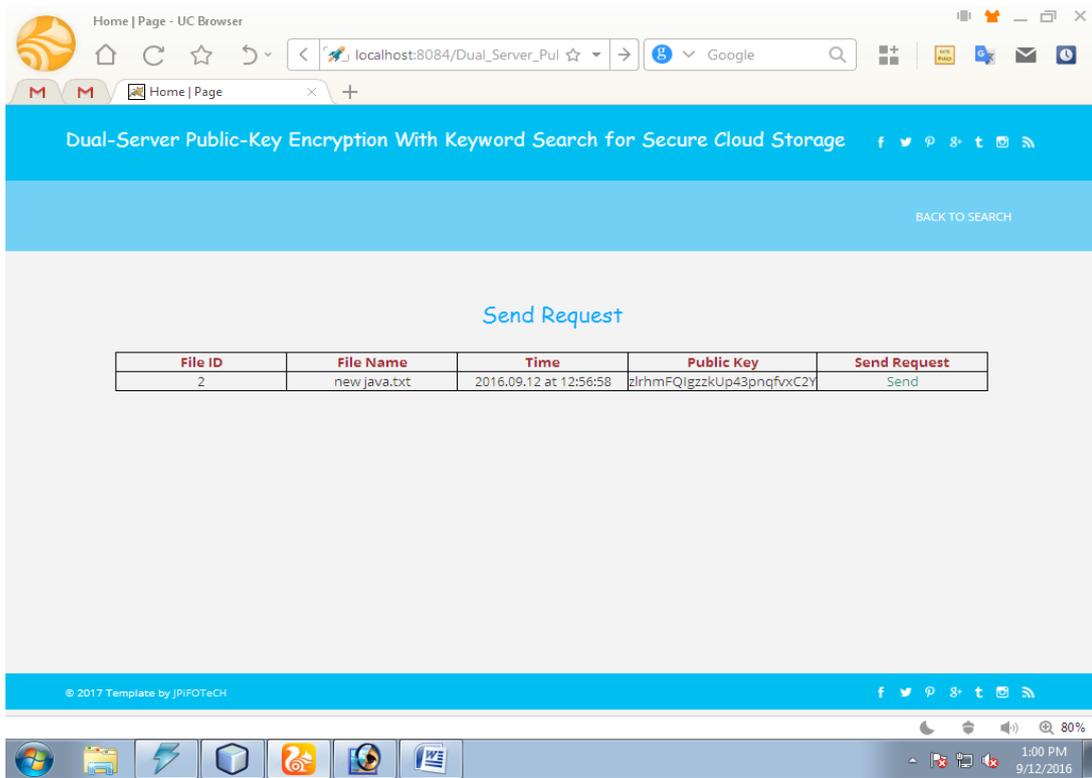
Screen 10: Received file public key copying

Search File:



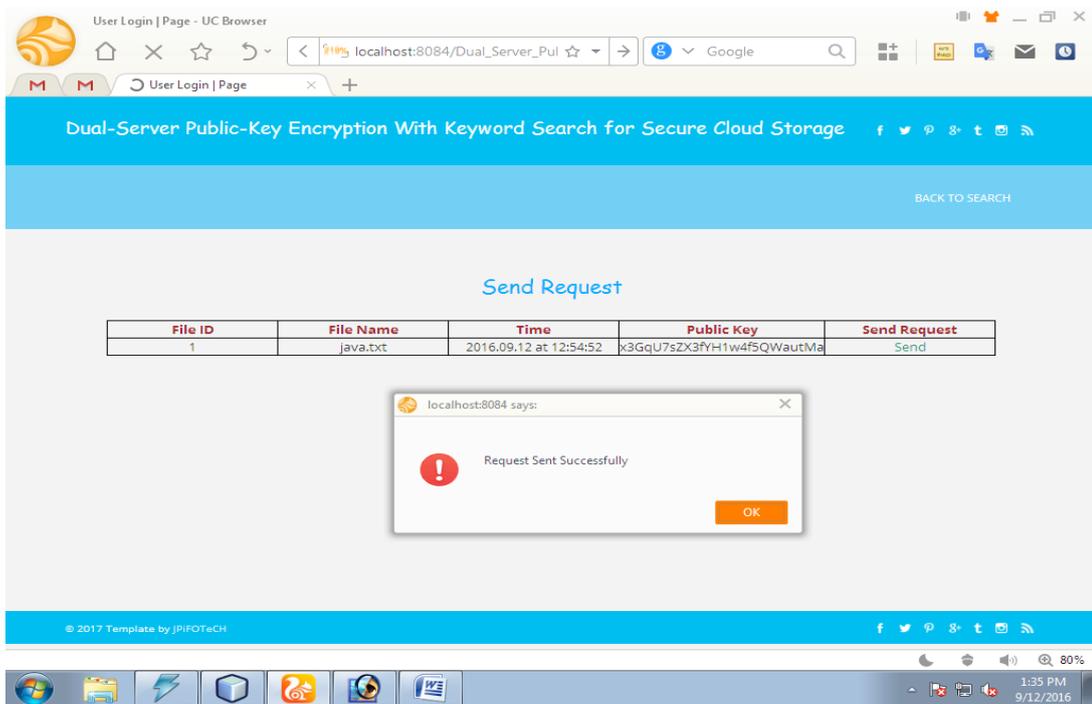
Screen 11: Search file

Send request:



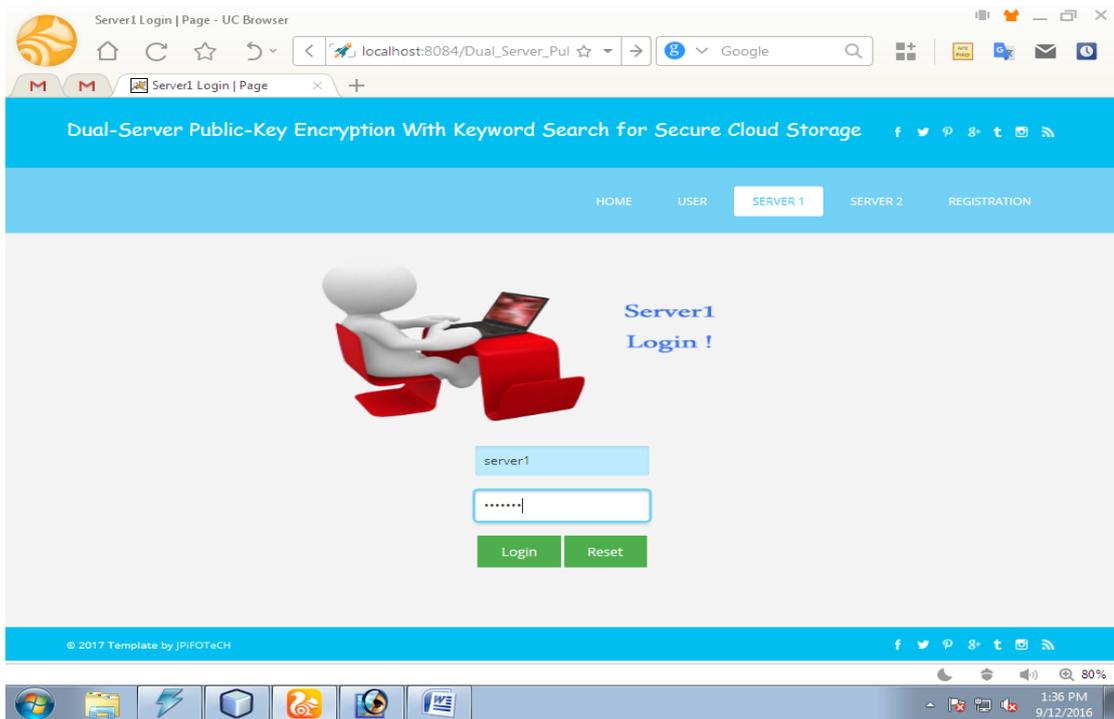
Screen 12: Send Request

Request Sent:



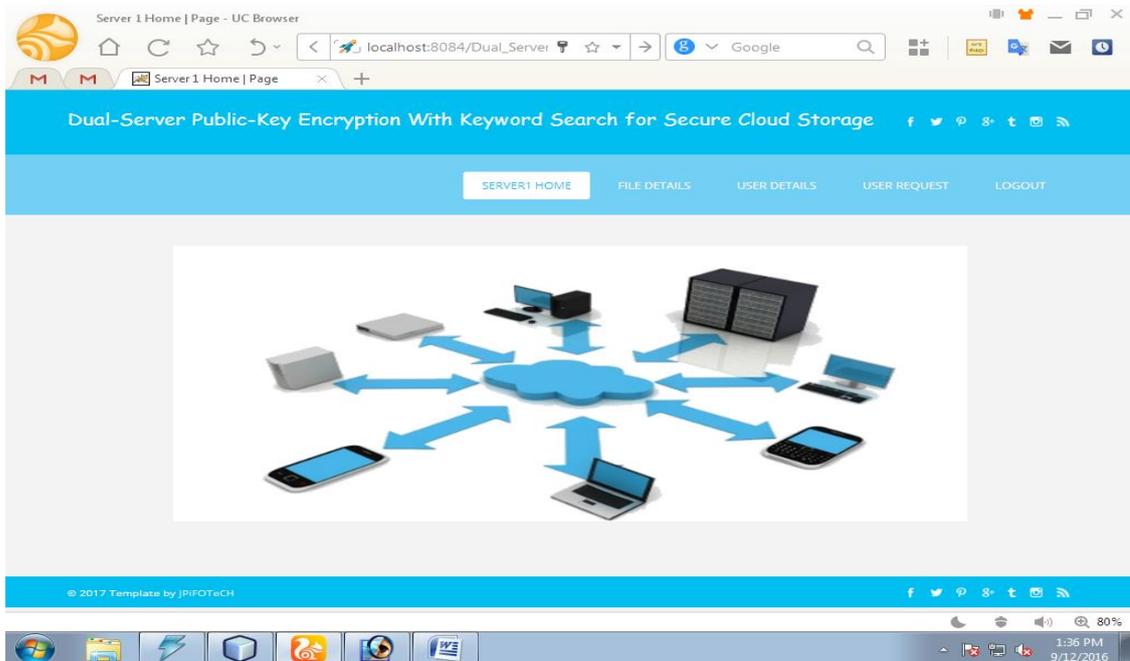
Screen 13: Request sent

Server1:



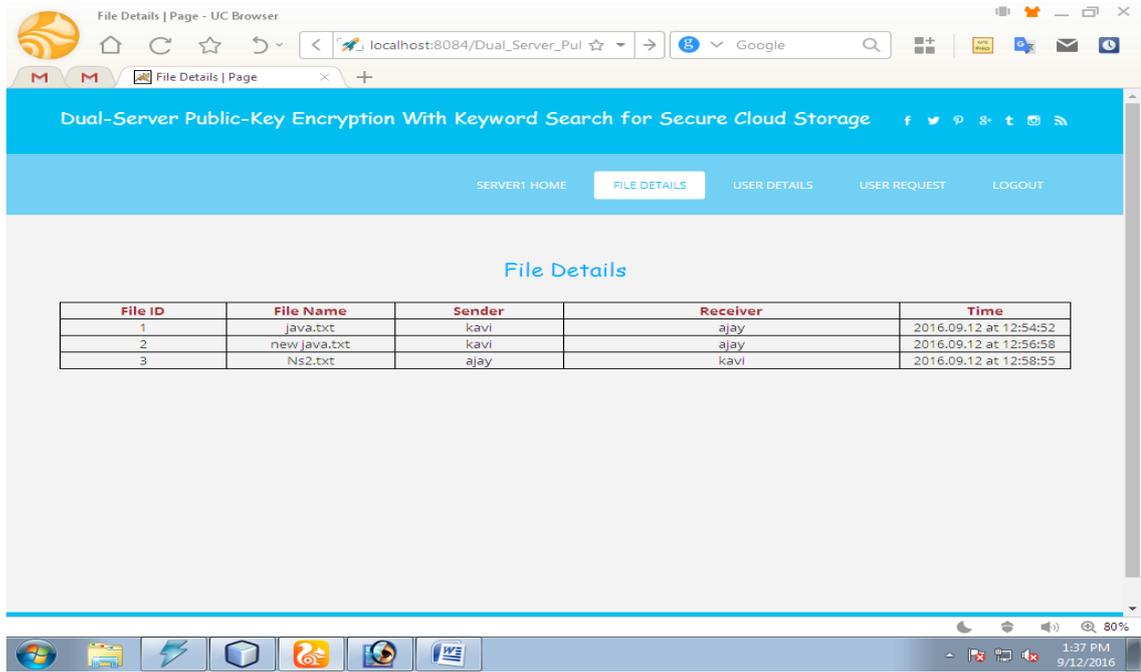
Screen14: Server 1

Server1 Home:



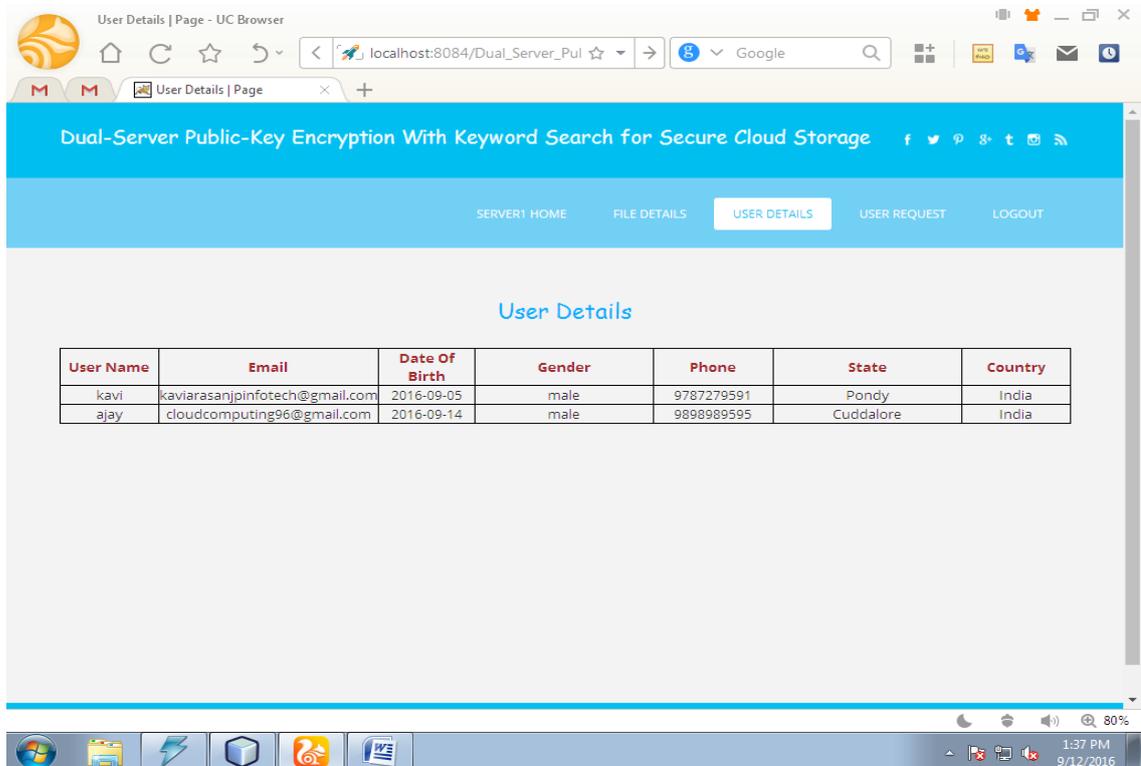
Screen 15: Server 1 Home

File details:



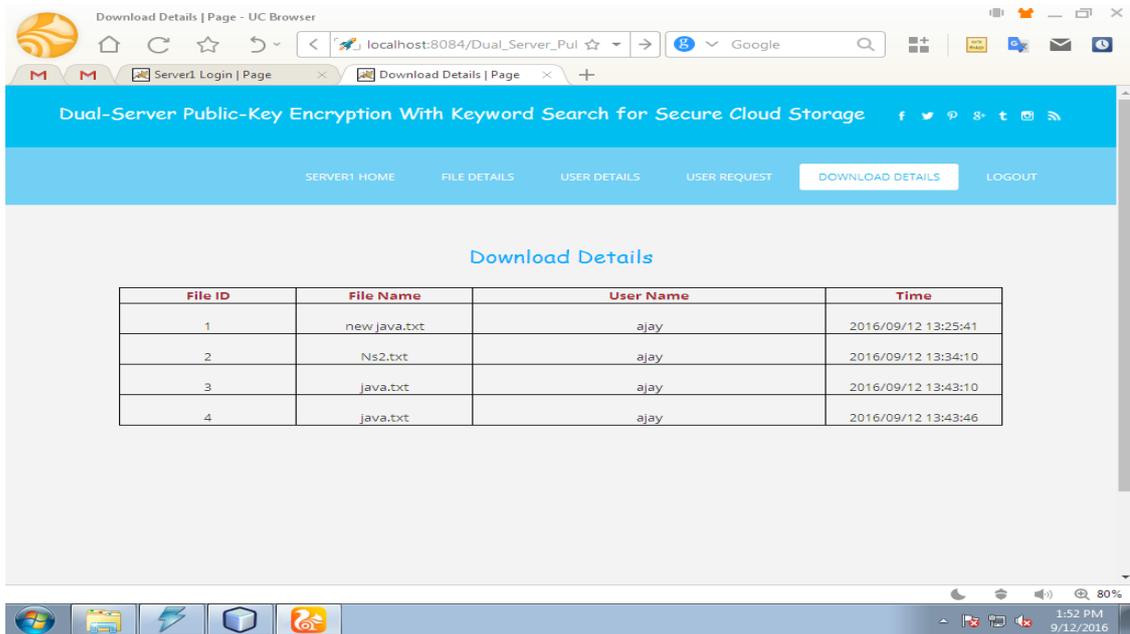
Screen 16: File Details

User Details:



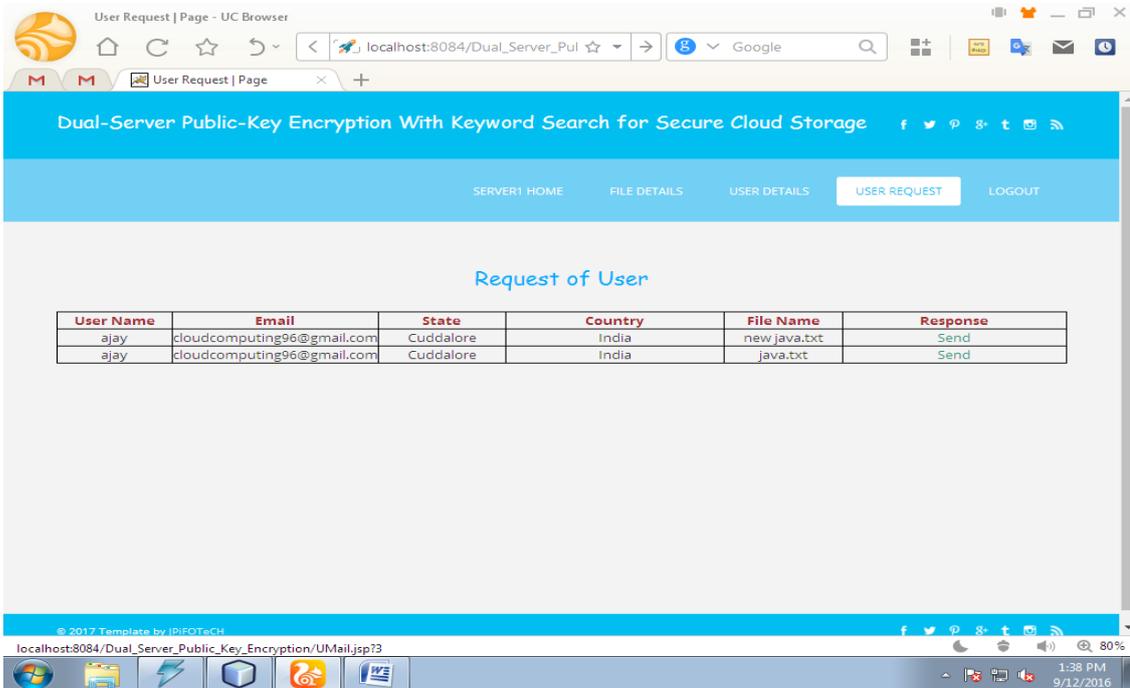
Screen 17: User Details

Download Details:



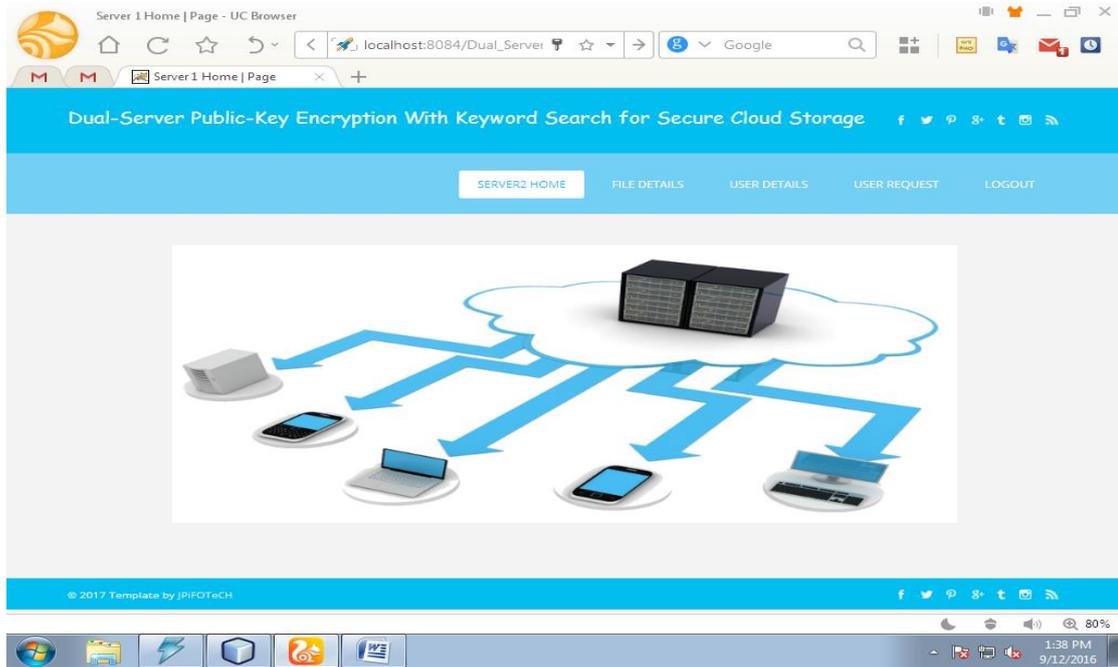
Screen 18: Download Details

User Request:



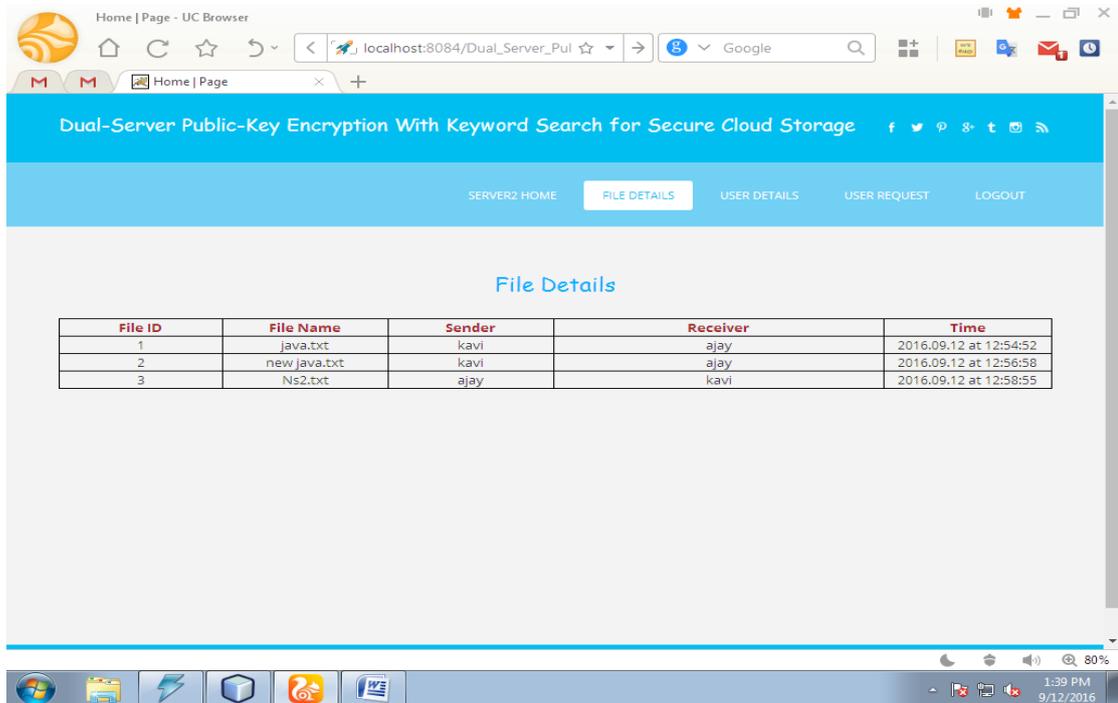
Screen 19: User Request

Server2 Home:



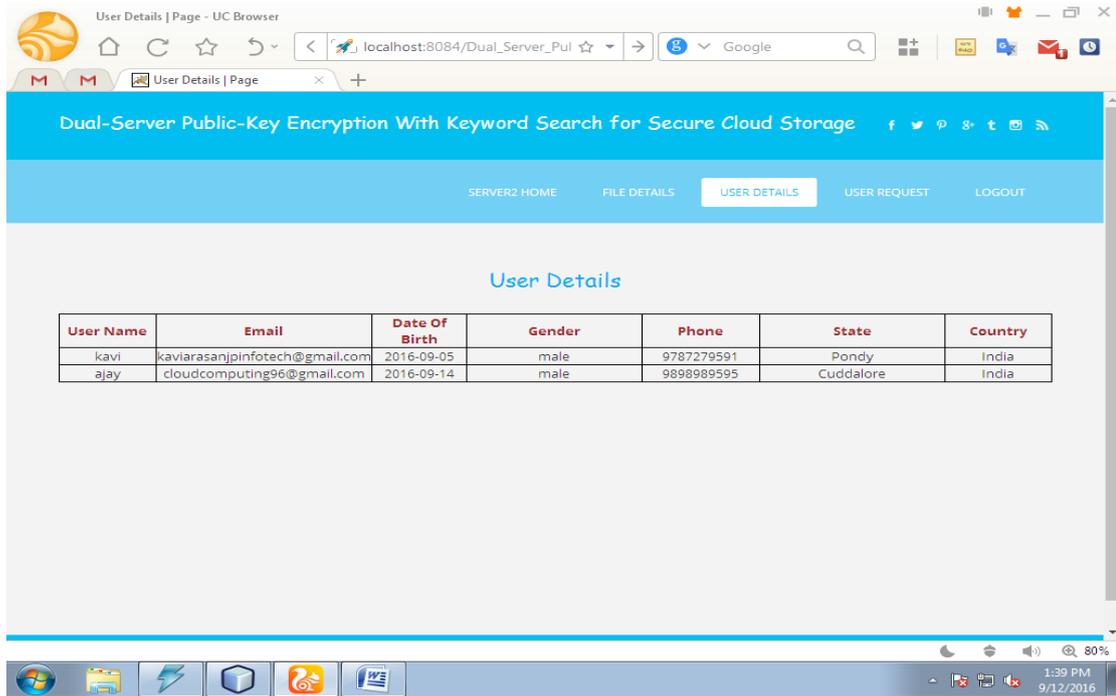
Screen 20: Server2 Home

File details:



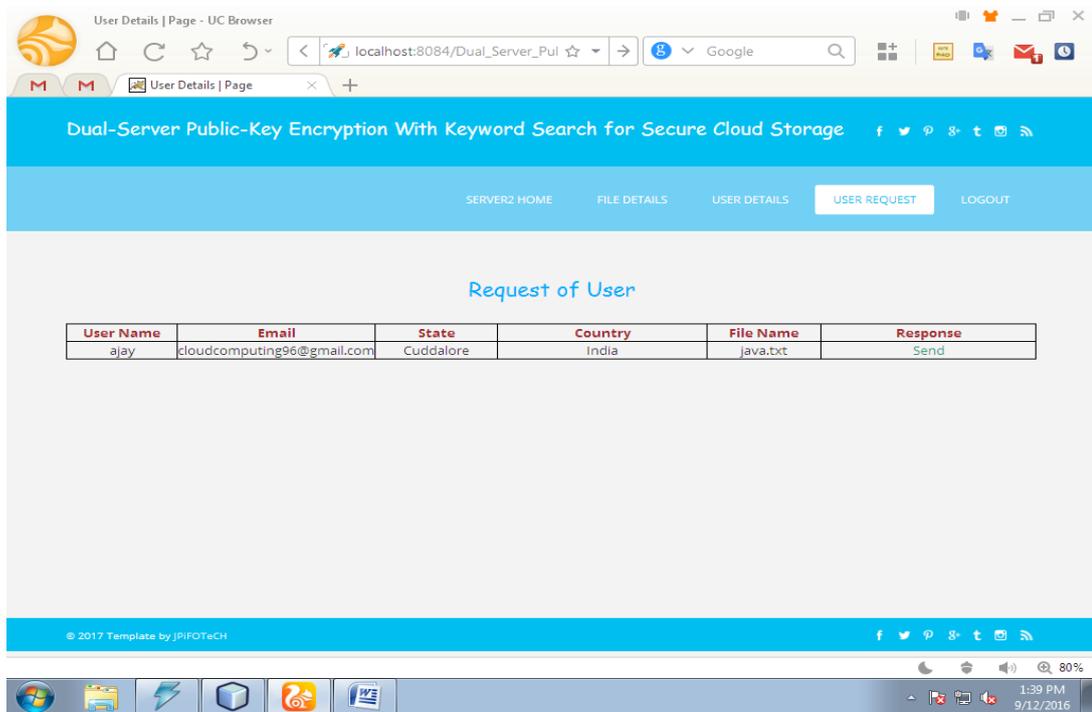
Screen 21: File Details

User Details:



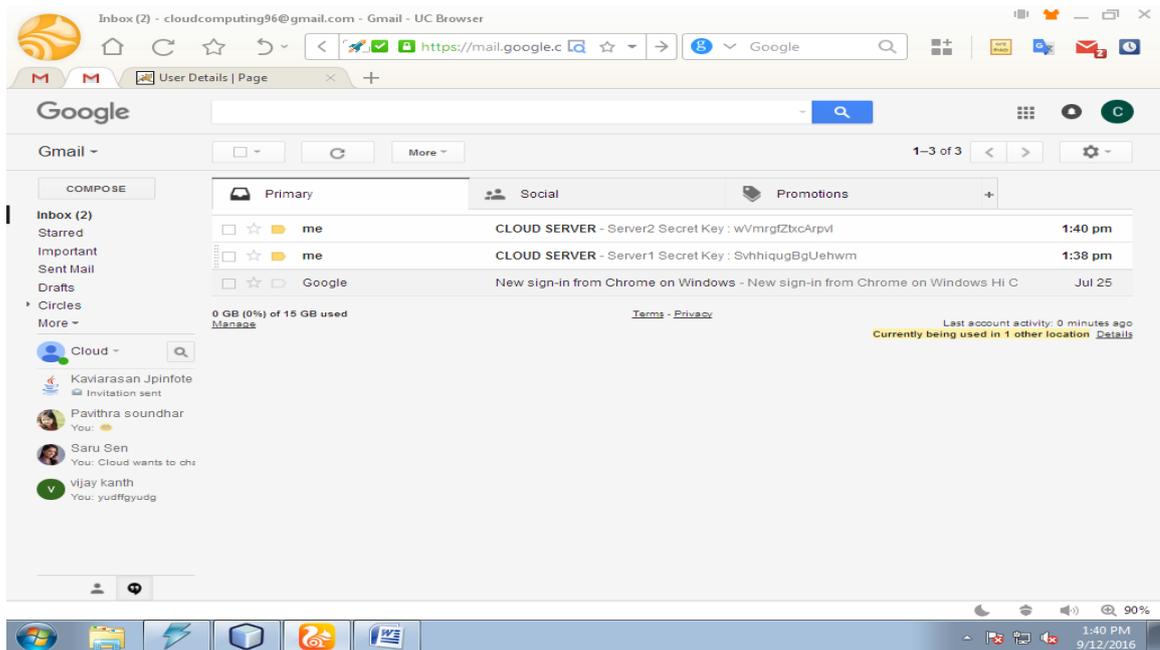
Screen 22: User Details

User request:



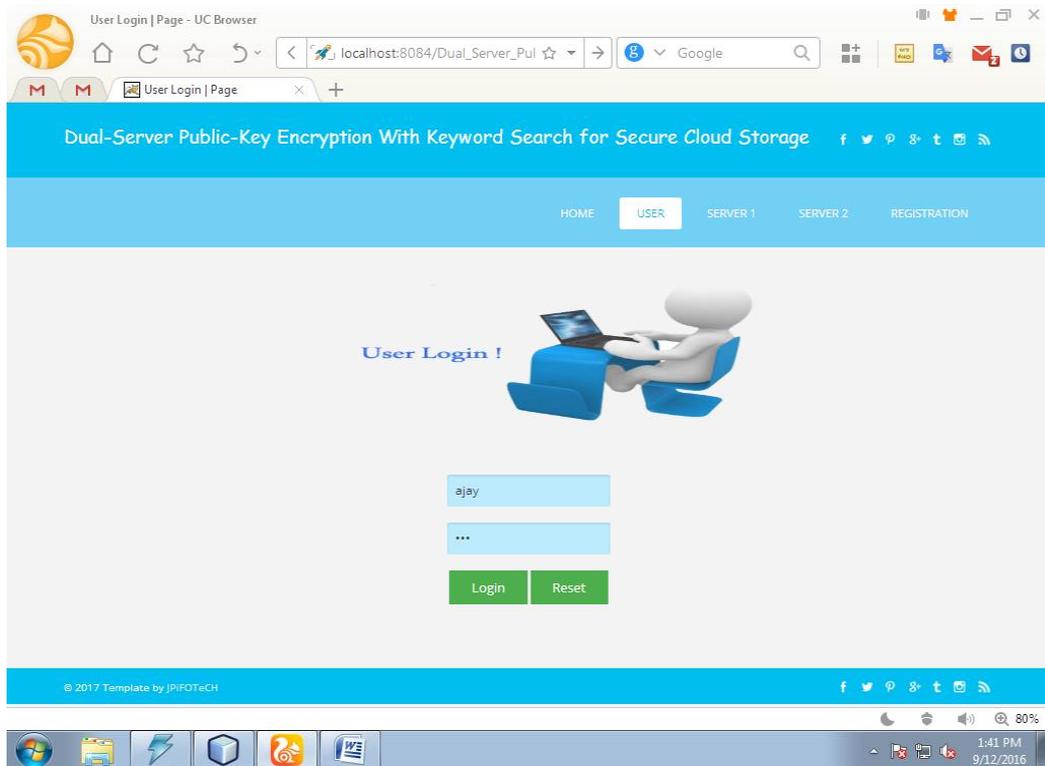
Screen 23: User Request

Email:



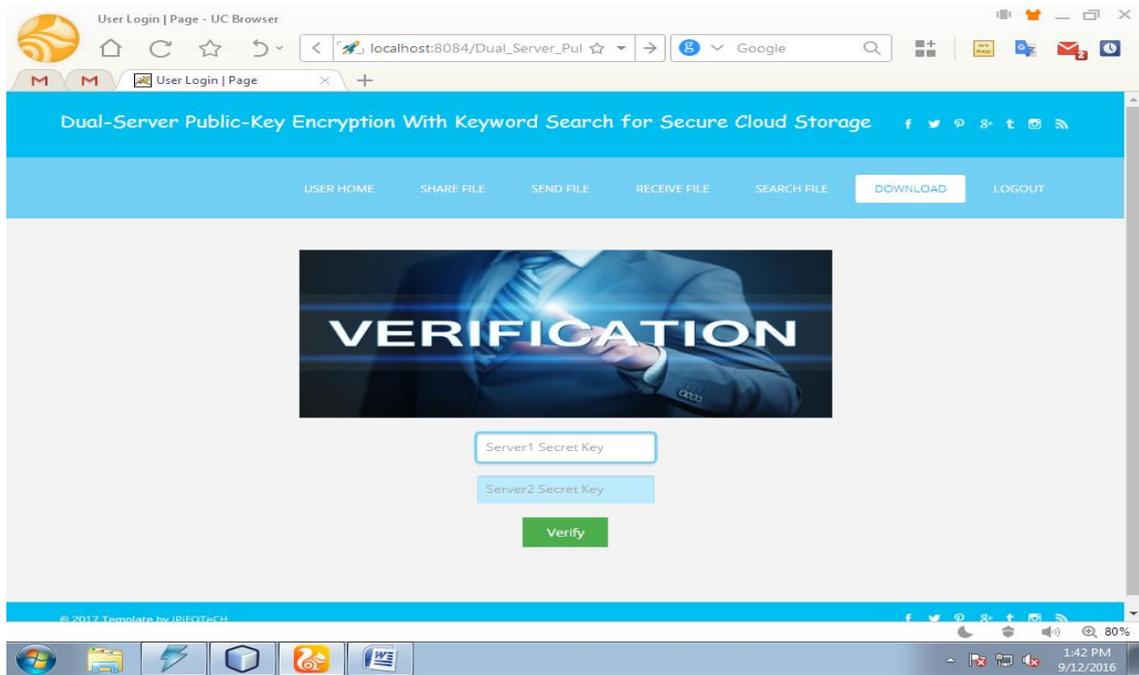
Screen 24: Email

User Login:



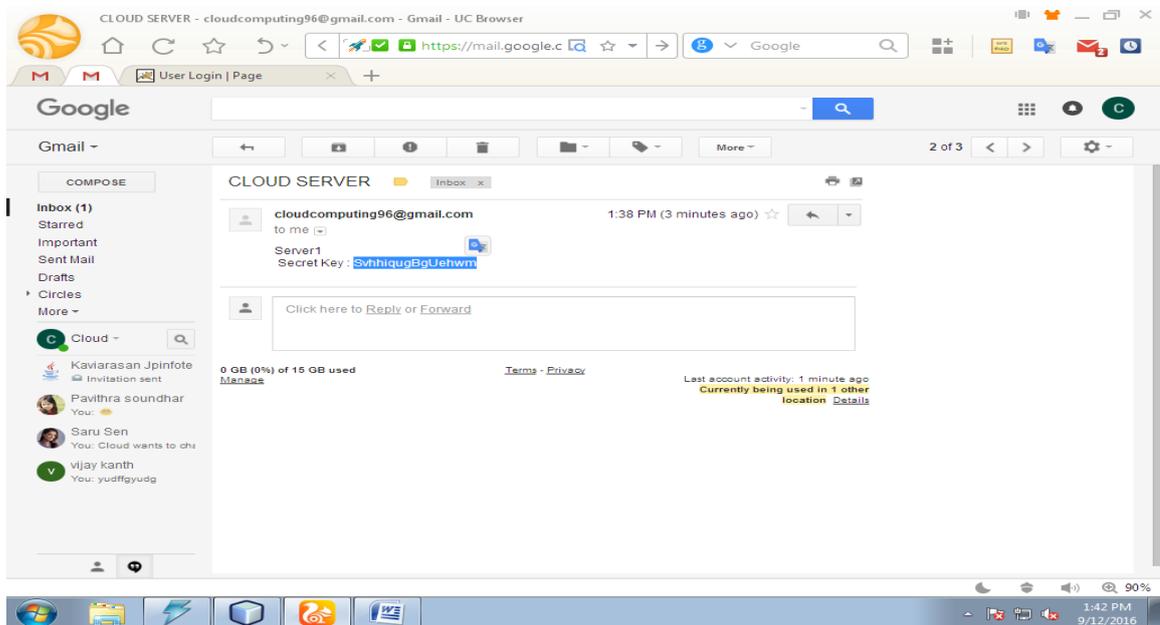
Screen 25: User Login

Verification:



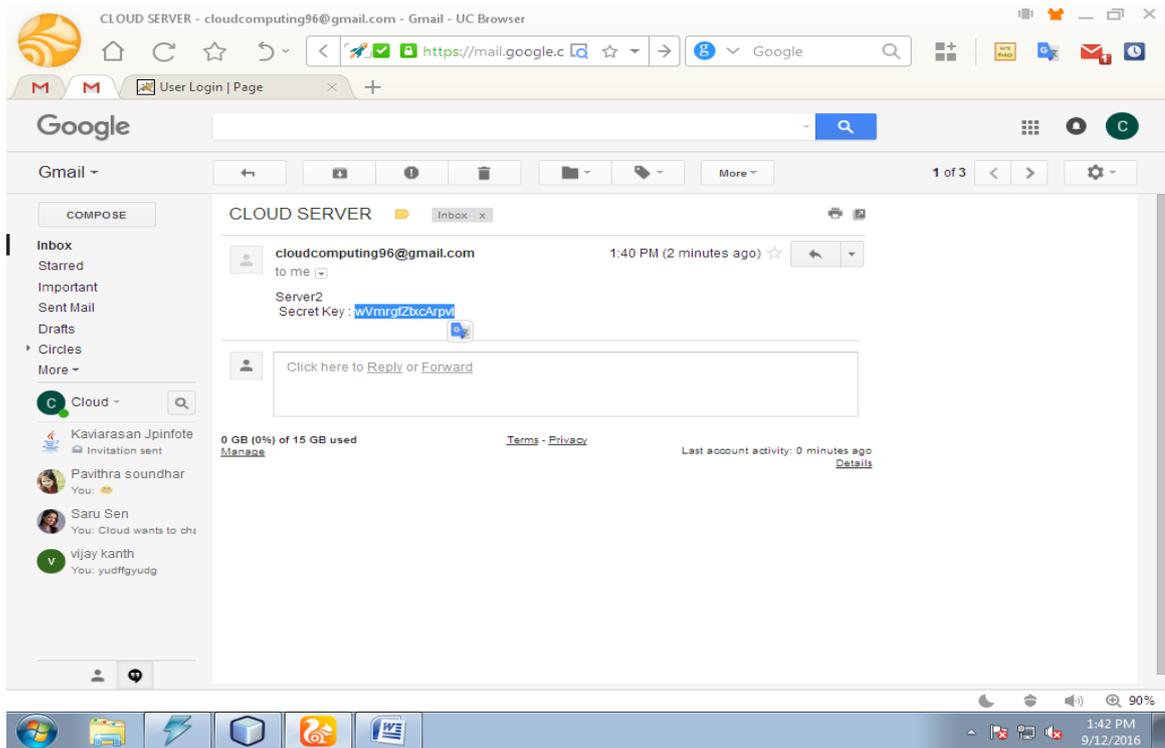
Screen 26 : Verification

Secretkey Generation:

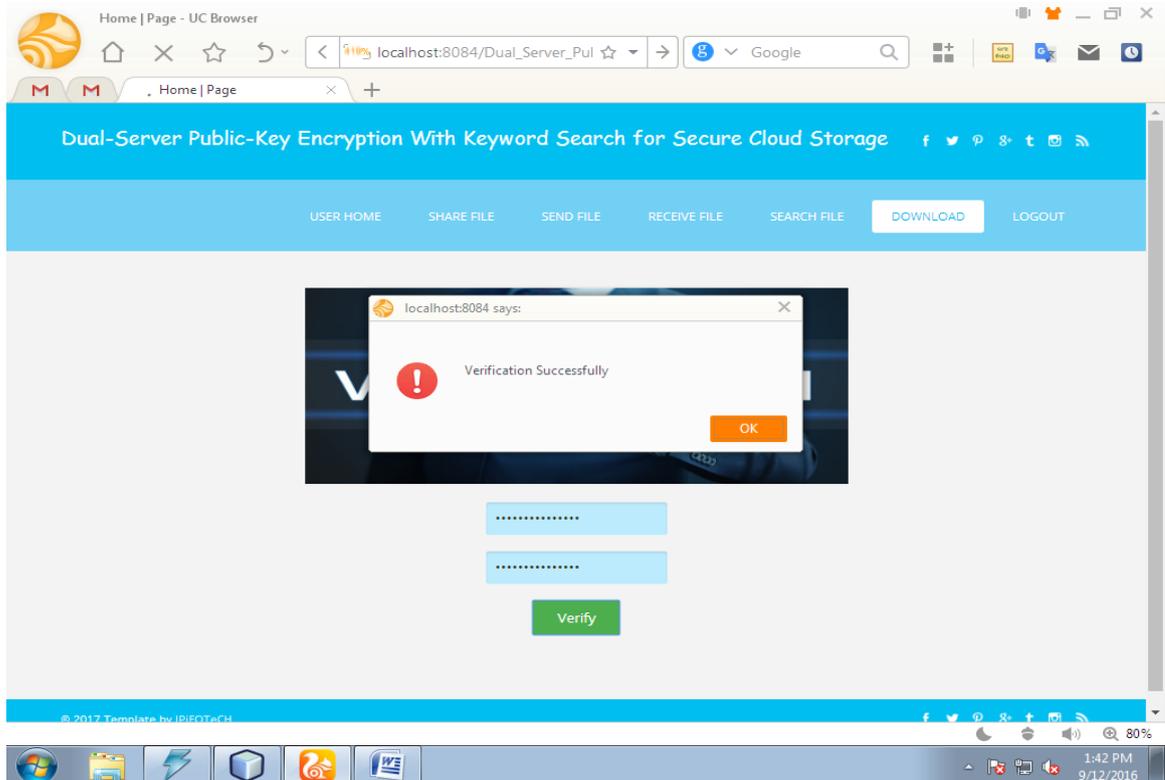


Screen 27 : secretKey Generation

DUAL SERVER PUBLIC KEY ENCRYPTION WITH KEYWORD SEARCH

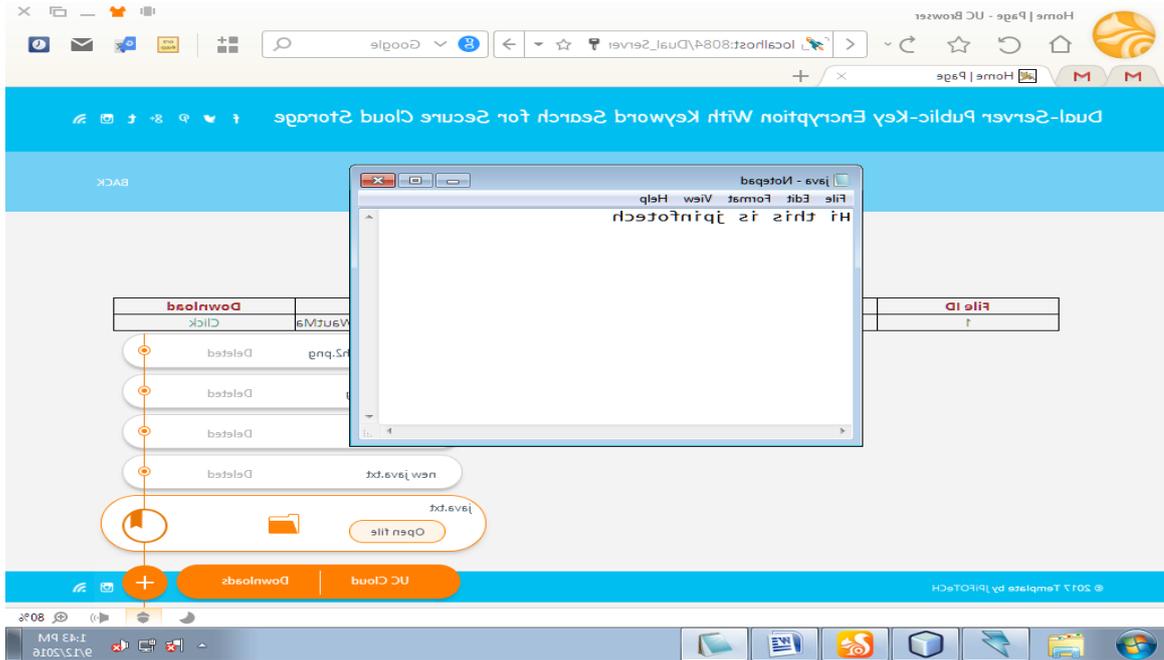


Verified page:



Screen 28: Verified page

Text file:



Screen 29: Text file

8. CONCLUSION

In this project, we proposed a new framework, named Dual-Server Public Key Encryption with Keyword Search (DS-PEKS), that can prevent the inside keyword guessing attack which is an inherent vulnerability of the traditional PEKS framework. We also introduced a new Smooth Projective Hash Function (SPHF) and used it to construct a generic DS-PEKS scheme. An efficient instantiation of the new SPHF based on the Diffie-Hellman problem is also presented in the paper, which gives an efficient DS-PEKS scheme without pairings.

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1. INTRODUCTION

E-LEARNING platforms are complex systems aimed at efficiently supporting learning activities with the help of electronic devices (e.g. laptops, tablets, mobile phones). Compared to traditional approaches to learning, they simplify the interaction between teachers and learners [1], because they allow (i) sharing electronic teaching materials with multiple users, (ii) access video lectures and other teaching content through electronic devices (PCs, laptops, tablets, mobile phones), and (iii) exchanging feedbacks on practices, exercises, or theoretical lessons through dedicated communication channels. The most commonly shared electronic teaching materials are textual documents [2]. They encompass lecture notes, e-books, scientific articles, or technical reports. However, due to the ever increasing amount of electronic documents retrievable from heterogeneous sources, the manual inspection of these teaching materials may become practically unfeasible. Hence, there is a need for automated analytics solutions to analyse electronic teaching content and to automatically infer potentially useful information.

In this project we address the issue of automatically generating document highlights. Highlights are graphical signs that are usually exploited to mark part of the textual content. For example, the most significant parts of the text can be underlined, coloured, or circled. The importance of text highlights in learning activities has been confirmed by previous studies on educational psychology (e.g. [3]) and visual document analysis (e.g. [4]). The highlighted documents can be easily shared between teachers and learners through e-learning platforms [2]. However, the manual generation of text highlights is time-consuming, i.e., it cannot be applied to very large document collections without a significant human effort, and prone to errors for learners who have limited knowledge on the document subject. Automating the process of text highlighting requires generating advanced analytical models able to (i) capture the underlying correlations between textual contents and (ii) scale towards large document collections. The contribution of this project is twofold: (1) It proposes to use text classification techniques to automate the process of highlighting learning documents. (2) It considers the proficiency level of the highlighting users to drive the generation of new highlights.

Nearest Keyword Set Search In Multidimensional Datasets

Objective 1 - Highlight generation based on classification techniques. Given a set of partially highlighted learning documents we aim at automatically generating new highlights by applying classification techniques. Classifiers are established data mining algorithms which have found application in various application domains. Their applicability to textual data is established [5]. Starting from a set of manually highlighted sentences, we build an abstract model, called classifier, which incorporates all the salient information needed to automatically predict whether a sentence should be highlighted or not. Our approach is data-driven and (almost) language-independent, i.e., it does not rely on advanced language processing techniques. Specifically, we analyze the content of previously highlighted documents ranging over the same topic to study the correlations between the occurrence of terms (or sequences of terms) in sentences and the presence/absence of highlights. Such correlations will be exploited to predict new highlights.

Our approach is applicable to homogenous documents (i.e., documents ranging over the same topic), because it relies on frequency-based text analyses. For the sake of simplicity, hereafter we will assume that a sentence is highlighted if at least a portion of its textual content is highlighted. The extension of the proposed approach to documents highlighted at different granularity levels (e.g. at the levels of single words or of paragraphs) is straightforward and its results are discussed in Section 6.

To build the classifier we tested multiple strategies, among which Bayesian classifiers [6], decision trees [7], Support Vector Machines [8], rule-based [9], Neural Networks [9], and associative classifiers [10]. To characterize the sentences of the learning documents, the classifier considers the following features: (i) the occurrences of single terms (unigrams), (ii) the occurrence of sequences of terms (ngrams), and (iii) the level of knowledge of the user who highlighted the sentence (if available). We tested our approach on benchmark documents highlighted by domain experts, i.e., the Document Understanding Conference 2005 SCU-marked documents [11]. Specifically, we compared the performance of various classifiers in generating highlights. The classifiers achieved good accuracy values in predicting highlights.

Nearest Keyword Set Search In Multidimensional Datasets

Objective 2 - Highlight generation driven by the knowledge level of the highlighting users. The reliability and usability of text highlights strongly depend on the level of expertise of the highlighting users [12]. For example, thanks to their proficiency on the covered topic, expert users can produce more reliable highlights than beginners. However, in some cases, the highlights made by users with lower levels of knowledge can be useful for supporting learning activities as well. For example, they may cover background knowledge commonly disregarded by advanced readers.

Learning platforms often allow users to specify their current knowledge level on specific topics. In some cases, this information is not explicitly available, but it can be either inferred from the user role (e.g. academic professor, student of a B.Sc. University-level course) or assessed using ad hoc evaluation strategies (e.g. [13]).

Our aim is to exploit the information about the level of knowledge of the highlighting users during highlight generation and exploration. Since users with the same knowledge level are most likely to highlight the same parts of the text [12], we learn one classification model per level. Each model captures the underlying correlations hidden in the text highlighted by users with the same level. Hence, per-level models generate highlights tailored to different levels of knowledge. To improve the quality of the learning experience, learners may perform a per-level exploration of the newly generated highlights by adapting the level of exploration to their needs. The applicability of the proposed approach was validated on real teaching materials provided to the students of a B.Sc. university-level course.

2. SYSTEM ANALYSIS

2.1. EXISTING SYSTEM

- Location-specific keyword queries on the web and in the GIS systems were earlier answered using a combination of R-Tree and inverted index.
- Felipe et al. developed IR2-Tree to rank objects from spatial datasets based on a combination of their distances to the query locations and the relevance of their text descriptions to the query keywords.
- Cong et al. integrated R-tree and inverted file to answer a query similar to Felipe et al. using a different ranking function.

2.1.1 DISADVANTAGES OF EXISTING SYSTEM

- These techniques do not provide concrete guidelines on how to enable efficient processing for the type of queries where query coordinates are missing.
- In multi-dimensional spaces, it is difficult for users to provide meaningful coordinates, and our work deals with another type of queries where users can only provide keywords as input.
- Without query coordinates, it is difficult to adapt existing techniques to our problem.
- Note that a simple reduction that treats the coordinates of each data point as possible query coordinates suffers poor scalability.

2.2 PROPOSED SYSTEM

- In this project we consider multi-dimensional datasets where each data point has a set of keywords. The presence of keywords in feature space allows for the development of new tools to query and explore these multi-dimensional datasets.
- In this project, we study nearest keyword set (referred to as NKS) queries on text-rich multi-dimensional datasets. An NKS query is a set of user-provided keywords, and the result of the query may include k sets of data points each of which contains all the query keywords and forms one of the top-k tightest cluster in the multi-dimensional space.
- In this project, we propose ProMiSH (short for Projection and Multi-Scale Hashing) to enable fast processing for NKS queries. In particular, we develop an exact ProMiSH (referred to as ProMiSH-E) that always retrieves the optimal top-k results,

Nearest Keyword Set Search In Multidimensional Datasets

and an approximate ProMiSH (referred to as ProMiSH-A) that is more efficient in terms of time and space, and is able to obtain near-optimal results in practice.

- ProMiSH-E uses a set of hash tables and inverted indexes to perform a localized search.

2.2.1 ADVANTAGES OF PROPOSED SYSTEM

- Better time and space efficiency.
- A novel multi-scale index for exact and approximate NKS query processing.
- It's an efficient search algorithms that work with the multi-scale indexes for fast query processing.
- We conduct extensive experimental studies to demonstrate the performance of the proposed techniques.

2.3. HARDWARE REQUIREMENTS

- System : Pentium Dual Core.
- Hard Disk : 120 GB.
- Monitor : 15'' LED
- Input Devices : Keyboard, Mouse
- Ram : 1GB.

2.4. SOFTWARE REQUIREMENTS

- Operating system : Windows 7/8/10
- Technology : JAVA/J2EE
- Web Technologies : HTML, CSS, JavaScript, Servlets, JSPs
- Web Server : Apache TOMCAT 7.0.61
- Tool (IDE) : NetBeans 8.1
- Database : MYSQL

2.5. FEASIBILITY STUDY

An important outcome of preliminary investigation is the determination that the system request is feasible. This is possible only if it is feasible within limited resource and time. The different feasibilities that have to be analysed are:

- **Operational Feasibility**
- **Economic Feasibility**
- **Technical Feasibility**

Operational Feasibility

Operational Feasibility deals with the study of prospects of the system to be developed. This system operationally eliminates all the tensions of the Admin and helps him in effectively tracking the project progress. This kind of automation will surely reduce the time and energy, which previously consumed in manual work. Based on the study, the system is proved to be operationally feasible.

Economic Feasibility

Economic Feasibility or Cost-benefit is an assessment of the economic justification for a computer based project. As hardware was installed from the beginning & for lots of purposes thus the cost on project of hardware is low. Since the system is a network based, any number of employees connected to the LAN within that organization can use this tool from at any time. The Virtual Private Network is to be developed using the existing resources of the organization. So the project is economically feasible.

Technical Feasibility

According to Roger S. Pressman, Technical Feasibility is the assessment of the technical resources of the organization. The organization needs IBM compatible machines with a graphical web browser connected to the Internet and Intranet. The system is developed for platform Independent environment. Java Server Pages, JavaScript, HTML, SQL server and WebLogic Server are used to develop the system. The technical feasibility has been carried out. The system is technically feasible for development and can be developed with the existing facility.

2.6. MODULES DESCRIPTION

2.6.1. ADMIN MODULE

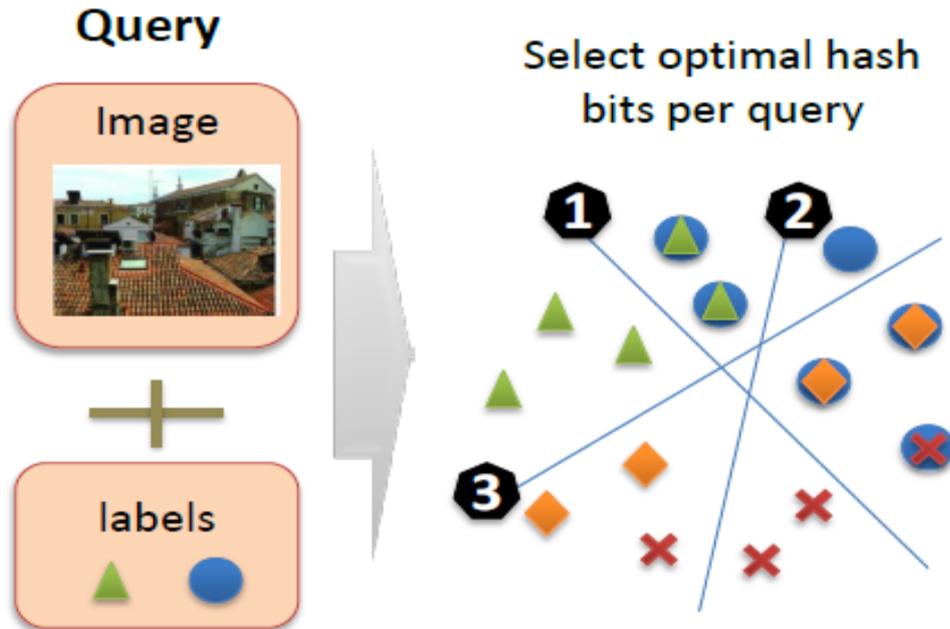
- Upload Documents
- View All Documents
- User's Search Transaction
- All Users
- View Results

2.6.2. END USER MODULE

- View Profile
- Search by Date
- Search by Contents
- Search by Description
- Search by Topic

3. SYSTEM DESIGN

3.1. SYSTEM ARCHITECTURE



3.2. INPUT / OUTPUT DESIGN

3.2.1. INPUT DESIGN

Input Design plays a vital role in the life cycle of software development, it requires very careful attention of developers. The input design is to feed data to the application as accurate as possible. So inputs are supposed to be designed effectively so that the errors occurring while feeding are minimized. According to Software Engineering Concepts, the input forms or screens are designed to provide to have a validation control over the input limit, range and other related validations.

This system has input screens in almost all the modules. Error messages are developed to alert the user whenever he commits some mistakes and guides him in the right way so that invalid entries are not made. Let us see deeply about this under module design.

Input design is the process of converting the user created input into a computer-based format. The goal of the input design is to make the data entry logical and free

Nearest Keyword Set Search In Multidimensional Datasets

from errors. The error in the input are controlled by the input design. The application has been developed in user-friendly manner. The forms have been designed in such a way during the processing the cursor is placed in the position where must be entered. The user is also provided with in an option to select an appropriate input from various alternatives related to the field in certain cases.

Validations are required for each data entered. Whenever a user enters an erroneous data, error message is displayed and the user can move on to the subsequent pages after completing all the entries in the current page.

3.2.2. OUTPUT DESIGN

The Output from the computer is required to mainly create an efficient method of communication within the company primarily among the project leader and his team members, in other words, the administrator and the clients. The output of VPN is the system which allows the project leader to manage his clients in terms of creating new clients and assigning new projects to them, maintaining a record of the project validity and providing folder level access to each client on the user side depending on the projects allotted to him. After completion of a project, a new project may be assigned to the client. User authentication procedures are maintained at the initial stages itself. A new user may be created by the administrator himself or a user can himself register as a new user but the task of assigning projects and validating a new user rests with the administrator only.

The application starts running when it is executed for the first time. The server has to be started and then the internet explorer is used as the browser. The project will run on the local area network so the server machine will serve as the administrator while the other connected systems can act as the clients. The developed system is highly user friendly and can be easily understood by anyone using it even for the first time.

3.3. UML DIAGRAMS

The Unified Modelling Language allows the software engineer to express an analysis model using the modelling notation that is governed by a set of syntactic and pragmatic rules.

3.3.1. CLASS DIAGRAM

The class diagram is the main building block of object oriented modelling. It is used both for general conceptual modelling of the systematic of the application, and for detailed modelling translating the models into programming code. A class with three sections, in the diagram, classes is represented with boxes which contain three parts:

- The upper part holds the name of the class
- The middle part contains the attributes of class
- The bottom part gives the methods or operations the class can take.

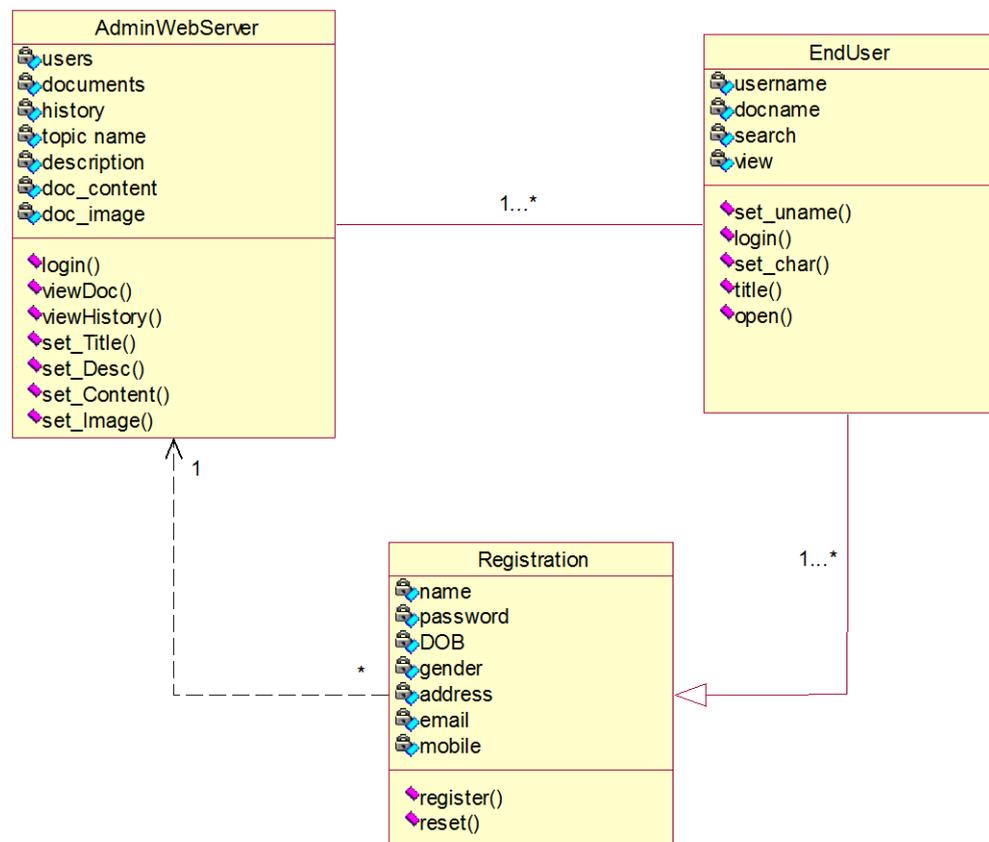


Fig: Class Diagram

3.3.2. USE CASE DIAGRAM

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of the use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system.

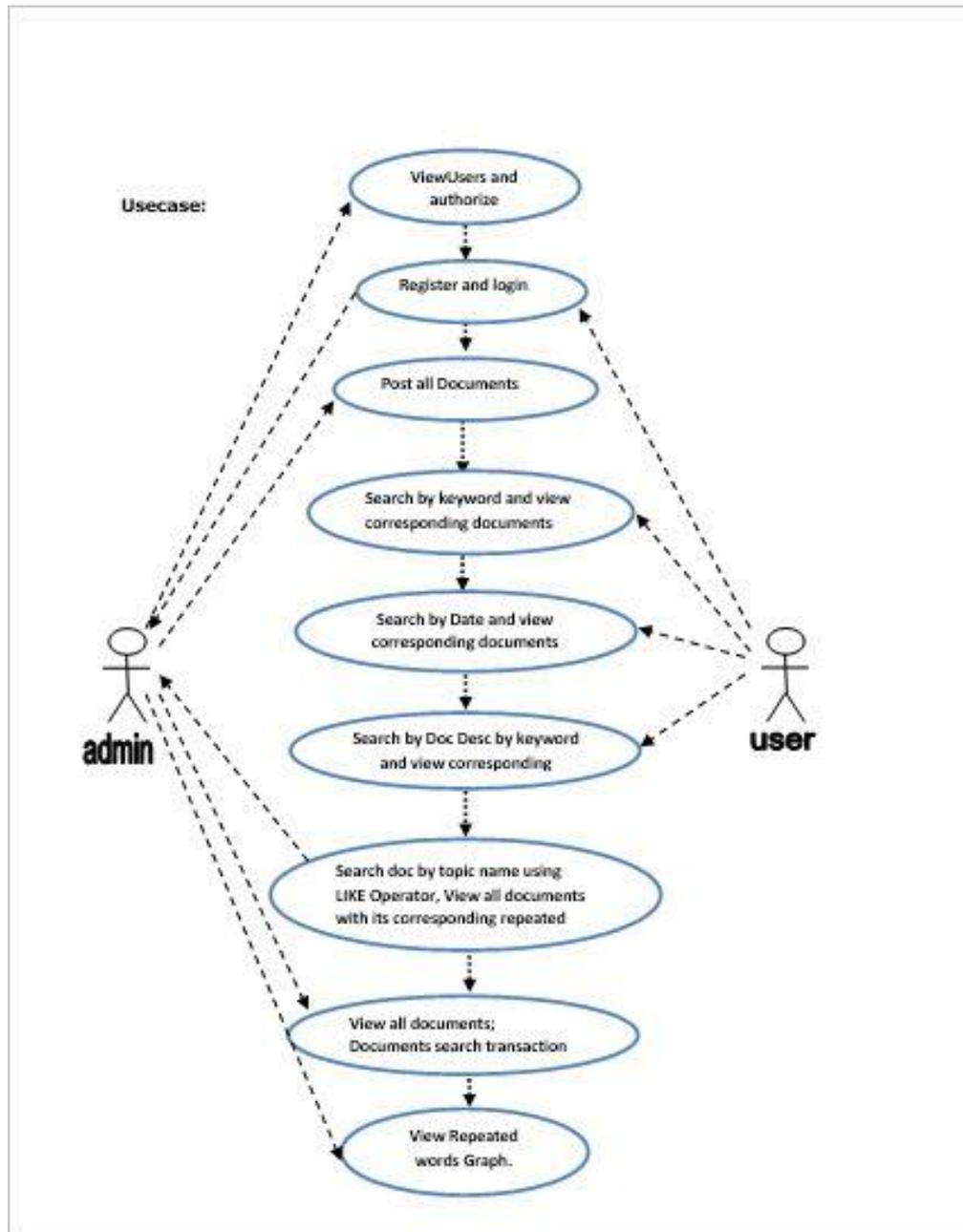


Fig: Use Case Diagram

3.3.3. SEQUENCE DIAGRAM

A sequence diagram is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a message sequence chart. Sequence diagrams are typically associated with use case realizations in the logical view of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios and timing diagrams.

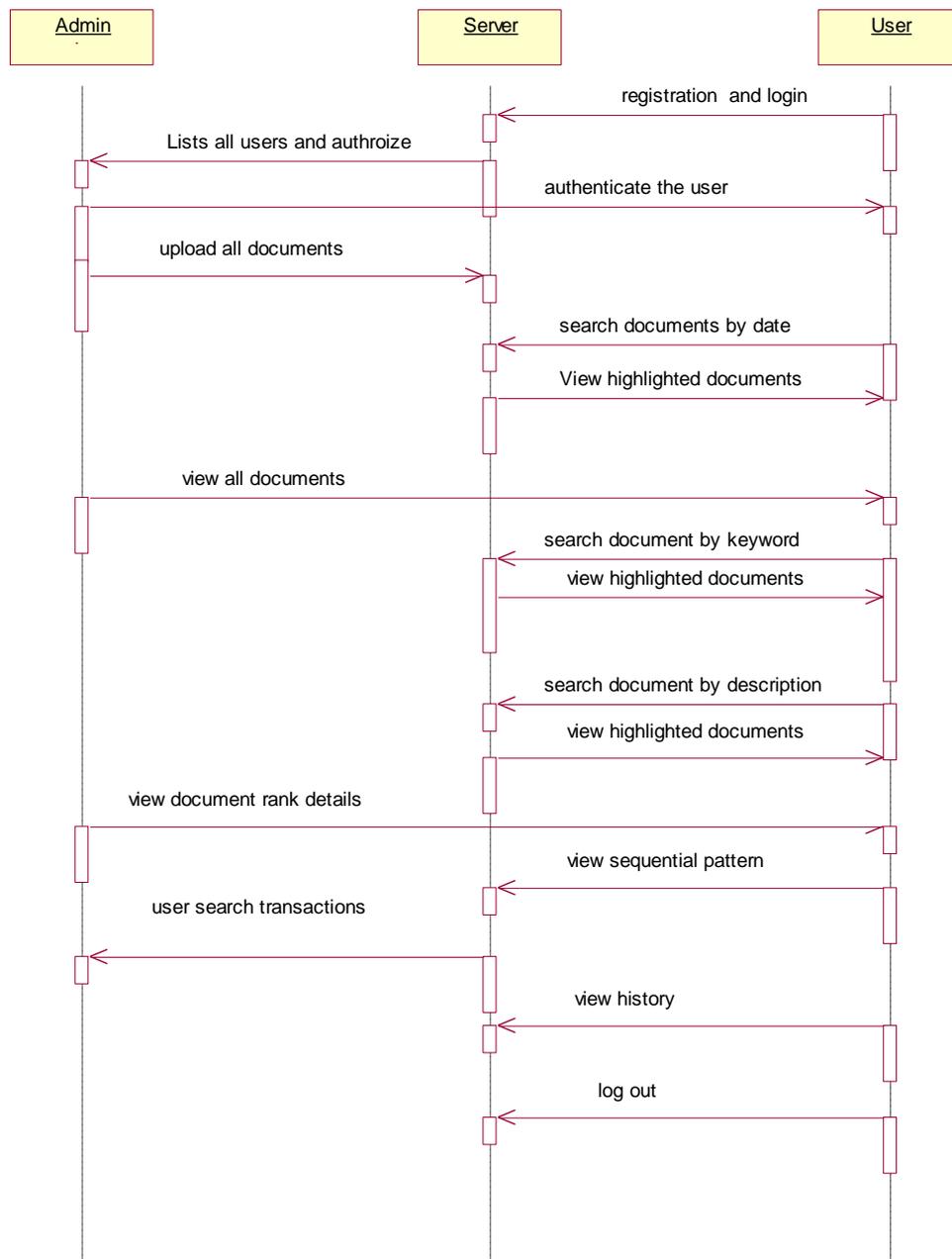


Fig: Sequence Diagram

3.3.4. DATA FLOW DIAGRAM

A data flow diagram is a way of representation a flow of data of a process or a system. The DFD also provides information about the outputs and inputs of each entity and the process itself. A DFD has no control flow, there are decision rules and no loops.

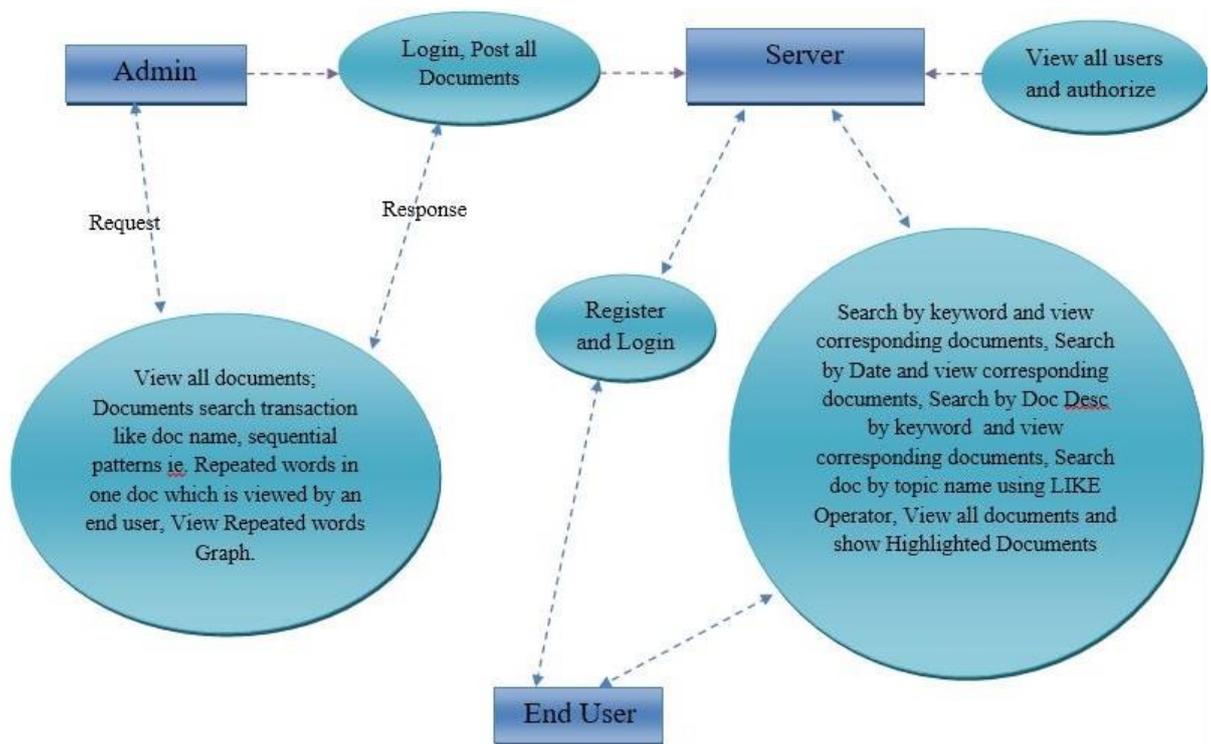


Fig: Data Flow Diagram

3.3.5. FLOW CHART

A flowchart diagram illustrates how data is processed by a system in terms of inputs and outputs.

In nearest keyword set search in multidimensional database, the flow chart diagram is drawn for user and admin

- **Flow chart diagram for user module:**

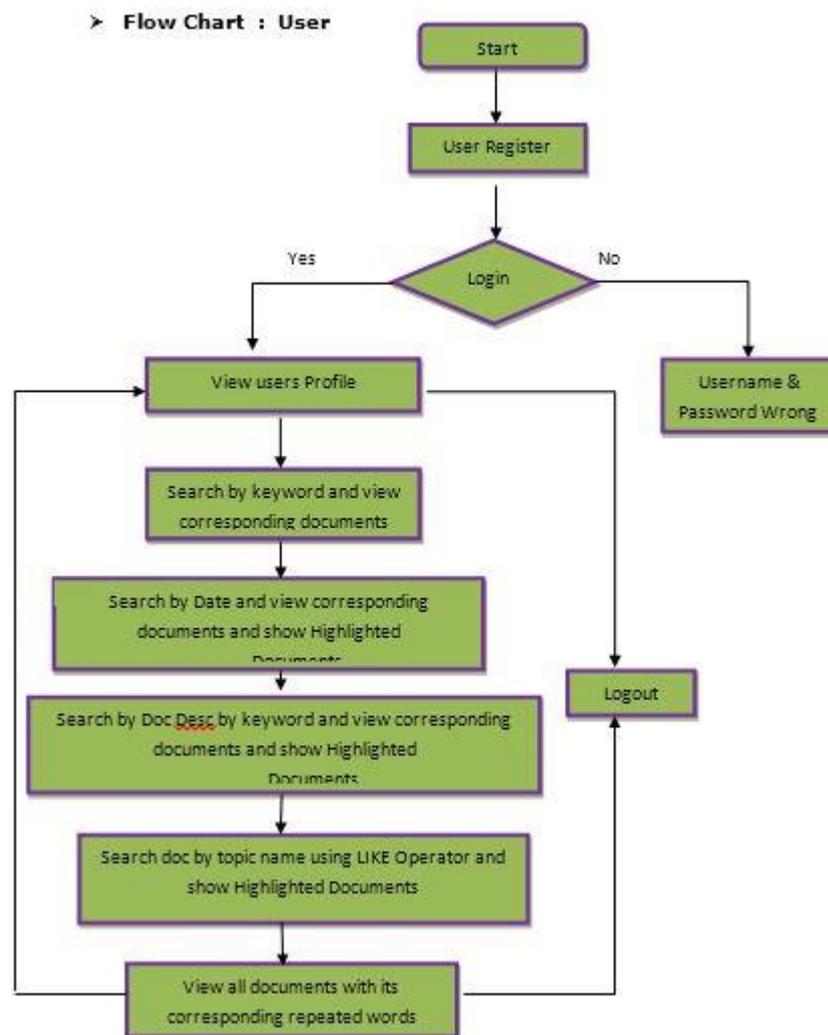


Fig: Flowchart Diagram for User

- Flow chart diagram for admin module:

➤ Flow Chart : Admin

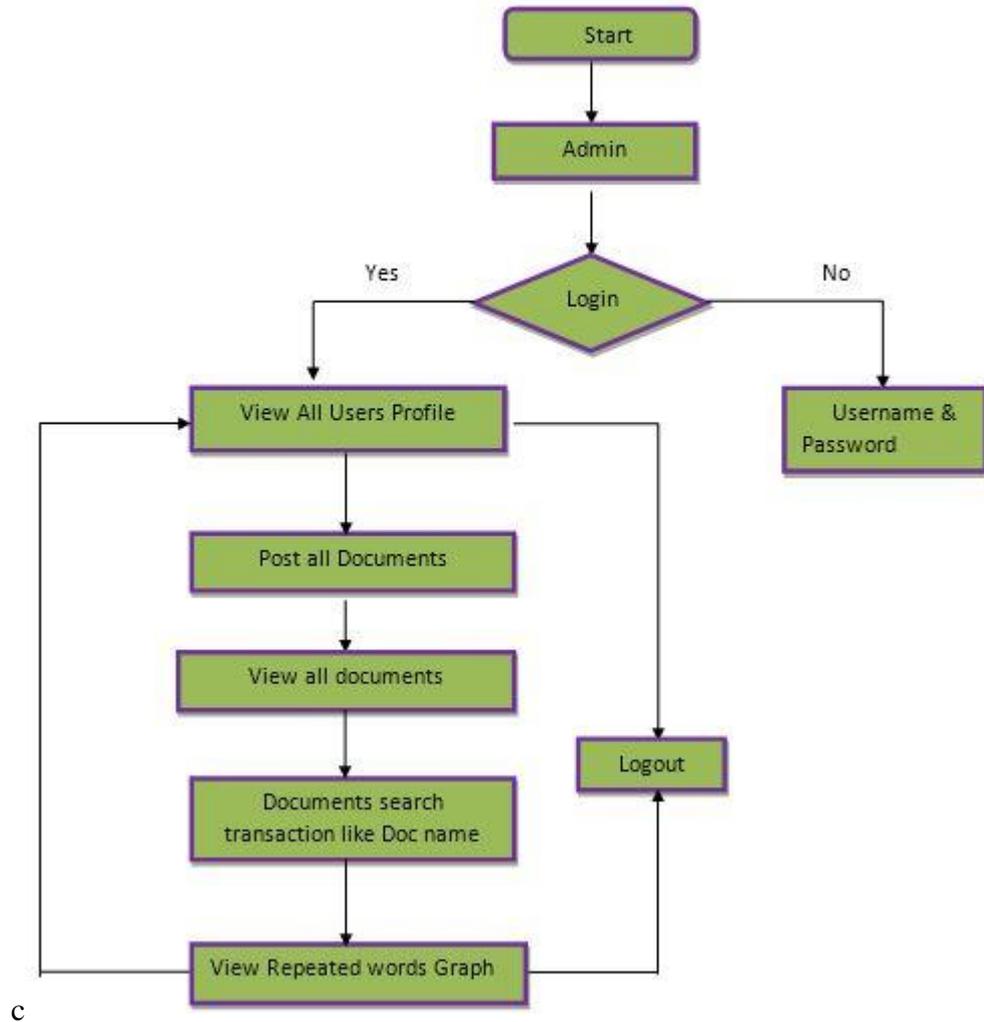


Fig: Flowchart Diagram for Admin

4. IMPLEMENTATION

4.1. MODULE IMPLEMENTATION

4.1.1. DATA REPRESENTATION

For each sentence of the training and test document collections we consider the following attributes: (i) the textual content, (ii) the presence of highlights, and (iii) the level of knowledge of the user who highlighted the sentence (if any). The training data consists of a set of records.

4.1.2. TEXT PREPARATION

To predict highlights from learning documents, the HIGHLIGHTER system considers the following features: (i) the occurrences of single terms (unigrams) in the sentence text, (ii) the occurrence of sequences of terms (n-grams), and (iii) the level of knowledge of the user who highlighted the sentence (if available). To properly handle textual features during sentence classification, few basic preparation steps are applied. First, non-textual content occurring in the text is automatically filtered out before running the learning process. Then, two established text processing steps are applied: (i) stemming and (ii) stop word elimination.

4.1.3. FEATURE SELECTION

To predict the class value of the test records, features in the training dataset may have different importance. Some of them are strongly correlated with the class and, thus, their presence is crucial to perform accurate predictions. Others are uncorrelated with the class. Hence, their presence could be harmful, in terms of both accuracy and efficiency of the classification process.

4.1.4. TEXT CLASSIFICATION

Classification is a two-step process which entails: (i) Learning a model from the training dataset, called classifier, which considers the most significant correlations between the class and the other data features, and (ii) assigning a class value to each record in the test dataset, based on the previously generated model. To investigate the use of text classification algorithms in highlight prediction, we learn multiple benchmark classifiers relying on different techniques.

4.1.5. PER-LEVEL DOCUMENT HIGHLIGHTING

If in the training dataset there is no information about the level of knowledge of the users, one single classification model is generated and used to predict new highlights. Otherwise, the knowledge level of the highlighting users is considered because it is deemed as relevant to perform accurate highlight predictions.

4.2. ADMIN MODULE

There are certain operations that an admin can perform in this web application. They are:

4.2.1. UPLOAD DOCUMENTS

The admin can upload the documents in the database by giving the topic name, description, the date of uploading the document, choosing the document file from the system's location and giving a name to the document then the admin is followed by submitting the document in the database.

4.2.2. VIEW ALL DOCUMENTS

This is the second module where the admin can view the list of all the documents uploaded by him

4.2.3. USER'S SEARCH TRANSACTION

In this module, the admin can view the list of all the user's search transaction individually.

4.2.4. ALL USERS

In this module, the admin can view the list of all the registered users and authenticate them, which enables the user to login to their portal.

4.2.5. VIEW RESULTS

In this module, the admin can view the most retrieved documents in the ranking order wise in the graph format.

4.3. END USER MODULE

This module is only for an end user, where he needs to be registered first and then he will be authenticated to enable the login operation of the user. When a user successfully logs into his account, he will be directed to his home page.

4.3.1. VIEW MY PROFILE

The user can view the details of his profile like, his name, email, phone number, address, his referred documents etc.

4.3.2. SEARCH BY DATE

The user can search a document by date on which a particular document is used, which helps a user to search a precise document which was uploaded on a particular date.

4.3.3. SEARCH BY CONTENT

The user can search a document by giving a content related to the document as input.

4.3.4. SEARCH BY DESCRIPTION

The user can search a document by giving its description as input.

4.3.5. SEARCH BY TOPIC

The user can search a document by giving its topic name as input in the search bar.

4.3.6. VIEW SEQUENTIAL PATTERNS (REPEATED WORDS)

The user can search his document by giving the most repeated words in the document as input. Where he gets a list of related documents as output.

5. TECHNOLOGY

5.1. JAVA

Initially the language was called as “oak” but it was renamed as “Java” in 1995. The primary motivation of this language was the need for a platform-independent (i.e., architecture neutral) language that could be used to create software to be embedded in various consumer electronic devices.

- Java is a programmer’s language.
- Java is cohesive and consistent.
- Except for those constraints imposed by the Internet environment, Java gives the programmer, full control.

Finally, Java is to Internet programming where C was to system programming.

5.1.1. Importance of Java to the Internet

Java has had a profound effect on the Internet. This is because; Java expands the Universe of objects that can move about freely in Cyberspace. In a network, two categories of objects are transmitted between the Server and the Personal computer. They are: Passive information and Dynamic active programs. The Dynamic, Self-executing programs cause serious problems in the areas of Security and probability. But, Java addresses those concerns and by doing so, has opened the door to an exciting new form of program called the Applet.

5.1.2. Java can be used to create two types of programs

Applications and Applets: An application is a program that runs on our Computer under the operating system of that computer. It is more or less like one creating using C or C++. Java’s ability to create Applets makes it important. An Applet is an application designed to be transmitted over the Internet and executed by a Java – compatible web browser. An applet is actually a tiny Java program, dynamically downloaded across the network, just like an image. But the difference is, it is an intelligent program, not just a media file. It can react to the user input and dynamically change.

5.1.3. Features of Java

Security

Every time you that you download a “normal” program, you are risking a viral infection. Prior to Java, most users did not download executable programs frequently, and those who did scanned them for viruses prior to execution. Most users still worried about the possibility of infecting their systems with a virus. In addition, another type of malicious program exists that must be guarded against. This type of program can gather private information, such as credit card numbers, bank account balances, and passwords. Java answers both these concerns by providing a “firewall” between a network application and your computer.

When you use a Java-compatible Web browser, you can safely download Java applets without fear of virus infection or malicious intent.

Portability

For programs to be dynamically downloaded to all the various types of platforms connected to the Internet, some means of generating portable executable code is needed .As you will see, the same mechanism that helps ensure security also helps create portability. Indeed, Java’s solution to these two problems is both elegant and efficient.

The Byte code

The key that allows the Java to solve the security and portability problems is that the output of Java compiler is Byte code. Byte code is a highly optimized set of instructions designed to be executed by the Java run-time system, which is called the Java Virtual Machine (JVM). That is, in its standard form, the JVM is an interpreter for byte code.

Translating a Java program into byte code helps makes it much easier to run a program in a wide variety of environments. The reason is, once the run-time package exists for a given system, any Java program can run on it.

Although Java was designed for interpretation, there is technically nothing about Java that prevents on-the-fly compilation of byte code into native code. Sun has just completed its Just in Time (JIT) compiler for byte code. When the JIT compiler is a part of JVM, it compiles byte code into executable code in real time, on a piece-by-

Nearest Keyword Set Search In Multidimensional Datasets

piece, demand basis. It is not possible to compile an entire Java program into executable code all at once, because Java performs various run-time checks that can be done only at run time. The JIT compiles code, as it is needed, during execution.

5.1.4. Java Virtual Machine (JVM)

Beyond the language, there is the Java virtual machine. The Java virtual machine is an important element of the Java technology. The virtual machine can be embedded within a web browser or an operating system. Once a piece of Java code is loaded onto a machine, it is verified. As part of the loading process, a class loader is invoked and does byte code verification makes sure that the code that's has been generated by the compiler will not corrupt the machine that it's loaded on. Byte code verification takes place at the end of the compilation process to make sure that is all accurate and correct. So byte code verification is integral to the compiling and executing of Java code.

Overall Description

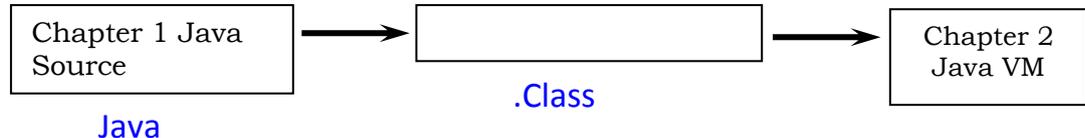


Fig: Development Process of JAVA Program

Java programming uses to produce byte codes and executes them. The first box indicates that the Java source code is located in a .Java file that is processed with a Java compiler called javac. The Java compiler produces a file called a .class file, which contains the byte code. The .Class file is then loaded across the network or loaded locally on your machine into the execution environment is the Java virtual machine, which interprets and executes the byte code.

5.1.5. Java Architecture

Java architecture provides a portable, robust, high performing environment for development. Java provides portability by compiling the byte codes for the Java Virtual Machine, which is then interpreted on each platform by the run-time

environment. Java is a dynamic system, able to load code when needed from a machine in the same room or across the planet.

5.1.6. Compilation of code

When you compile the code, the Java compiler creates machine code (called byte code) for a hypothetical machine called Java Virtual Machine (JVM). The JVM is supposed to execute the byte code. The JVM is created for overcoming the issue of portability. The code is written and compiled for one machine and interpreted on all machines. This machine is called Java Virtual Machine.

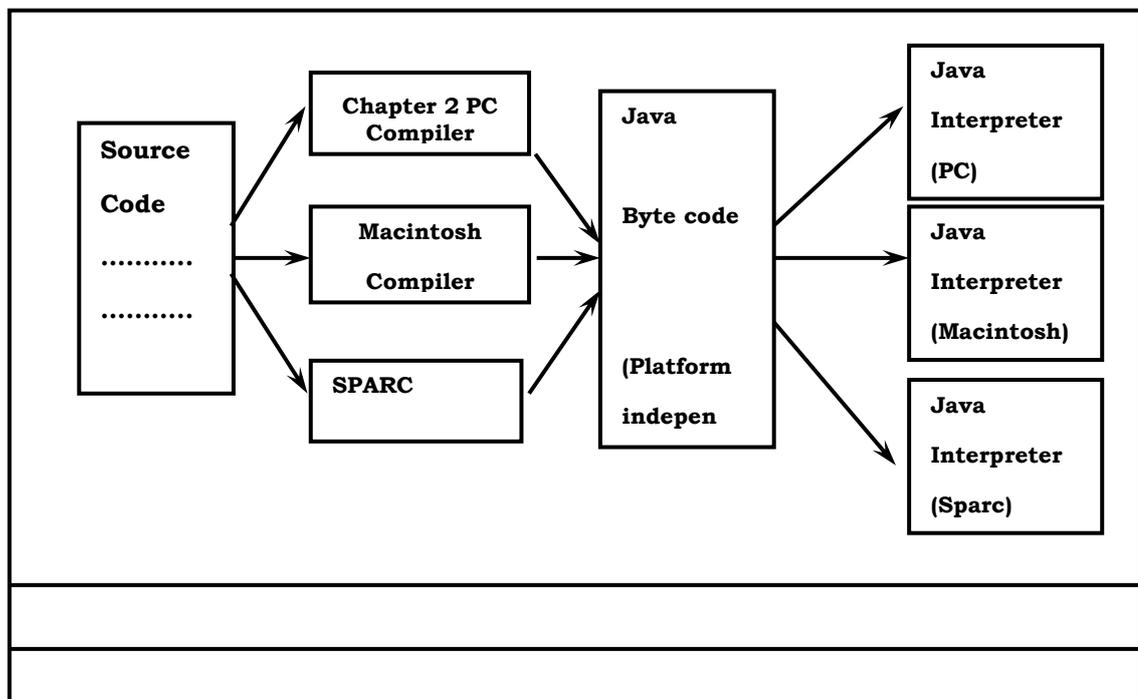


Fig: Compiling and interpreting Java Source Code

During run-time the Java interpreter tricks the byte code file into thinking that it is running on a Java Virtual Machine. In reality this could be a Intel Pentium Windows 95 or Sun SARC station running Solaris or Apple Macintosh running system and all could receive code from any computer through Internet and run the Applets.

Simple

Java was designed to be easy for the Professional programmer to learn and to use effectively. If you are an experienced C++ programmer, learning Java will be even easier. Because Java inherits the C/C++ syntax and many of the object oriented features of C++. Most of the confusing concepts from C++ are either left out of Java or implemented in a cleaner, more approachable manner. In Java there are a small number of clearly defined ways to accomplish a given task.

Object-Oriented

Java was not designed to be source-code compatible with any other language. This allowed the Java team the freedom to design with a blank slate. One outcome of this was a clean usable, pragmatic approach to objects. The object model in Java is simple and easy to extend, while simple types, such as integers, are kept as high-performance non-objects.

Robust

The multi-platform environment of the Web places extraordinary demands on a program, because the program must execute reliably in a variety of systems. The ability to create robust programs was given a high priority in the design of Java. Java is strictly typed language; it checks your code at compile time and run time.

Java virtually eliminates the problems of memory management and deallocation, which is completely automatic. In a well-written Java program, all run time errors can and should be managed by your program.

5.2. JAVASCRIPT

JavaScript is a script-based programming language that was developed by Netscape Communication Corporation. JavaScript was originally called Live Script and renamed as JavaScript to indicate its relationship with Java. JavaScript supports the development of both client and server components of Web-based applications. On the client side, it can be used to write programs that are executed by a Web browser within the context of a Web page. On the server side, it can be used to write Web server programs that can process information submitted by a Web browser and then updates the browser's

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display accordingly. Even though JavaScript supports both client and server Web programming, we prefer JavaScript at Client side programming since most of the browsers supports it. JavaScript is almost as easy to learn as HTML, and JavaScript statements can be included in HTML documents by enclosing the statements between a pair of scripting tags

```
<SCRIPTS>..  
</SCRIPT>.
```

```
<SCRIPT LANGUAGE = "JavaScript">
```

```
JavaScript statements
```

```
</SCRIPT>
```

Here are a few things we can do with JavaScript:

- Validate the contents of a form and make calculations.
- Add scrolling or changing messages to the Browser's status line.
- Animate images or rotate images that change when we move the mouse over them.
- Detect the browser in use and display different content for different browsers.
- Detect installed plug-ins and notify the user if a plug-in is required.

We can do much more with JavaScript, including creating entire application.

5.2.1. JavaScript vs Java

JavaScript and Java are entirely different languages. A few of the most glaring differences are:

- Java applets are generally displayed in a box within the web document; JavaScript can affect any part of the Web document itself.
- While JavaScript is best suited to simple applications and adding interactive features to Web pages; Java can be used for incredibly complex applications.

There are many other differences but the important thing to remember is that JavaScript and Java are separate languages. They are both useful for different things; in fact they can be used together to combine their advantages.

5.2.2. ADVANTAGES

- JavaScript can be used for Sever-side and Client-side scripting.
- It is more flexible than VBScript.
- JavaScript is the default scripting languages at Client-side since all the browsers supports it.

5.3. HYPER TEXT MARK-UP LANGUAGE

Hypertext Mark-up Language (HTML), the languages of the World Wide Web (WWW), allows users to produces Web pages that include text, graphics and pointer to other Web pages (Hyperlinks).

HTML is not a programming language but it is an application of ISO Standard 8879, SGML (Standard Generalized Mark-up Language), but specialized to hypertext and adapted to the Web. The idea behind Hypertext is that instead of reading text in rigid linear structure, we can easily jump from one point to another point. We can navigate through the information based on our interest and preference. A markup language is simply a series of elements, each delimited with special characters that define how text or other items enclosed within the elements should be displayed. Hyperlinks are underlined or emphasized works that load to other documents or some portions of the same document.

HTML can be used to display any type of document on the host computer, which can be geographically at a different location. It is a versatile language and can be used on any platform or desktop.

HTML provides tags (special codes) to make the document look attractive. HTML tags are not case-sensitive. Using graphics, fonts, different sizes, colour, etc., can enhance the presentation of the document. Anything that is not a tag is part of the document itself.

Basic HTML Tags:

<code><!-- --></code>	specifies comments
<code><A>.....</code>	Creates hypertext links
<code>.....</code>	Formats text as bold

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<BIG>.....</BIG>	Formats text in large font.
<BODY>...</BODY>	Contains all tags and text in the HTML document
<CENTER>...</CENTER>	Creates text
<DD>...</DD>	Definition of a term
<DL>...</DL>	Creates definition list
...	Formats text with a particular font
<FORM>...</FORM>	Encloses a fill-out form
<FRAME>...</FRAME>	Defines a particular frame in a set of frames
<H#>...</H#>	Creates headings of different levels
<HEAD>...</HEAD>	Contains tags that specify information about a document
<HR>...</HR>	Creates a horizontal rule
<HTML>...</HTML>	Contains all other HTML tags
<META>...</META>	Provides meta-information about a document
<SCRIPT>...</SCRIPT>	Contains client-side or server-side script
<TABLE>...</TABLE>	Creates a table
<TD>...</TD>	Indicates table data in a table
<TR>...</TR>	Designates a table row
<TH>...</TH>	Creates a heading in a table

5.3.1. ADVANTAGES

- A HTML document is small and hence easy to send over the net. It is small because it does not include formatted information.
- HTML is platform independent.
- HTML tags are not case-sensitive.

5.4. CASCADING STYLE SHEETS

Cascading Style Sheets, fondly referred to as CSS, is a simple design language intended to simplify the process of making web pages presentable.

CSS handles the look and feel part of a web page. Using CSS, you can control the colour of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, what background images or colors are used, layout designs, and variations in display for different devices and screen sizes as well as a variety of other effects.

CSS is easy to learn and understand but it provides powerful control over the presentation of an HTML document. Most commonly, CSS is combined with the mark-up languages HTML or XHTML.

5.4.1. ADVANTAGES OF CSS

- **CSS saves time** – you can write CSS once and then reuse same sheet in multiple HTML pages. You can define a style for each HTML element and apply it to as many Web pages as you want.
- **Pages load faster** – If you are using CSS, you do not need to write HTML tag attributes every time. Just write one CSS rule of a tag and apply it to all the occurrences of that tag. So less code means faster download times.
- **Easy maintenance** – To make a global change, simply change the style, and all elements in all the web pages will be updated automatically.
- **Superior styles to HTML** – CSS has a much wider array of attributes than HTML, so you can give a far better look to your HTML page in comparison to HTML attributes.
- **Multiple Device Compatibility** – Style sheets allow content to be optimized for more than one type of device. By using the same HTML document, different versions of a website can be presented for handheld devices such as PDAs and cell phones or for printing.
- **Global web standards** – Now HTML attributes are being deprecated and it is being recommended to use CSS. So its a good idea to start using CSS in all the HTML pages to make them compatible to future browsers.

5.4.2. WHO CREATES AND MAINTAINS CSS?

CSS is created and maintained through a group of people within the W3C called the CSS Working Group. The CSS Working Group creates documents called

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specifications. When a specification has been discussed and officially ratified by the W3C members, it becomes a recommendation.

These ratified specifications are called recommendations because the W3C has no control over the actual implementation of the language. Independent companies and organizations create that software.

5.4.3. CSS VERSIONS

Cascading Style Sheets level 1 (CSS1) came out of W3C as a recommendation in December 1996. This version describes the CSS language as well as a simple visual formatting model for all the HTML tags.

CSS2 became a W3C recommendation in May 1998 and builds on CSS1. This version adds support for media-specific style sheets e.g. printers and aural devices, downloadable fonts, element positioning and tables.

A CSS comprises of style rules that are interpreted by the browser and then applied to the corresponding elements in your document. A style rule is made of three parts –

- **Selector** – A selector is an HTML tag at which a style will be applied. This could be any tag like `<h1>` or `<table>` etc.
- **Property** – A property is a type of attribute of HTML tag. Put simply, all the HTML attributes are converted into CSS properties. They could be *colour*, *border* etc.
- **Value** – Values are assigned to properties. For example, *colour* property can have value either *red* or *#F1F1F1* etc.

5.5. JAVA DATABASE CONNECTIVITY

What Is JDBC?

JDBC is a Java API for executing SQL statements. (As a point of interest, JDBC is a trademarked name and is not an acronym; nevertheless, JDBC is often thought of as standing for Java Database Connectivity. It consists of a set of classes and interfaces written in the Java programming language. JDBC provides a standard API for tool/database developers and makes it possible to write database applications using a pure Java API.

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Using JDBC, it is easy to send SQL statements to virtually any relational database. One can write a single program using the JDBC API, and the program will be able to send SQL statements to the appropriate database. The combinations of Java and JDBC lets a programmer write it once and run it anywhere.

What Does JDBC Do?

Simply put, JDBC makes it possible to do three things:

- Establish a connection with a database
- Send SQL statements
- Process the results.

5.5.1. JDBC versus ODBC and other APIs

At this point, Microsoft's ODBC (Open Database Connectivity) API is that probably the most widely used programming interface for accessing relational databases. It offers the ability to connect to almost all databases on almost all platforms.

So why not just use ODBC from Java? The answer is that you can use ODBC from Java, but this is best done with the help of JDBC in the form of the JDBC-ODBC Bridge, which we will cover shortly. The question now becomes "Why do you need JDBC?" There are several answers to this question:

1. ODBC is not appropriate for direct use from Java because it uses a C interface. Calls from Java to native C code have a number of drawbacks in the security, implementation, robustness, and automatic portability of applications.
2. A literal translation of the ODBC C API into a Java API would not be desirable. For example, Java has no pointers, and ODBC makes copious use of them, including the notoriously error-prone generic pointer "void *". You can think of JDBC as ODBC translated into an object-oriented interface that is natural for Java programmers.
3. ODBC is hard to learn. It mixes simple and advanced features together, and it has complex options even for simple queries. JDBC, on the other hand, was designed to keep simple things simple while allowing more advanced capabilities where required.

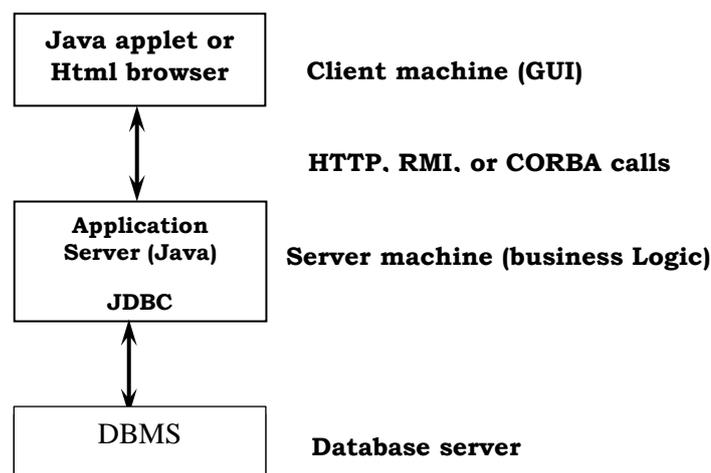
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4. A Java API like JDBC is needed in order to enable a "pure Java" solution. When ODBC is used, the ODBC driver manager and drivers must be manually installed on every client machine. When the JDBC driver is written completely in Java, however, JDBC code is automatically installable, portable, and secure on all Java platforms from network computers to mainframes.

5.6. Two-tier and Three-tier Models

The JDBC API supports both two-tier and three-tier models for database access.

In the two-tier model, a Java applet or application talks directly to the database. This requires a JDBC driver that can communicate with the particular database management system being accessed. A user's SQL statements are delivered to the database, and the results of those statements are sent back to the user. The database may be located on another machine to which the user is connected via a network. This is referred to as a



client/server configuration, with the user's machine as the client, and the machine housing the database as the server. The network can be an Intranet, which, for example, connects employees within a corporation, or it can be the Internet. In the three-tier model, commands are sent to a "middle tier" of services, which then send SQL statements to the database. The database processes the SQL statements and sends the results back to the middle tier, which then sends them to the user. MIS directors find the three-tier model very attractive because the middle tier makes it possible to maintain control over access and the kinds of updates that can be made to corporate data. Another advantage is that when there is a middle tier, the user can employ an easy-to-use higher-level API which is translated by the middle tier into the appropriate low-level calls. Finally, in many cases the

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Three-tier architecture can provide performance advantages.

Until now the middle tier has typically been written in languages such as C or C++, which offer fast performance. However, with the introduction of optimizing compilers that translate Java byte code into efficient machine-specific code, it is becoming practical to implement the middle tier in Java. This is a big plus, making it possible to take advantage of Java's robustness, multithreading, and security features. JDBC is important to allow database access from a Java middle tier.

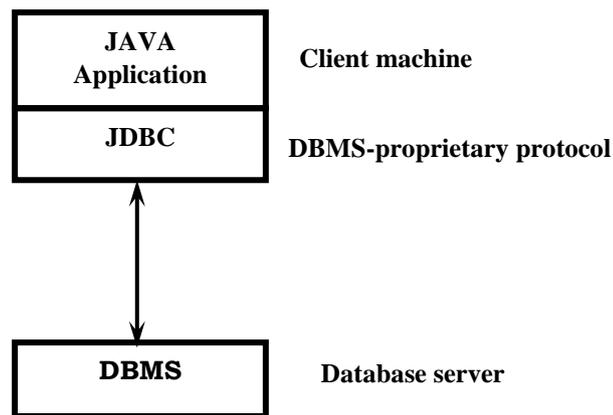


Fig: JDBC two-tier architecture

5.7. JDBC Driver Types

The JDBC drivers that we are aware of at this time fit into one of four categories:

- JDBC-ODBC bridge plus ODBC driver
- Native-API partly-Java driver
- JDBC-Net pure Java driver
- Native-protocol pure Java driver

5.7.1. JDBC-ODBC Bridge

If possible, use a Pure Java JDBC driver instead of the Bridge and an ODBC driver. This completely eliminates the client configuration required by ODBC. It also eliminates the potential that the Java VM could be corrupted by an error in the native code brought in by the Bridge (that is, the Bridge native library, the ODBC driver manager library, the ODBC driver library, and the database client library).

5.7.2. What Is the JDBC- ODBC Bridge?

The JDBC-ODBC Bridge is a JDBC driver, which implements JDBC operations by translating them into ODBC operations. To ODBC it appears as a normal application program. The Bridge implements JDBC for any database for which an ODBC driver is available. The Bridge is implemented as the sun.jdbc.odbc Java package and contains a native library used to access ODBC. The Bridge is a joint development of Intersolv and JavaSoft.

5.8. Java Server Pages (JSP)

Java server Pages is a simple, yet powerful technology for creating and maintaining dynamic-content web pages. Based on the Java programming language, Java Server Pages offers proven portability, open standards, and a mature re-usable component model .The Java Server Pages architecture enables the separation of content generation from content presentation. This separation not eases maintenance headaches, it also allows web team members to focus on their areas of expertise. Now, web page designer can concentrate on layout, and web application designers on programming, with minimal concern about impacting each other's work.

5.8.1. Features of JSP

Portability:

Java Server Pages files can be run on any web server or web-enabled application server that provides support for them. Dubbed the JSP engine, this support involves recognition, translation, and management of the Java Server Page lifecycle and its interaction components.

Components:

It was mentioned earlier that the Java Server Pages architecture can include reusable Java components. The architecture also allows for the embedding of a scripting language directly into the Java Server Pages file. The components current supported include Java Beans, and Servlets.

Processing:

A Java Server Pages file is essentially an HTML document with JSP scripting or tags. The Java Server Pages file has a JSP extension to the server as a Java Server Pages file.

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Before the page is served, the Java Server Pages syntax is parsed and processed into a Servlet on the server side. The Servlet that is generated outputs real content in straight HTML for responding to the client.

Access Models:

A Java Server Pages file may be accessed in at least two different ways. A client's request comes directly into a Java Server Page. In this scenario, suppose the page accesses reusable Java Bean components that perform particular well-defined computations like accessing a database. The result of the Beans computations, called result sets is stored within the Bean as properties. The page uses such Beans to generate dynamic content and present it back to the client.

In both of the above cases, the page could also contain any valid Java code. Java Server Pages architecture encourages separation of content from presentation.

5.8.2. Steps in the execution of a JSP Application:

1. The client sends a request to the web server for a JSP file by giving the name of the JSP file within the form tag of a HTML page.
2. This request is transferred to the Java Webserver. At the server side Java Webserver receives the request and if it is a request for a jsp file server gives this request to the JSP engine.
3. JSP engine is program which can understands the tags of the jsp and then it converts those tags into a Servlet program and it is stored at the server side. This Servlet is loaded in the memory and then it is executed and the result is given back to the JavaWebServer and then it is transferred back to the result is given back to the JavaWebServer and then it is transferred back to the client.

5.9. SERVLETS

5.9.1. WHAT ARE SERVLETS?

Java Servlets are programs that run on a Web or Application server and act as a middle layer between a requests coming from a Web browser or other HTTP client and databases or applications on the HTTP server.

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Using Servlets, you can collect input from users through web page forms, present records from a database or another source, and create web pages dynamically.

Java Servlets often serve the same purpose as programs implemented using the Common Gateway Interface (CGI). But Servlets offer several advantages in comparison with the CGI.

- Performance is significantly better.
- Servlets execute within the address space of a Web server. It is not necessary to create a separate process to handle each client request.
- Servlets are platform-independent because they are written in Java.
- Java security manager on the server enforces a set of restrictions to protect the resources on a server machine. So servlets are trusted.
- The full functionality of the Java class libraries is available to a servlet. It can communicate with applets, databases, or other software via the sockets and RMI mechanisms that you have seen already.

5.9.2. SERVLETS ARCHITECTURE

The following diagram shows the position of Servlets in a Web Application.

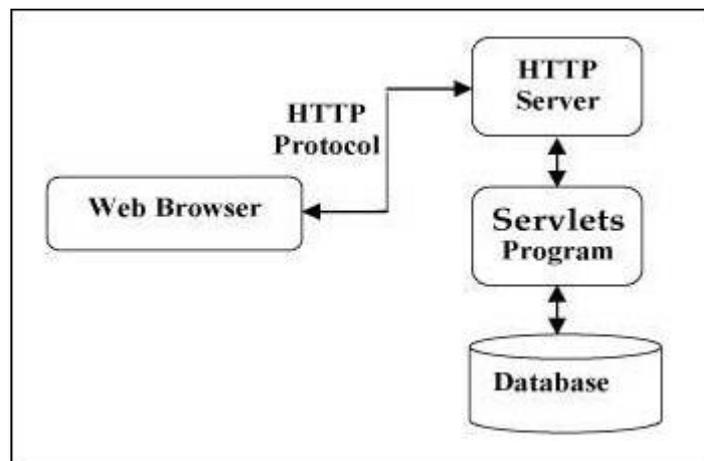


Fig: Position of Servlets in a Web Application

5.9.3. SERVLETS TASKS

Servlets perform the following major tasks –

- Read the explicit data sent by the clients (browsers). This includes an HTML form on a Web page or it could also come from an applet or a custom HTTP client program.

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- Read the implicit HTTP request data sent by the clients (browsers). This includes cookies, media types and compression schemes the browser understands, and so forth.
- Process the data and generate the results. This process may require talking to a database, executing an RMI or CORBA call, invoking a Web service, or computing the response directly.
- Send the explicit data (i.e., the document) to the clients (browsers). This document can be sent in a variety of formats, including text (HTML or XML), binary (GIF images), Excel, etc.
- Send the implicit HTTP response to the clients (browsers). This includes telling the browsers or other clients what type of document is being returned (e.g., HTML), setting cookies and caching parameters, and other such tasks.

5.9.4. SERVLETS PACKAGES

Java Servlets are Java classes run by a web server that has an interpreter that supports the Java Servlet specification.

Servlets can be created using the **javax.servlet** and **javax.servlet.http** packages, which are a standard part of the Java's enterprise edition, an expanded version of the Java class library that supports large-scale development projects.

These classes implement the Java Servlet and JSP specifications. At the time of writing this tutorial, the versions are Java Servlet 2.5 and JSP 2.1.

Java servlets have been created and compiled just like any other Java class. After you install the servlet packages and add them to your computer's Class path, you can compile servlets with the JDK's Java compiler or any other current compiler.

5.9.5. SETTING UP WEB SERVER – TOMCAT

A number of Web Servers that support servlets are available in the market. Some web servers are freely downloadable and Tomcat is one of them.

Apache Tomcat is an open source software implementation of the Java Servlet and Java Server Pages technologies and can act as a standalone server for testing servlets and can be integrated with the Apache Web Server. Here are the steps to setup Tomcat on your machine –

- Download latest version of Tomcat from <https://tomcat.apache.org/>.

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- Once you downloaded the installation, unpack the binary distribution into a convenient location. For example in C:\apache-tomcat-8.0.28 on windows, or /usr/local/apache-tomcat-8.0.289 on Linux/Unix and create CATALINA_HOME environment variable pointing to these locations.

Tomcat can be started by executing the following commands on windows machine –

Tomcat can be started by executing the following commands on UNIX (Solaris, Linux, etc.) machine

```
%CATALINA_HOME%\bin\startup.bat
```

Or

```
C:\apache-tomcat-8.0.28\bin\startup.bat
```

After start up, the default web applications included with Tomcat will be available by visiting <http://localhost:8080/>. If everything is fine then it should display following result –

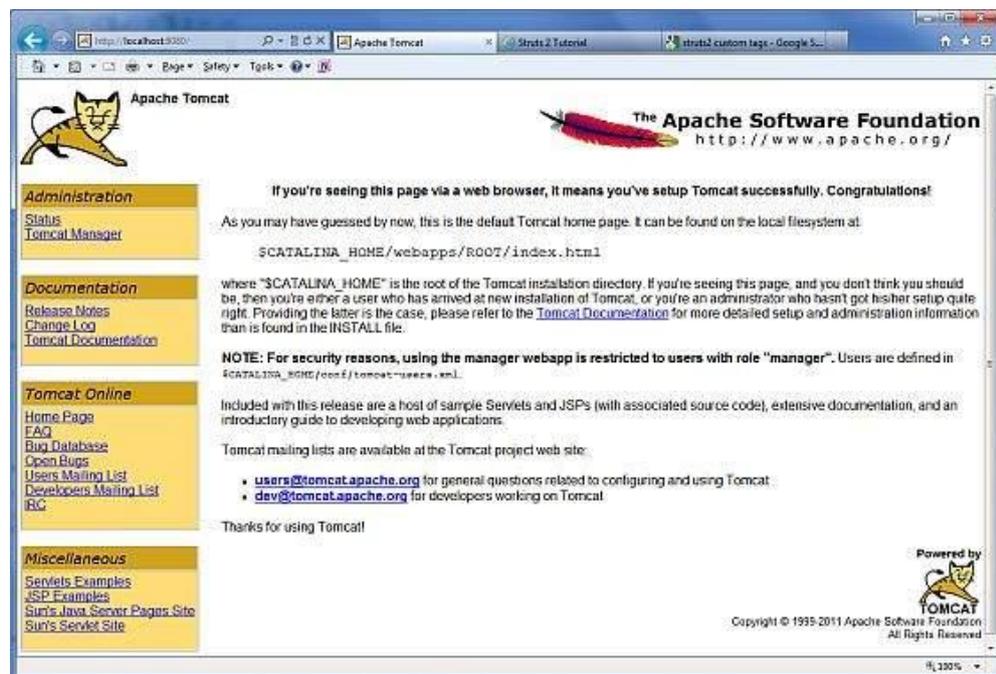


Fig: Tomcat Setup

Further information about configuring and running Tomcat can be found in the documentation included here, as well as on the Tomcat web site – <http://tomcat.apache.org>

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Tomcat can be stopped by executing the following commands on windows machine –

```
C:\apache-tomcat-8.0.28\bin\shutdown
```

Tomcat can be stopped by executing the following commands on UNIX (Solaris, Linux, etc.) machine –

```
/usr/local/apache-tomcat-8.0.28/bin/shutdown.sh
```

5.9.6. SERVLET LIFE CYCLE

A servlet life cycle can be defined as the entire process from its creation till the destruction. The following are the paths followed by a servlet.

- The servlet is initialized by calling the **init()** method.
- The servlet calls **service()** method to process a client's request.
- The servlet is terminated by calling the **destroy()** method.

Finally, servlet is garbage collected by the garbage collector of the JVM.

Now let us discuss the life cycle methods in detail.

5.9.7. THE INIT() METHOD

The init method is called only once. It is called only when the servlet is created, and not called for any user requests afterwards. So, it is used for one-time initializations, just as with the init method of applets.

The servlet is normally created when a user first invokes a URL corresponding to the servlet, but you can also specify that the servlet be loaded when the server is first started.

When a user invokes a servlet, a single instance of each servlet gets created, with each user request resulting in a new thread that is handed off to doGet or doPost as appropriate. The init() method simply creates or loads some data that will be used throughout the life of the servlet.

The init method definition looks like this –

```
public void init() throws ServletException {
```

```
// Initialization code...
```

```
}
```

5.9.8. THE SERVICE() METHOD

The service() method is the main method to perform the actual task. The servlet container (i.e. web server) calls the service() method to handle requests coming from the client (browsers) and to write the formatted response back to the client.

Each time the server receives a request for a servlet, the server spawns a new thread and calls service. The service() method checks the HTTP request type (GET, POST, PUT, DELETE, etc.) and calls doGet, doPost, doPut, doDelete, etc. methods as appropriate.

Here is the signature of this method –

```
public void service(ServletRequest request, ServletResponse response)
```

```
throws ServletException, IOException {
```

```
}
```

The service () method is called by the container and service method invokes doGet, doPost, doPut, doDelete, etc. methods as appropriate. So you have nothing to do with service() method but you override either doGet() or doPost() depending on what type of request you receive from the client.

The doGet() and doPost() are most frequently used methods with in each service request. Here is the signature of these two methods.

5.9.9. THE DOGET() METHOD

A GET request results from a normal request for a URL or from an HTML form that has no METHOD specified and it should be handled by doGet() method.

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```
public void doGet(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
// Servlet code
}
```

5.9.10. THE DOPOST() METHOD

A POST request results from an HTML form that specifically lists POST as the METHOD and it should be handled by doPost() method.

```
public void doPost(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
// Servlet code
}
```

5.9.11. THE DESTROY() METHOD

The destroy() method is called only once at the end of the life cycle of a servlet. This method gives your servlet a chance to close database connections, halt background threads, write cookie lists or hit counts to disk, and perform other such cleanup activities.

After the destroy() method is called, the servlet object is marked for garbage collection. The destroy method definition looks like this –

```
public void destroy() {
// Finalization code...
}
```

5.9.12. ARCHITECTURE DIAGRAM

The following figure depicts a typical servlet life-cycle scenario.

- First the HTTP requests coming to the server are delegated to the servlet container.
- The servlet container loads the servlet before invoking the service() method.
- Then the servlet container handles multiple requests by spawning multiple threads, each thread executing the service() method of a single instance of the servlet.

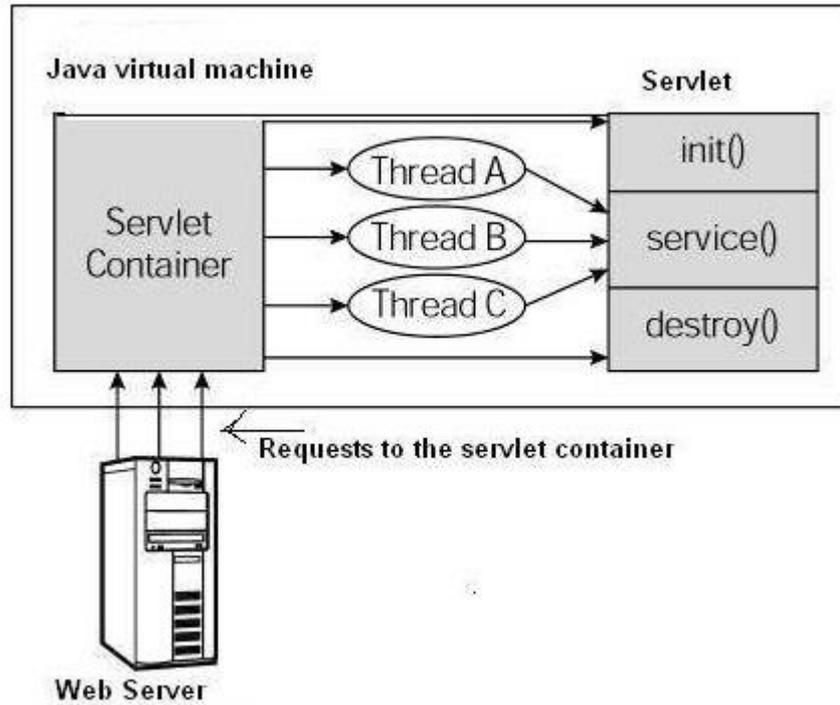


Fig: Servlet Architecture Diagram

6. SAMPLE CODE

CONNECT.JSP

```
<title></title>
<%@ page import="java.sql.*"%>
<%@ page import="java.util.*" %>
<%
    Connection connection = null;
    try {

        Class.forName("com.mysql.jdbc.Driver");

        connection =
DriverManager.getConnection("jdbc:mysql://localhost:3306/mining","root","root");
        String sql="";

    }
    catch(Exception e)
    {
        System.out.println(e);
    }
%>
```

USER AUTHENTICATION PAGE

```
<title>Authentication Page</title>
<%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
<%@page import="java.util.*"%>
<%@ include file="connect.jsp"%>
<%@page
    import="java.util.*,java.security.Key,java.util.Random,javax.crypto.Cipher,jav
ax.crypto.spec.SecretKeySpec,org.bouncycastle.util.encoders.Base64"%>
<%@ page
    import="java.sql.*,java.util.Random,java.io.PrintStream,java.io.FileOutputStr
eam,java.io.FileInputStream,java.security.DigestInputStream,java.math.BigInteger,ja
va.security.MessageDigest,java.io.BufferedInputStream"%>
<%@ page
    import="java.security.Key,java.security.KeyPair,java.security.KeyPairGenerat
or,javax.crypto.Cipher"%>
<%@page
    import="java.util.*,java.text.SimpleDateFormat,java.util.Date,java.io.FileInpu
tStream,java.io.FileOutputStream,java.io.PrintStream"%>

<%
    String name = request.getParameter("userid");
    String pass = request.getParameter("pass");

    try {
        application.setAttribute("uname", name);

        String sql = "SELECT * FROM user where username='"+name+"' and
password='"+pass+"' ";
        Statement stmt = connection.createStatement();
        ResultSet rs = stmt.executeQuery(sql);
```

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```
        if (rs.next()==true)
        {
            String sql1="SELECT * FROM user where
username='"+name+"' and status='Authorized' ";
            Statement stmt1 = connection.createStatement();
            ResultSet rs1 =stmt1.executeQuery(sql1);
            if(rs1.next()==true)
            {
                int i = rs1.getInt(1);

                application.setAttribute("uid", i);
                response.sendRedirect("UserMain.jsp");
            }
            else
            {
                %>
                <br/><p>You are not Authorized by Admin,
Please wait!! </p><br/><br/><a href="UserLogin.jsp">Back</a>
                <%
                }
            }
            else
            {
                out.println("Invalid Login Details, Please Try
Again!!!");
                %><br/><br/><a href="UserLogin.jsp">Back</a><%
            }
        }
    }
}
```

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```
    }  
    catch (Exception e)  
    {  
        out.print(e);  
        e.printStackTrace();  
    }  
%>
```

7. TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, subassemblies, assemblies and/or a finished product. It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

7.1. TYPES OF TESTS

7.1.1. Unit testing

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application. It is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

7.1.2. Integration testing

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfactory, as shown by successful unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

7.1.3. Functional test

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centred on the following items:

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- Valid Input : identified classes of valid input must be accepted.
- Invalid Input : identified classes of invalid input must be rejected.
- Functions : identified functions must be exercised.
- Output : identified classes of application outputs must be exercised.
- Systems/Procedures : interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

7.2. System Test

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

White Box Testing

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reached from a black box level.

Black Box Testing

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot “see” into it. The test provides inputs and responds to outputs without considering how the software works.

7.3. Unit Testing

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

7.3.1. Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

7.3.2. Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

7.3.3. Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

7.4. Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

7.5. SYSTEM TESTING

7.5.1. TESTING METHODOLOGIES

The following are the Testing Methodologies:

- Unit Testing.
- Integration Testing.
- User Acceptance Testing.
- Output Testing.
- Validation Testing.

Unit Testing

Unit testing focuses verification effort on the smallest unit of Software design that is the module. Unit testing exercises specific paths in a module's control structure to ensure complete coverage and maximum error detection. This test focuses on each module individually, ensuring that it functions properly as a unit. Hence, the naming is Unit Testing.

During this testing, each module is tested individually and the module interfaces are verified for the consistency with design specification. All-important processing paths are tested for the expected results. All error handling paths are also tested.

Integration Testing

Integration testing addresses the issues associated with the dual problems of verification and program construction. After the software has been integrated a set of high order tests are conducted. The main objective in this testing process is to take unit tested modules and builds a program structure that has been dictated by design.

The following are the types of Integration Testing:

1. Top-down Integration

This method is an incremental approach to the construction of program structure. Modules are integrated by moving downward through the control hierarchy, beginning with the main program module. The module subordinates to the main

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program module are incorporated into the structure in either a depth first or breadth first manner.

In this method, the software is tested from main module and individual stubs are replaced when the test proceeds downwards.

2. Bottom-up Integration

This method begins the construction and testing with the modules at the lowest level in the program structure. Since the modules are integrated from the bottom up, processing required for modules subordinate to a given level is always available and the need for stubs is eliminated. The bottom up integration strategy may be implemented with the following steps:

- The low-level modules are combined into clusters into clusters that perform a specific Software sub-function.
- A driver (i.e.) the control program for testing is written to coordinate test case input and output.
- The cluster is tested.
- Drivers are removed and clusters are combined moving upward in the program structure.

The bottom up approaches tests each module individually and then each module is module is integrated with a main module and tested for functionality.

7.6. OTHER TESTING METHODOLOGIES

7.6.1. User Acceptance Testing

User Acceptance of a system is the key factor for the success of any system. The system under consideration is tested for user acceptance by constantly keeping in touch with the prospective system users at the time of developing and making changes wherever required. The system developed provides a friendly user interface that can easily be understood even by a person who is new to the system.

7.6.2. Output Testing

After performing the validation testing, the next step is output testing of the proposed system, since no system could be useful if it does not produce the required output in the specified format. Asking the users about the format required by them tests the outputs generated or displayed by the system under consideration. Hence the output format is considered in 2 ways – one is on screen and another in printed format.

7.6.3. Validation Checking

Validation checks are performed on the following fields.

7.6.4. Text Field:

The text field can contain only the number of characters lesser than or equal to its size. The text fields are alphanumeric in some tables and alphabetic in other tables. Incorrect entry always flashes and error message.

7.6.5. Numeric Field:

The numeric field can contain only numbers from 0 to 9. An entry of any character flashes an error messages. The individual modules are checked for accuracy and what it has to perform. Each module is subjected to test run along with sample data. The individually tested modules are integrated into a single system. Testing involves executing the real data information is used in the program the existence of any program defect is inferred from the output. The testing should be planned so that all the requirements are individually tested.

A successful test is one that gives out the defects for the inappropriate data and produces an output revealing the errors in the system.

7.6.6. Preparation of Test Data

Taking various kinds of test data does the above testing. Preparation of test data plays a vital role in the system testing. After preparing the test data the system under study is tested using that test data. While testing the system by using test data errors are again uncovered and corrected by using above testing steps and corrections are also noted for future use.

7.6.7. Using Live Test Data:

Live test data are those that are actually extracted from organization files. After a system is partially constructed, programmers or analysts often ask users to key in a set of data from their normal activities. Then, the systems person uses this data as a way to partially test the system. In other instances, programmers or analysts extract a set of live data from the files and have they entered themselves.

It is difficult to obtain live data in sufficient amounts to conduct extensive testing. And, although it is realistic data that will show how the system will perform for the typical processing requirement, assuming that the live data entered are in fact typical, such data generally will not test all combinations or formats that can enter the system. This bias toward typical values then does not provide a true systems test and in fact ignores the cases most likely to cause system failure.

7.6.8. Using Artificial Test Data:

Artificial test data are created solely for test purposes, since they can be generated to test all combinations of formats and values. In other words, the artificial data, which can quickly be prepared by a data generating utility program in the information systems department, make possible the testing of all login and control paths through the program.

The most effective test programs use artificial test data generated by persons other than those who wrote the programs. Often, an independent team of testers formulates a testing plan, using the systems specifications.

The package “Virtual Private Network” has satisfied all the requirements specified as per software requirement specification and was accepted.

7.6.9. USER TRAINING

Whenever a new system is developed, user training is required to educate them about the working of the system so that it can be put to efficient use by those for whom the system has been primarily designed. For this purpose the normal working of the project

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was demonstrated to the prospective users. Its working is easily understandable and since the expected users are people who have good knowledge of computers, the use of this system is very easy.

7.6.10. MAINTAINENCE

This covers a wide range of activities including correcting code and design errors. To reduce the need for maintenance in the long run, we have more accurately defined the user's requirements during the process of system development. Depending on the requirements, this system has been developed to satisfy the needs to the largest possible extent. With development in technology, it may be possible to add many more features based on the requirements in future. The coding and designing is simple and easy to understand which will make maintenance easier.

7.7. TESTING STRATEGY:

A strategy for system testing integrates system test cases and design techniques into a well-planned series of steps that results in the successful construction of software. The testing strategy must co-operate test planning, test case design, test execution, and the resultant data collection and evaluation .A strategy for software testing must accommodate low-level tests that are necessary to verify that a small source code segment has been correctly implemented as well as high level tests that validate major system functions against user requirements.

Software testing is a critical element of software quality assurance and represents the ultimate review of specification design and coding. Testing represents an interesting anomaly for the software. Thus, a series of testing are performed for the proposed system before the system is ready for user acceptance testing.

7.7.1. SYSTEM TESTING:

Software once validated must be combined with other system elements (e.g. Hardware, people, and database). System testing verifies that all the elements are proper and that overall system function performance is achieved. It also tests to find discrepancies between the system and its original objective, current specifications and system documentation.

7.7.2. UNIT TESTING:

In unit testing different are modules are tested against the specifications produced during the design for the modules. Unit testing is essential for verification of the code produced during the coding phase, and hence the goals to test the internal logic of the modules. Using the detailed design description as a guide, important Conrail paths are tested to uncover errors within the boundary of the modules. This testing is carried out during the programming stage itself. In this type of testing step, each module was found to be working satisfactorily as regards to the expected output from the module.

In Due Course, latest technology advancements will be taken into consideration. As part of technical build-up many components of the networking system will be generic in nature so that future projects can either use or interact with this. The future holds a lot to offer to the development and refinement of this project.

8. SCREENSHOTS

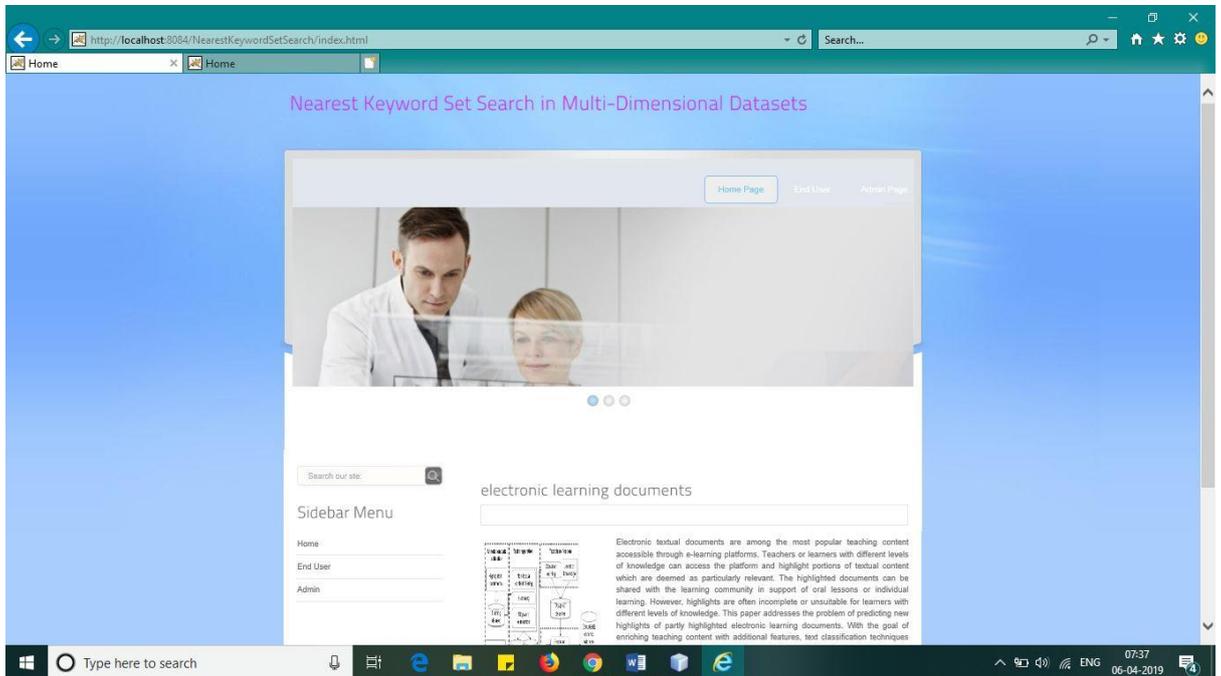


Fig1: Home page

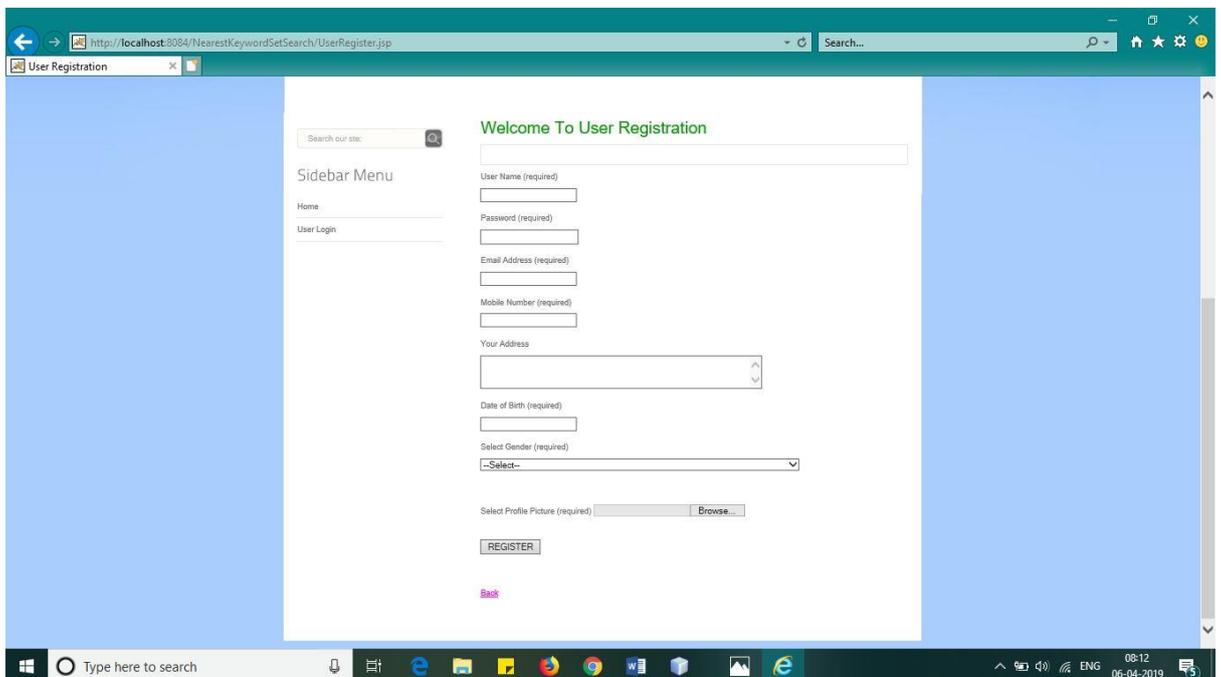


Fig2: User registration

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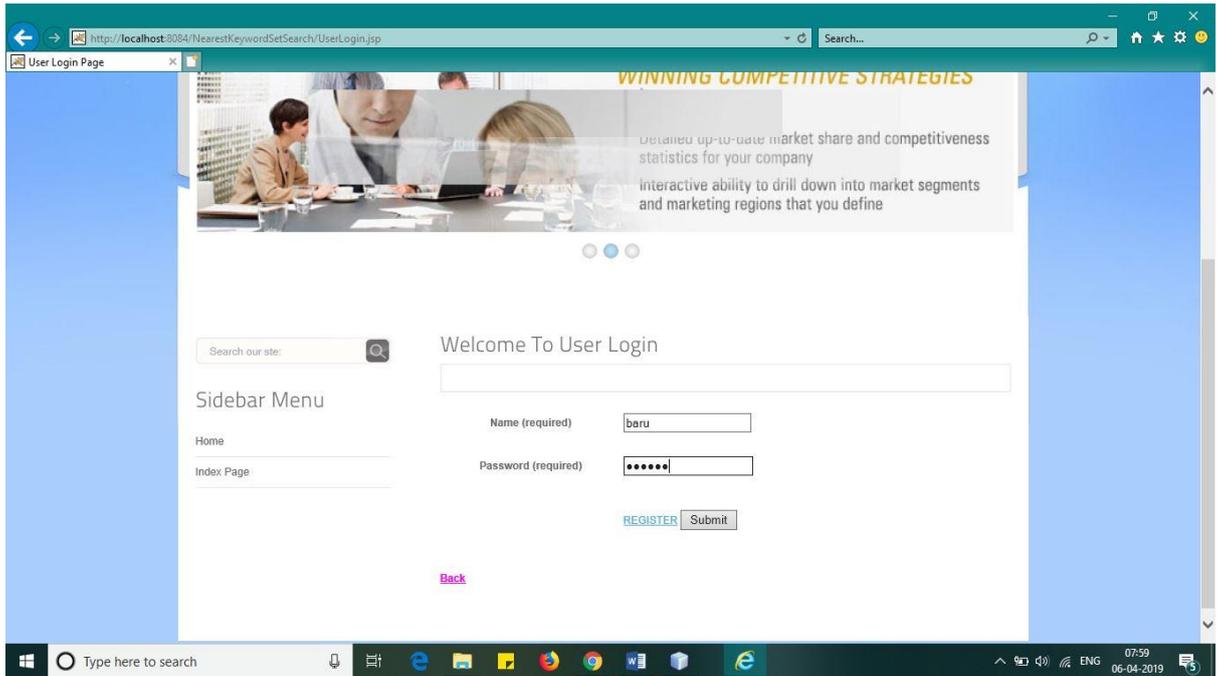


Fig3: User login

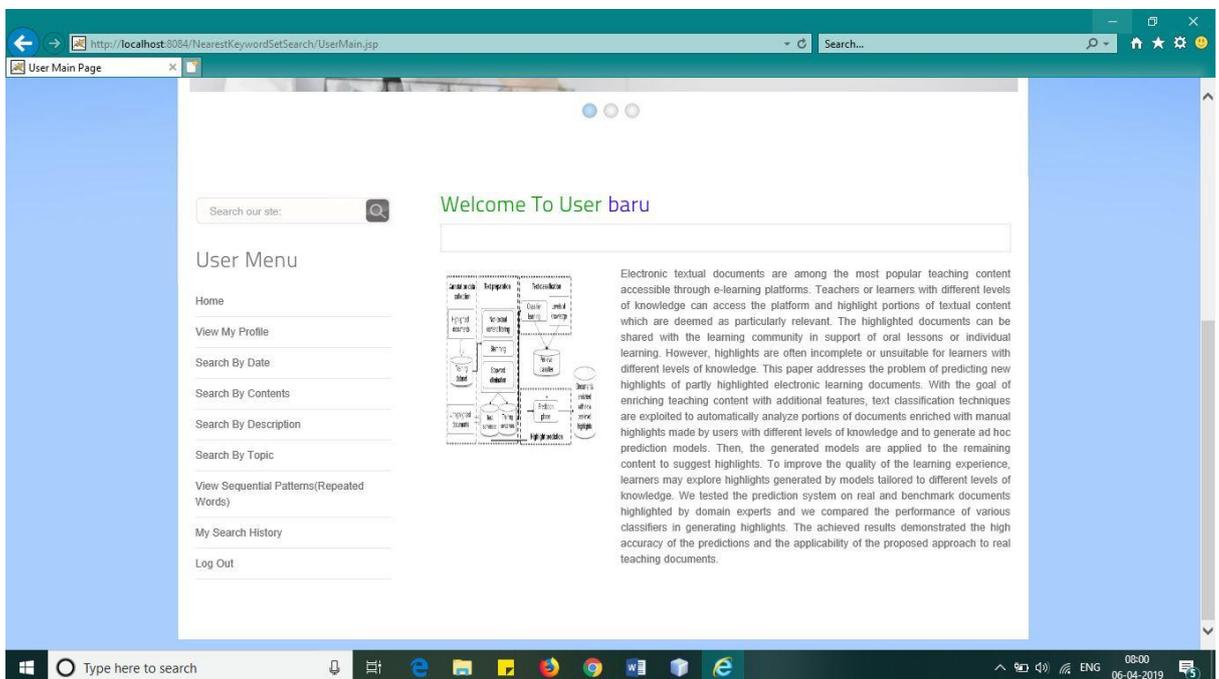


Fig4: User home page

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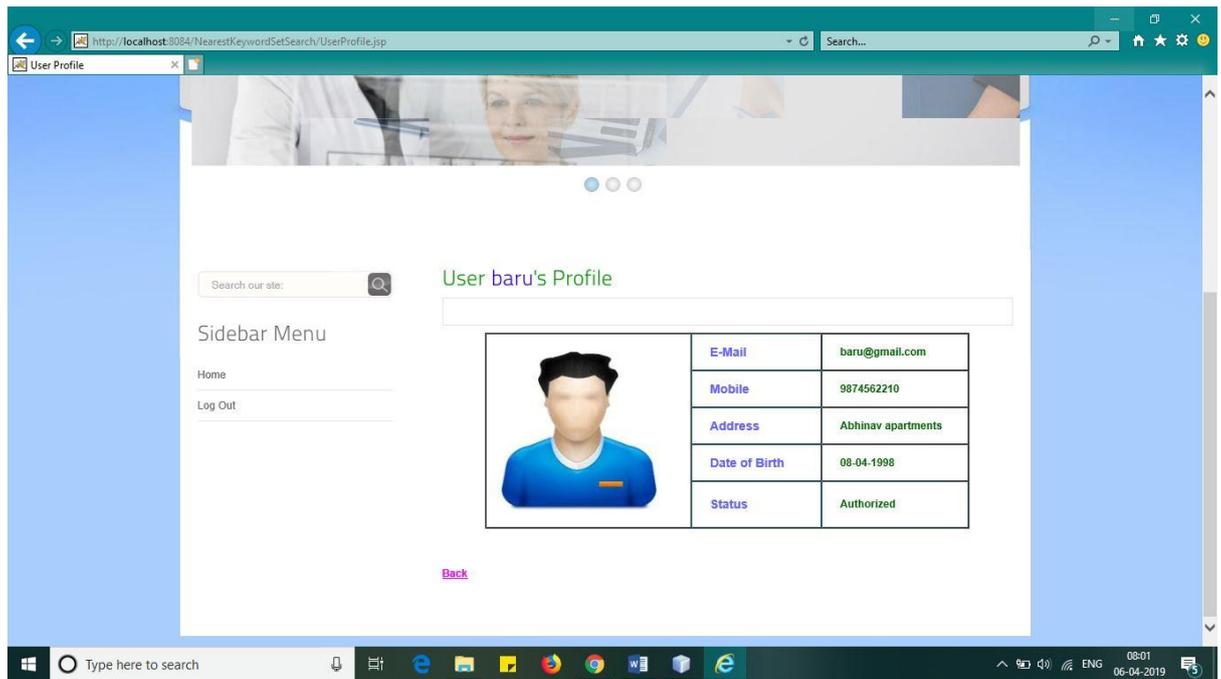


Fig5: View user profile

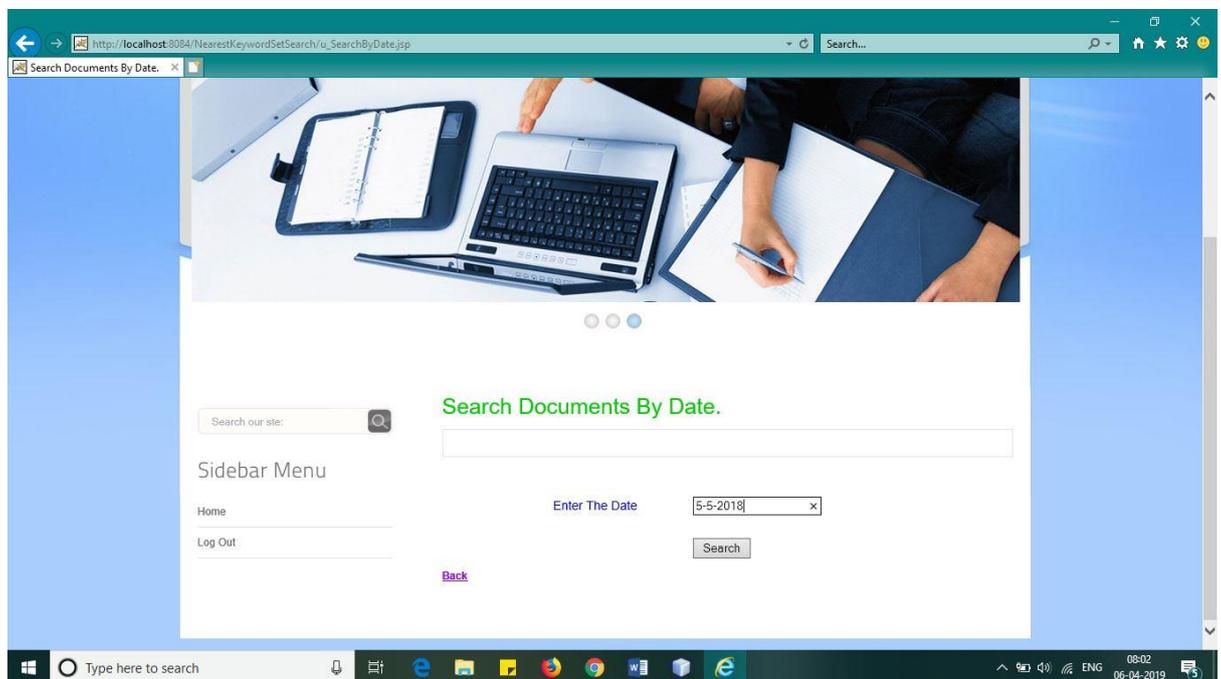


Fig6: Search by date

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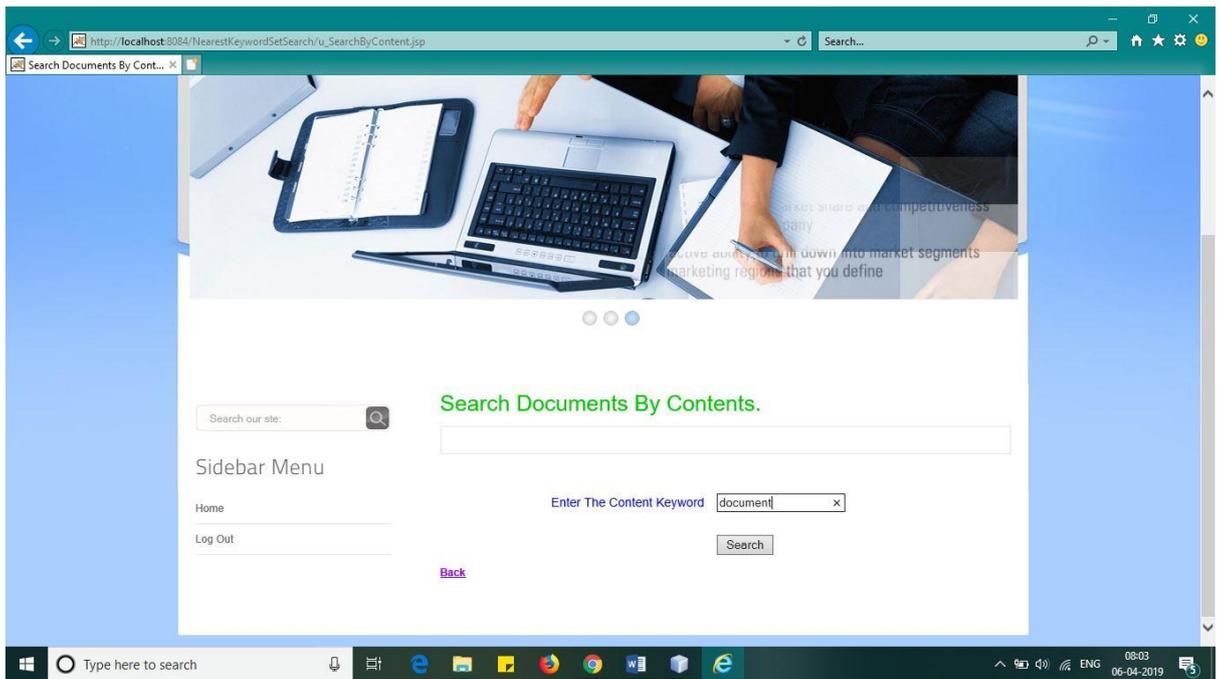


Fig7: Search by Content

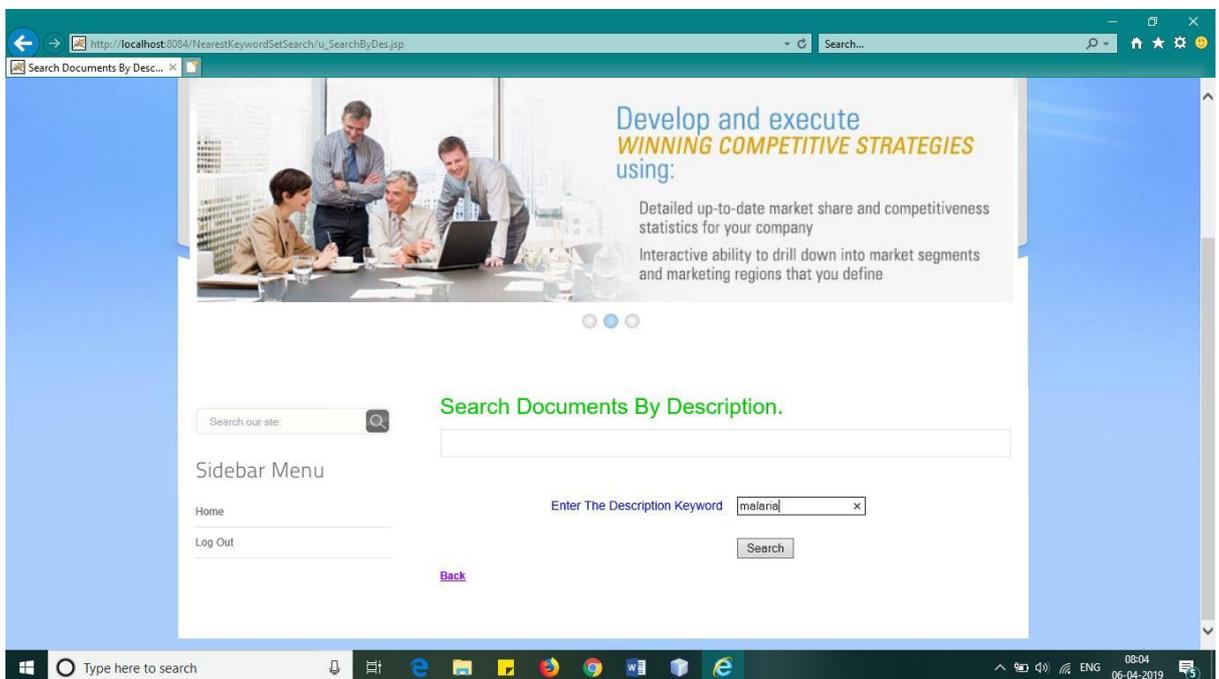


Fig8: Search by description

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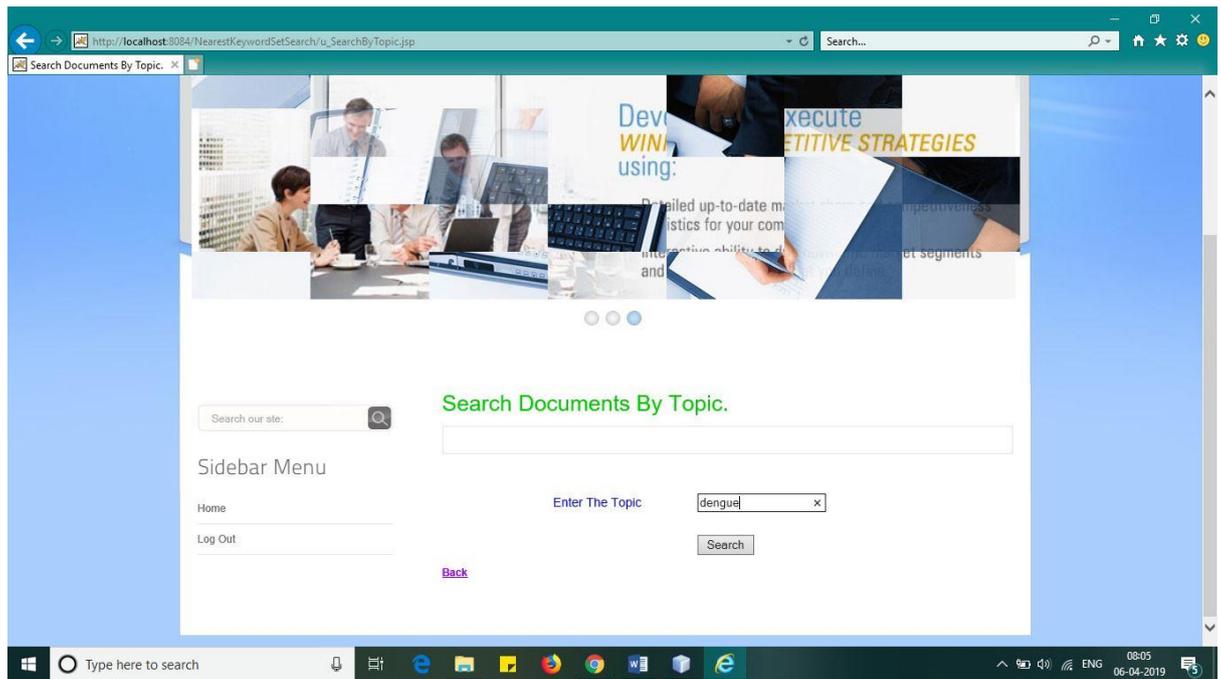


Fig9: Search by topic

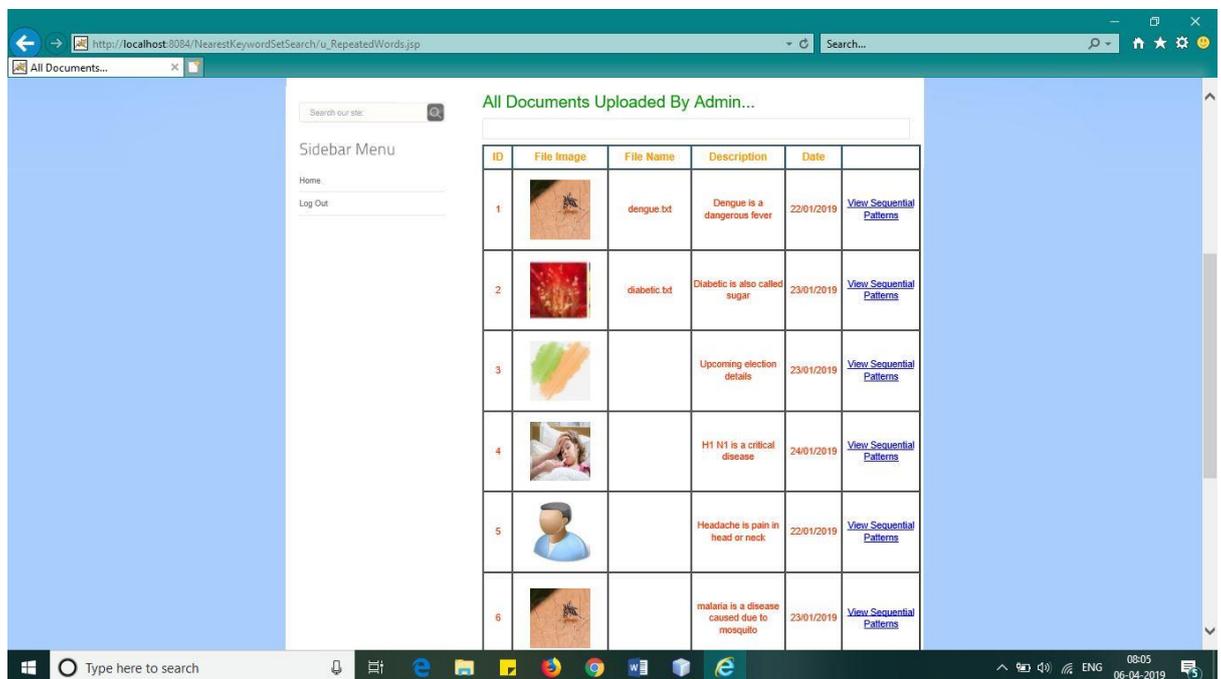
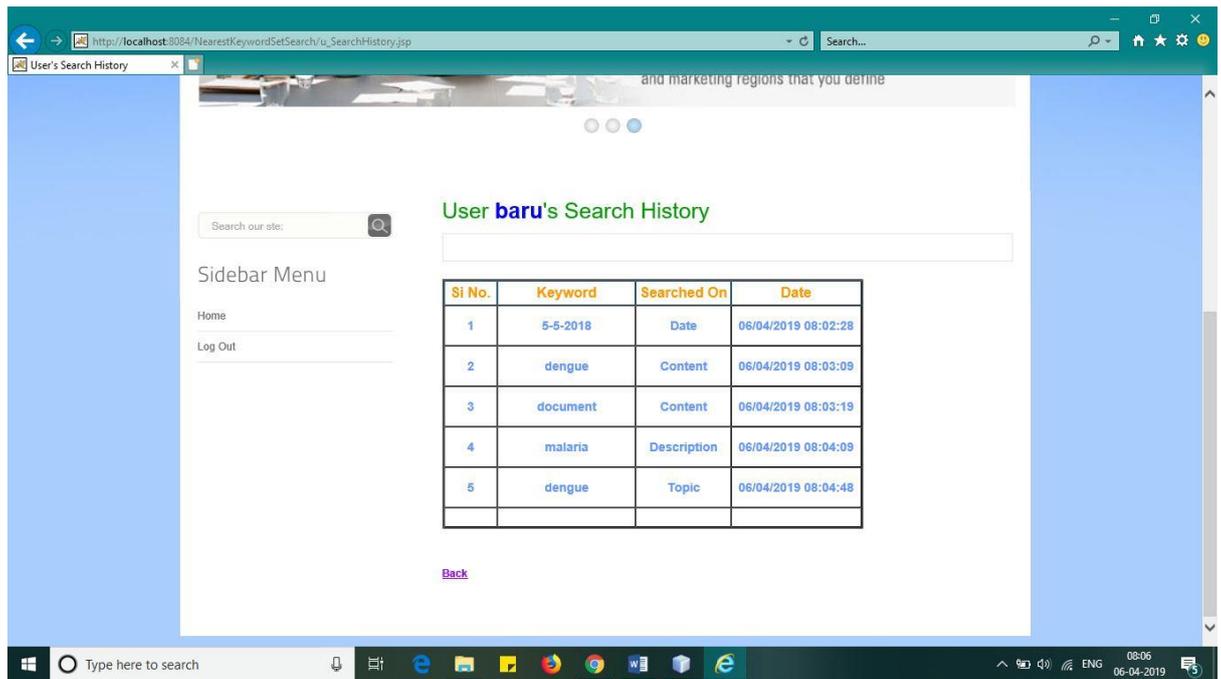


Fig10: View sequential patterns – uploaded by admin

Nearest Keyword Set Search In Multidimensional Datasets



Search our site:

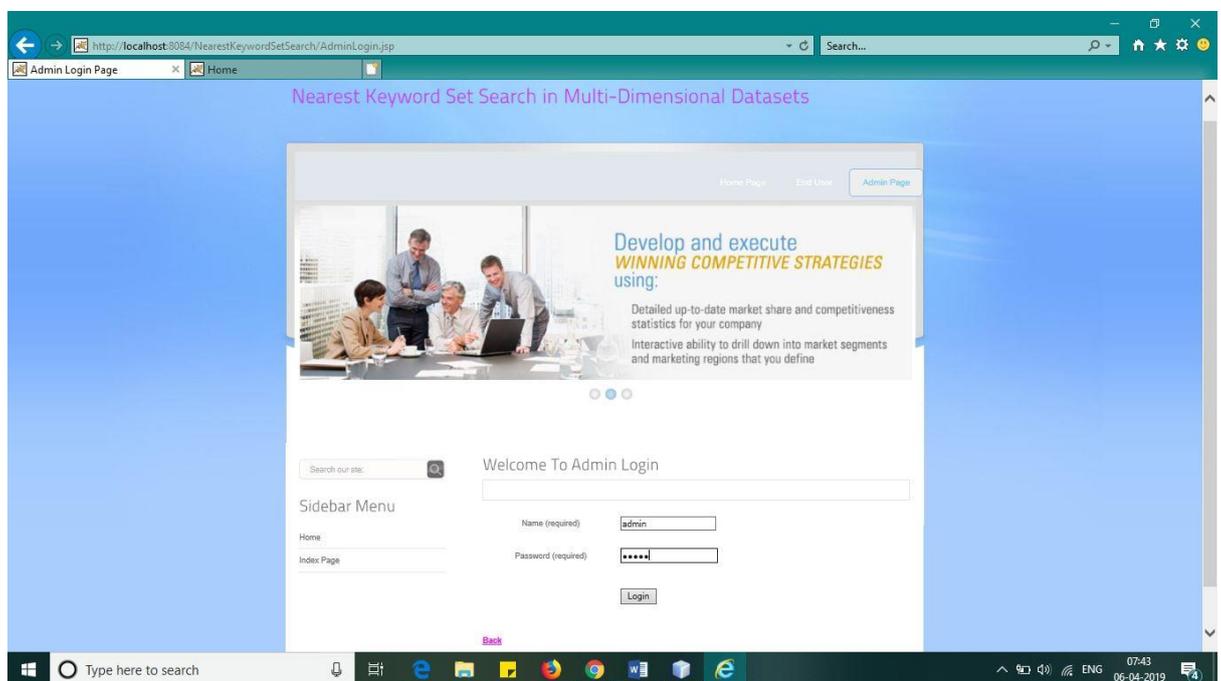
Search...

User baru's Search History

Si No.	Keyword	Searched On	Date
1	5-5-2018	Date	06/04/2019 08:02:28
2	dengue	Content	06/04/2019 08:03:09
3	document	Content	06/04/2019 08:03:19
4	malaria	Description	06/04/2019 08:04:09
5	dengue	Topic	06/04/2019 08:04:48

[Back](#)

Fig11: User's search history



Nearest Keyword Set Search in Multi-Dimensional Datasets

Home Page | End User | Admin Page

Develop and execute **WINNING COMPETITIVE STRATEGIES** using:

Detailed up-to-date market share and competitiveness statistics for your company
Interactive ability to drill down into market segments and marketing regions that you define

Welcome To Admin Login

Search our site:

Search...

Name (required)

Password (required)

[Back](#)

Fig12: Admin login

Nearest Keyword Set Search In Multidimensional Datasets

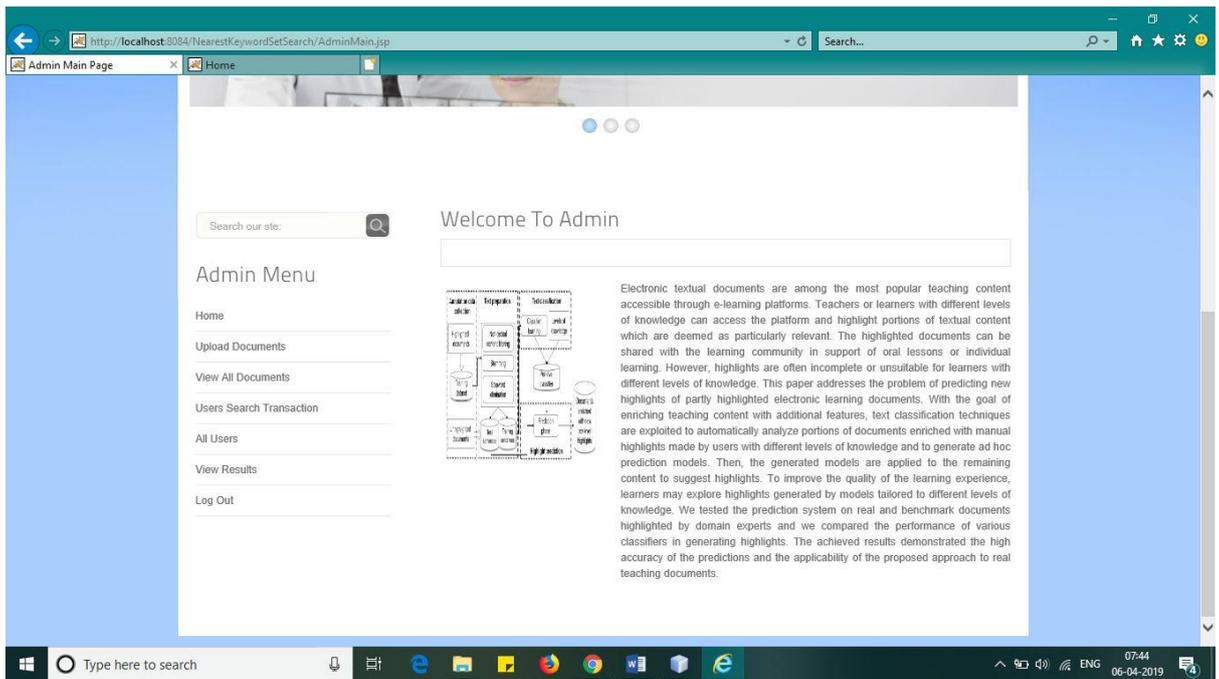


Fig13: Admin home page

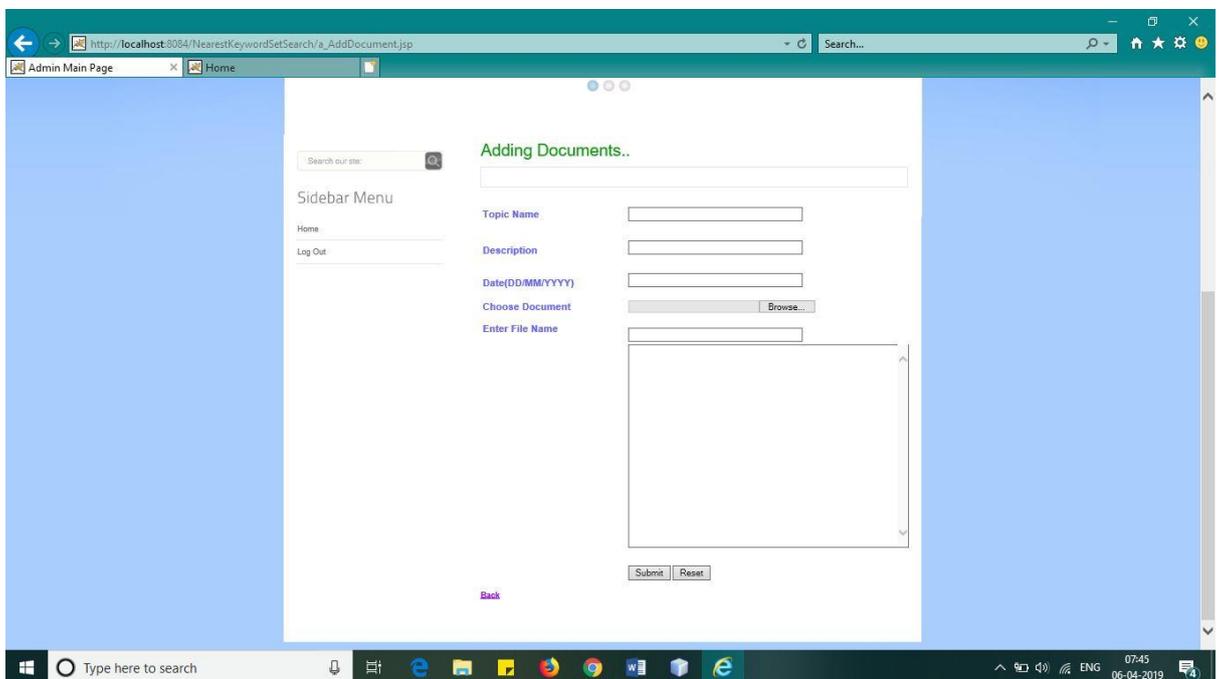


Fig14: Uploading a document

Nearest Keyword Set Search In Multidimensional Datasets

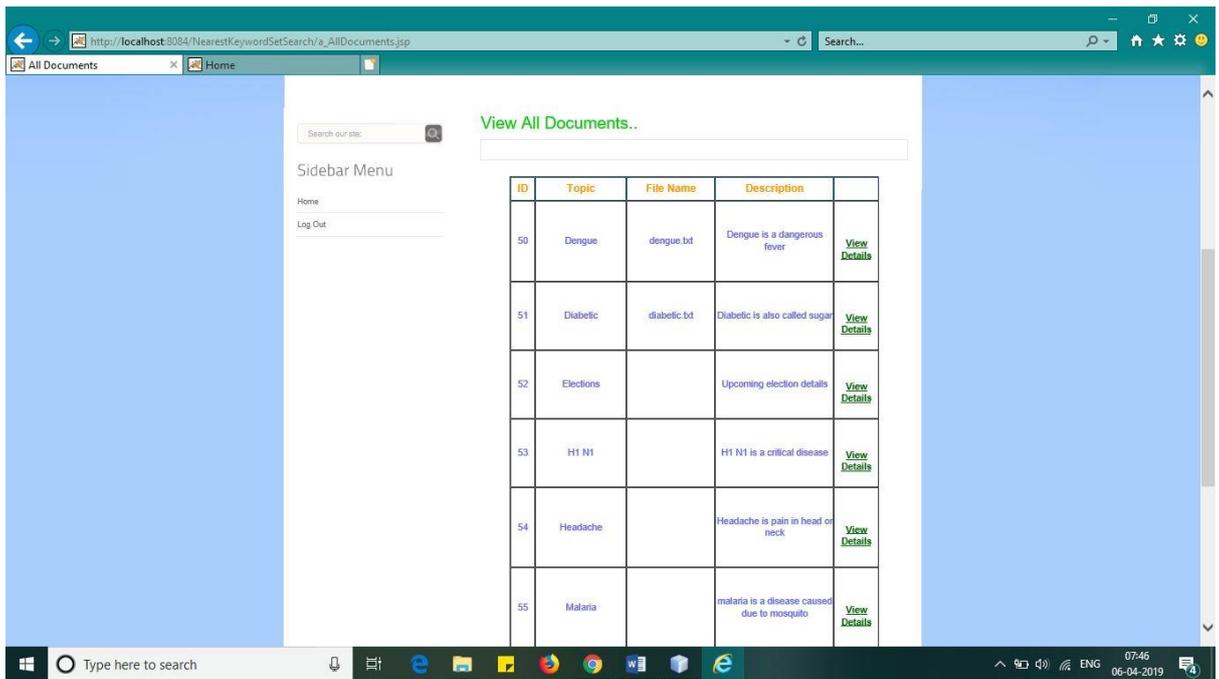


Fig14: View all documents

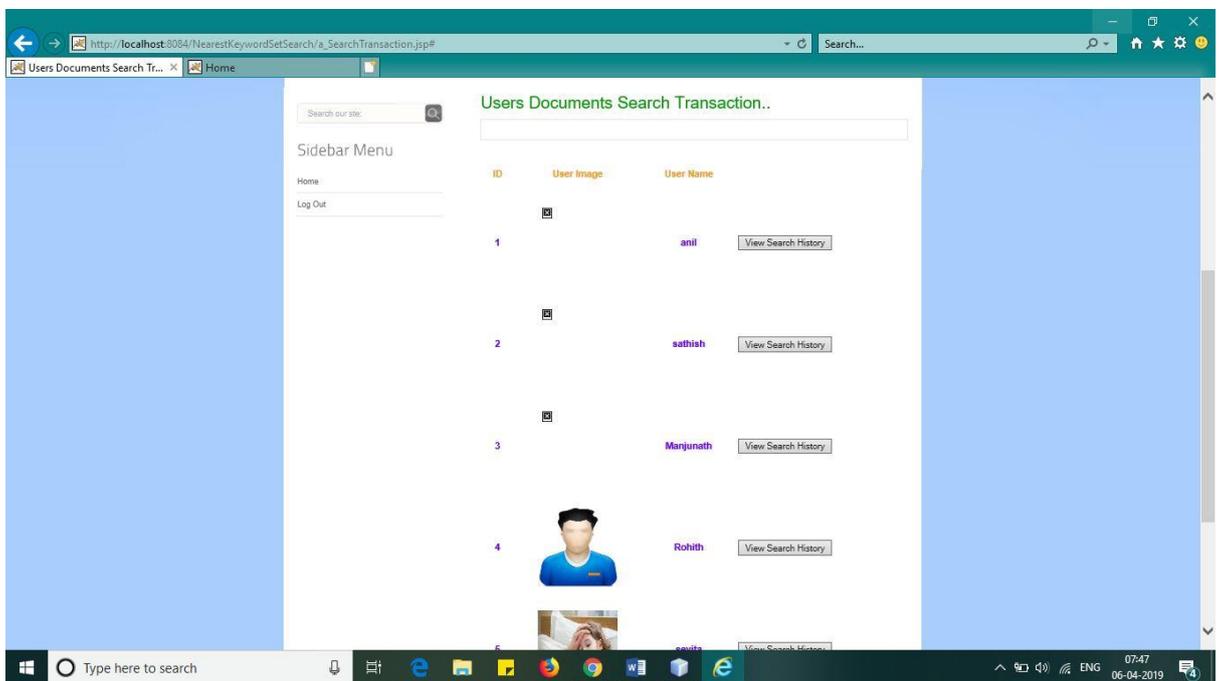


Fig15: User search transaction

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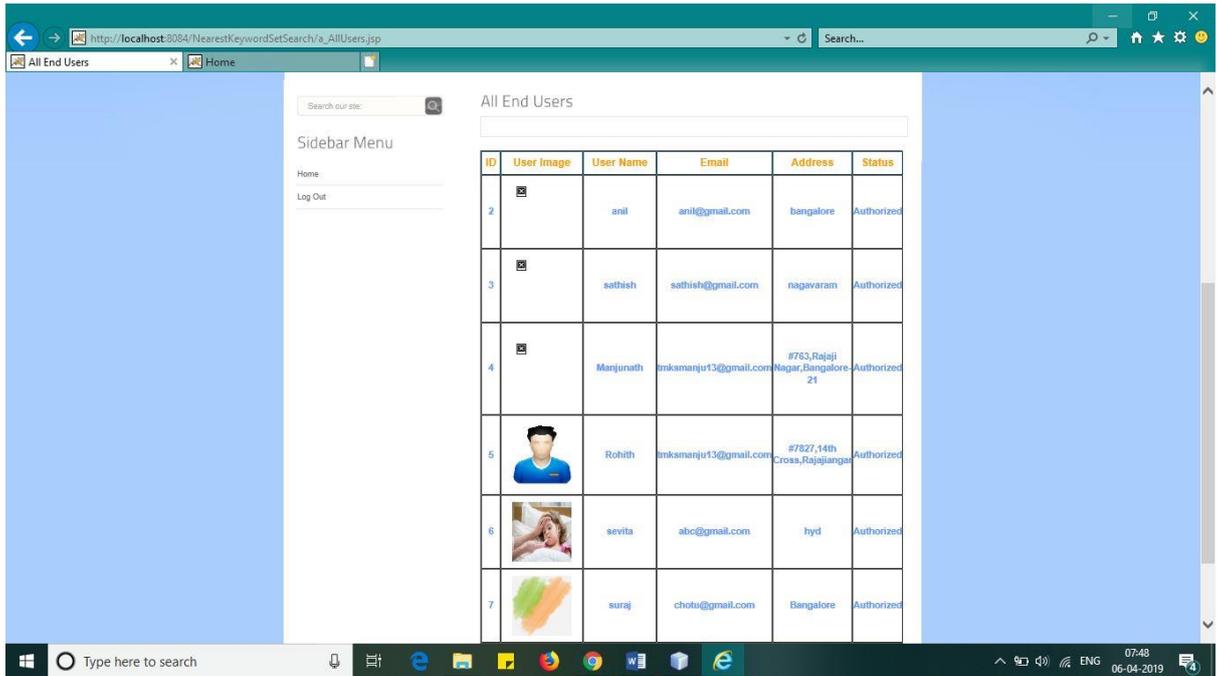


Fig16: View all end users

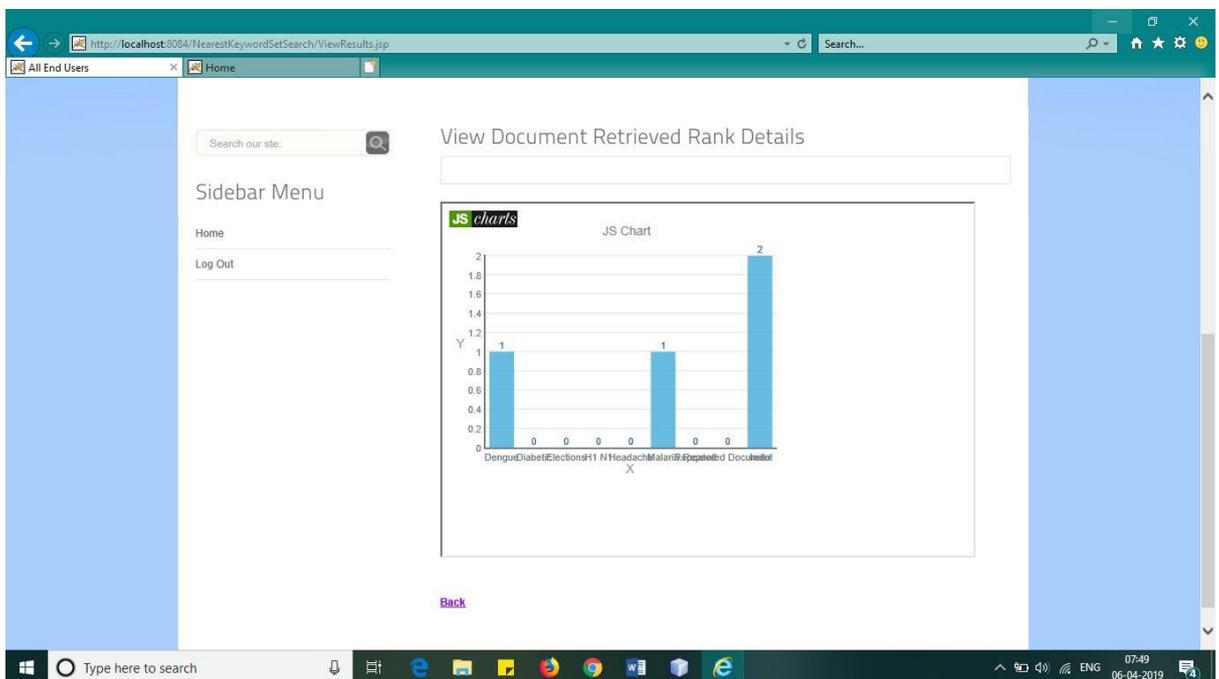


Fig17: View results

9. CONCLUSION

This project proposes highlighter, a new approach to automatically generating highlights of learning documents. It generates classification models tailored to different levels of knowledge from a set of highlighted documents to predict new highlights, which are provided to learners to improve the quality of their learning experience. A performance comparison between various classifiers on benchmark data and an analysis of the usability of the proposed approach on real document collections have been performed. In the current version of the system, highlights are not personalized. Specifically, the same highlights are deemed as appropriate for all the users having the same level of knowledge.

10. FUTURE ENHANCEMENTS

We aim at tailoring the automatically generated highlights to specific users. Therefore, we would like to generate not only unified and per-level models, but also user-centric models. Furthermore, we currently ignore the presence of textual annotations, which could enrich the document content with additional notes or rephrases. We plan to analyse such automatically generated content to gain insights into the level of knowledge of learners.

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A Project Report on
NESSUKA
Submitted to
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD
(In partial fulfillment of the requirements for the award of bachelor degree)
BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING
By
KRISHNA MOORTHY (14QM1A0553)

Under the esteemed guidance of
Mr.L.Raghu Kumar
Assistant Professor, Department of CSE



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KG REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY
Approved by AICTE, New Delhi, Affiliated to JNTUH Hyderabad.
Chilkur Vill, Moinabad Mandal, R.R.Dist-501504, P: 9247033008, 9000633008.
Batch: 2014-18



KG REDDY

College of Engineering
& Technology

Approved by AICTE, New Delhi, Affiliated to JNTUH Hyderabad. Chilkur Vill,
Moinabad Mandal, R.R.Dist-501504, P: 9247033008, 9000633008. W: kgr.ac.in

CERTIFICATE

This is to certify that the project entitled “**NESSUKA**” is being submitted by, **KRISHNA MOORTHY-14QM1A0553** of B.Tech in partial fulfillment of the requirement for the award of the degree in **BACHELOR OF TECHNOLOGY** in **COMPUTER SCIENCE AND ENGINEERING**, to the Jawaharlal Nehru Technological University, Hyderabad, is a record of the bonafide work carried out by them under our guidance and supervision. The results embodied in this project have not been submitted to any other University or Institute for the award of any degree or diploma.

L.RAGHU KUMAR
(Assistant Professor)
INTERNAL GUIDE

M.SAIDI REDDY
(Associate Professor)
HEAD OF THE DEPARTMENT

EXTERNAL EXAMINER



NATIONAL
INFORMATICS
CENTRE

data.gov 
Open Government Data (OGD) Platform India

IAMAI
Internet And Mobile Association Of India

#startupindia 

#OpenGovDataHack

CERTIFICATE

Runners-up App – Other Category

This is to Certify that KRISHNA MOORTHY has been declared as a Runners-up under App Category (Others) for "Open Government Data Hackathon" organized by National Informatics Centre, in association with IAMAI & Startup India on 4th and 5th Nov, 2017 at JNTU Hyderabad .

We wish you a successful future.



National Informatics Centre



Internet and Mobile Association of India



Hybrid Software Enterprises Association



Certificate of Participation

Awarded to

Krishna Moorthy

bearing Reg. No. *14QM1A0553* from *KG Reddy College of Engineering & Technology*

Branch/Year: *CSE/III* has participated in *iMake: IoT Maker Space*

from *June 2016 to November 2017*, organized by *TASK & HYSEA*.

President
HYSEA

Chief Executive Officer
TASK

TASK/iMake/0472/2016-17

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KRISHNA MOORTHY

(14QM1A0553)

ABSTRACT

Water Covers about 71% of our Earth. But we still face scarcity of water and drought conditions. This is because about 70% of water is salt water which cannot be used for day to day usage. Only 1% of water is consumable and usable.

In order to solve this water scarcity, we have to hold every drop of rain water safely to use it. Our Solution provides an easy way to preserve rain water and utilize them in unconditional situations.

NESSUKA checks the purity level of water by using IOT technology. We use sensors to check the purity and also we are providing additional feature to check the level of water present in the tank (House hold). We developed this prototype by using pH sensor, TDS sensor and ultrasonic sensors. These sensors values are stored in the webpage and this can be used for further reference. The user can check the status of the tank through mobile application or web application. The user can able to add multiple devices by entering the device ID which we are providing as unique for each product. And also he can view the number of working pumps under his current locality. This data can be helpful to the government to develop the city.

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INTRODUCTION

1. INTRODUCTION

1.1 Over view:

In this chapter, we are going to briefly discuss the importance of “NESSUKA” developed for the Water purity and also we are providing additional feature to check the level of water present in the tank. We are also going to discuss the basic function of The Water Purity checking that are achieved through this project. The following content will describe the given problem and the proposed system that was meant to be developed.

1.2 Motivation:

Universally, requirement for freshwater will continue to rise significantly over the coming decades to meet the needs of increasing populations, growing economies, changing lifestyles and evolving consumption patterns. This will greatly amplify the pressure on limited natural resources and ecosystems. Water is undoubtedly the most vital parameter among the natural resources. In modern societies proper management of wastewater is a necessity, not an option. Unsafe water and sanitation account for almost one tenth of the global burden of disease. Total 768 million and 2.5 billion people in the world are living without access to clean water and proper sanitation, respectively. According to the World Commission on water for the 21st century, more than half of the world’s major rivers are depleted and contaminated to the extent that they threaten human health and poison the surrounding ecosystems .Contaminated drinking water can cause various diseases such as typhoid fever, dysentery, cholera and other intestinal diseases. In developing countries, about 1.8 million people, mostly children, die every year as a result of water quality related diseases. So our project aims in providing a very reliable and very user friendly solution to overcome this problem.

As we know the advancements in the Arduino, NodeMCU and IOT and making use of those existing technologies we can design a device which is capable of identifying quality of water by using standard parameters like pH^[9] and Total Dissolved Solutions (TDS)

We are designed an android mobile application which acts as the medium of communication between an Arduino, NodeMCU^[8] other hardware and User. The major advantage of this system is the use IOT which makes this system unique.

1.3 Objective of the Project:

1.3.1 Existing System:

Identifying contaminants in your water is the first step to treating it. Having accurate measurements of your water's chemistry is crucial when planning a system and pretreatment design to ensure long-term reliable performance. Applied Membranes carries a large selection of water quality testers, ranging from pocket testers to analytical instrumentation for measuring each product has one indication like Silt Density Index (SDI) or Total Dissolved Solutions (TDS) or Oxidation-Reduction Potential (ORP), Conductivity, and other water quality characteristics. But there were few problems faced due to the existed technology .The main problem was with the size .So in order to make this system more compact and to increase the applications we have replaced embedded with Arduino^{[5][6][7]} ,which is an open source hardware and software.

1.3.2 Proposed System:

Our project aim in reducing the overall cost instead of buying multiple products for checking water quality. We have come up with one product which gives multiple parameters i.e. pH, TDS & Level of water for checking water quality. We are using couple of sensors to check the purity and also we are providing additional feature to check the level of water present in the tank (House hold).We are designed an android mobile application which acts as the medium of communication between an Arduino, NodeMCU^[8] other hardware and User. We have used the concept of IOT^{[10][11][12]} in our project.

1.4 Project Goals:

- To design a new product for the purpose of water checking by using characteristics like pH and TDS.
- To design an android mobile application for the product, each product has a unique key called as Product ID for keeping the record of day-to-day product parameters.
- To provide a Register page for the first time user, this has general information about user and Product ID.
- To provide Dynamic Login i.e., same login for all the users but the next screen changes according to the login credentials.
- To provide Product tracking system which gives the current details about the present pH value & Level of water present in tank.
- To provide Product ID new user created by admin.

BACKGROUND

2. BACKGROUND

2.1 Introduction:

In this chapter we will describe the information which we have gathered reading different research papers related to the Water Purity and also the technologies used to develop this project and we will see the block diagram and hardware description of the project in brief. In our system Arduino acts as the heart of the system, android applications connect used as the communication between product and user.

Vijay S. Kale, Member, IARJSET, Associate professor introduced a project on Consequence of Temperature, pH, Turbidity and Dissolved Oxygen Water Quality Parameters in the year 2016^[2]. The main aim of this project is to tell importance of testing the water before it is used for drinking, domestic, agricultural or industrial purpose. Water must be tested with different physicochemical parameters.

Sabrina Sorlini, Member, IEEE, Natalia Criado introduced a project on Assessment of Physical-Chemical Drinking Water Quality in the year 2015^[3]. The main aim of this project is to tell diseases are caused because of drinking water containing different types of chemicals and dust particles which are not visible so that many people are affected because of by drinking contaminated water.

TECHNOLOGIES USED

Here are various technologies used in this project.

2.2 IOT (Internet of Things):

The term Internet of Things was first coined by Kevin Ashton in 1999 in the context of supply chain management, sometimes referred to as the Internet of Objects, will change everything including ourselves. The Internet has an impact on education, communication, business, science, government, and humanity [1]. Clearly, the Internet is one of the most important and powerful creations in all of human history and now with the concept of the internet of things, internet becomes more favorable to have a smart life in every aspect [2]. Internet of Things is a new technology of the Internet accessing. By the Internet of Things,

objects recognize themselves and obtain intelligence behavior by making or enabling related decisions thinks to the fact that they can communicate information about themselves [3]. These objects can access information that has been aggregated by other things, or they can add to other services [3]. Figure 2.2.1 reviews that with the internet of things, anything's will able to communicate to the internet at any time from any place to provide any services by any network to anyone. This concept will create a new types of applications can involve such as smart vehicle and the smart home, to provide many services such as notifications, security, energy saving, automation, communication, computers and entertainment.

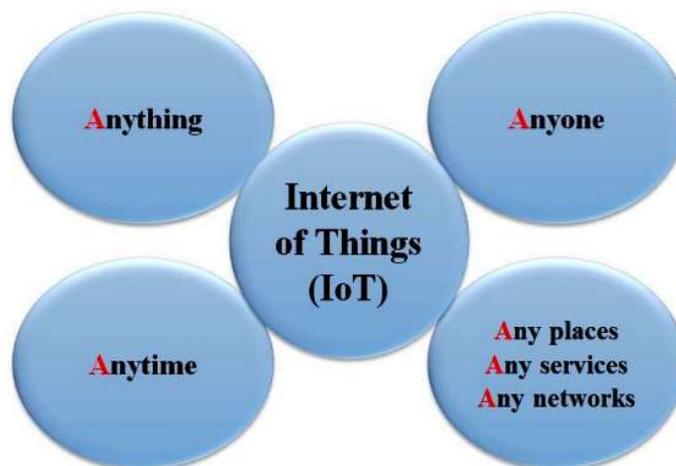


Figure 2.2.1 Internet Of Things Concept

However, in the past decade, the definition has been more inclusive covering wide range of applications like healthcare, utilities, transport, etc. Although the definition of „Things“ has changed as technology evolved, the main goal of making a computer sense information without the aid of human intervention remains the same. The rapid development of information technology (IT) has brought forward a hyper connected society in which objects are connected to mobile devices and the Internet and communicate with one another [2]. In the 21st century, we want to be connected with anything anytime and anywhere, which is already happening in various places around the world. The core component of this hyper connected society is IoT, which is also referred to as Machine to Machine (M2M) communication or Internet of Everything (IoE).

Fueled by the prevalence of devices enabled by open wireless technology such as Bluetooth, radio frequency identification (RFID), Wi-Fi, and telephonic data services as well as embedded sensor and actuator nodes, IoT has stepped out of its infancy and is on the verge of transforming the current static Internet into a fully integrated Future Internet. The Internet revolution led to the interconnection between people at an unprecedented scale and pace. Currently there are 9 billion interconnected devices and it is expected to reach 24 billion devices by 2020.

The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator or other connected devices. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.

A printed circuit board (PCB) is the basic part in industry for manufacturing of any electronic product. Etching is main process for developing a PCB. In etching machine, the etchant solution is distributed over the boards by nozzles and recirculated by pumps. Adjustment of the nozzle, temperature and etchant composition gives predictable control of etching rates and high production rate. Etching at ambient temperature might take over an hour, so it is better to heat up the etching solvent to about 35-45 degree Celsius. At higher temperatures the etching performance decreases, so it is necessary to control the temperature of solvent. So the proposed system continuously monitors the machine and at a specific condition it will take necessary action.

There are some types of technologies that enable the internet of things, Near-field communication and Radio Frequency Identification (RFID). In the 2000s, RFID was the dominant technology. After few years, NFC became dominant (NFC). NFC has become common in smart phones during the early 2010s, with uses such as reading NFC tags or for access to public transportation, Quick response codes and Optical tags. This is used for low cost tagging. Phone cameras decode QR code using image-processing techniques. All newly releasing Smartphone's have BLE hardware in them. Tags based on BLE can signal their presence at a power budget that enables them to operate for up to one year on a lithium coin cell battery.

2.3 Introduction to Arduino Board:

The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for their robots, to build new digital music instruments, or to build a system that lets your house plants tweet you when they're dry. Arduino (we use the standard Arduino Uno) are built around an AT mega microcontroller — essentially a complete computer with CPU, RAM, Flash memory, and input/output pins, all on a single chip. Unlike, say, a Raspberry Pi, it's designed to attach all kinds of sensors, LEDs, small motors and speakers, servos, etc. directly to these pins, which can read in or output digital or analog voltages between 0 and 5 volts. The Arduino connects to your computer via USB, where you program it in a simple language (C/C++, similar to Java) from inside the free Arduino IDE by uploading your compiled code to the board. Once programmed, the Arduino can run with the USB link back to your computer, or stand-alone without it — no keyboard or screen needed, just power.

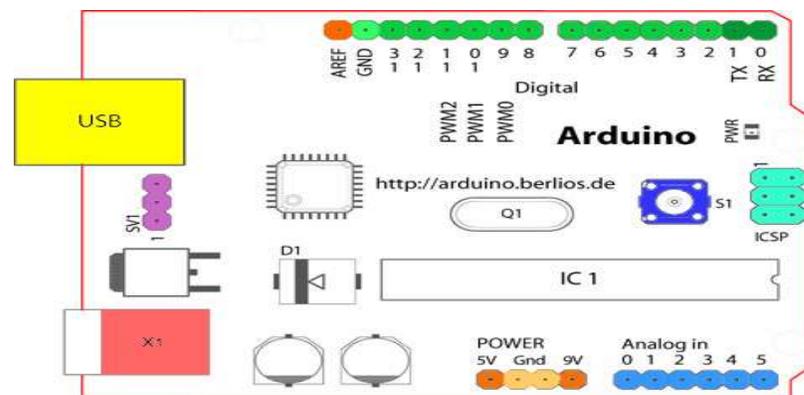


Fig 2.3.1 Structure of Arduino Board

Looking at the board from the top down, this is an outline of Arduino.

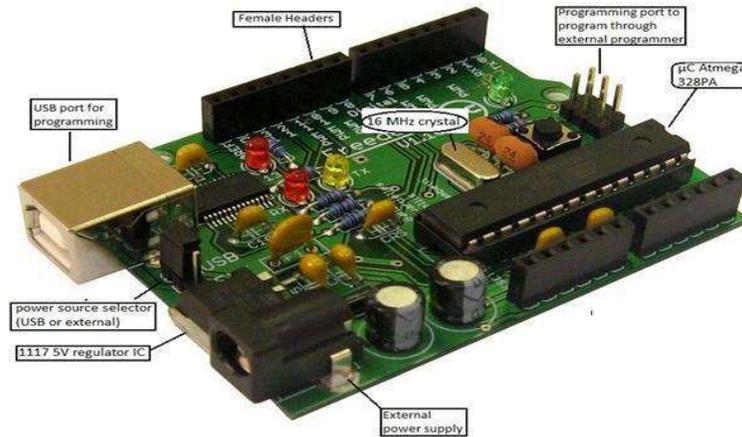


Fig 2.3.2 Arduino Board

Starting clockwise from the top center:

- Analog Reference pin (orange)
- Digital Ground (light green)
- Digital Pins 2-13 (green)
- Digital Pins 0-1/Serial In/Out - TX/RX (dark green) - These pins cannot be used for digital I/O (Digital Read and Digital Write) if you are also using serial communication (e.g. Serial. begin).
- Reset Button - S1 (dark blue)
- In-circuit Serial Programmer (blue-green)
- Analog In Pins 0-5 (light blue)
- Power and Ground Pins (power: orange, grounds: light orange)
- External Power Supply In (9-12VDC) - X1 (pink)
- Toggles External Power and USB Power (place jumper on two pins closest to desired supply) - SV1 (purple)
- USB (used for uploading sketches to the board and for serial communication between the board and the computer; can be used to power the board) (yellow)

2.3.1 Digital Pins:

In addition to the specific functions listed below, the digital pins on an Arduino board can be used for general purpose input and output via the pin Mode(), Digital Read(), and Digital Write() commands. Each pin has an internal pull-up resistor which can be turned on and off using digital Write () (w/ a value of HIGH or LOW, respectively) when the pin is configured as an input. The maximum current per pin is 40mA.

- Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. On the Arduino Diecimila, these pins are connected to the corresponding pins of the FTDI USB-to-TTL Serial chip. On
- The Arduino BT, they are connected to the corresponding pins of the WT11 Bluetooth module. On the Arduino Mini and LilyPad Arduino, they are intended for use with an external TTL serial module (e.g. the Mini-USB Adapter).
- External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attach Interrupt () function for details.
- PWM: 3, 5, 6, 9, 10, and 11 Provide 8-bit PWM output with the analog Write () function. On boards with an ATmega8, PWM output is available only on pins 9, 10, and 11.
- BT Reset: 7. (Arduino BT-only) Connected to the reset line of the Bluetooth module.
- SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication, which, although provided by the underlying hardware, is not currently included in the Arduino language.
- LED: 13. On the Diecimila and LilyPad, there is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

2.3.2 Analog Pins:

In addition to the specific functions listed below, the analog input pins support 10-bit analog-to-digital conversion (ADC) using the analog Read () function. Most of the analog inputs can also be used as digital pins: analog input 0 as digital pin 14 through analog input 5 as digital pin 19. Analog inputs 6 and 7 (present on the Mini and BT) cannot be used as digital pins.

2.3.3 Power Pins:

- VIN (sometimes labeled "9V"): The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin. Also note that the Lily Pad has no VIN pin and accepts only a regulated input.
- 5V: The regulated power supply used to power the microcontroller and other components on the board. This can come either from VIN via an on-board regulator, or be supplied by USB or another regulated 5V supply.
- 3V3 (Diecimila-only): A 3.3 volt supply generated by the on-board FTDI chip.
- GND: Ground pins.

2.4 JAVA:

2.4.1 What is Java technology?

Java is a programming language and computing platform first released by Sun Microsystems in 1995. There are lots of applications and websites that will not work unless you have Java installed, and more are created every day. Java is fast, secure, and reliable. From laptops to datacenters, game consoles to scientific supercomputers, cell phones to the Internet, Java is everywhere.

2.4.2 Is Java free to download?

On November 13, 2006, Sun released much of Java as free and open source software, (FOSS), under the terms of the GNU General Public License (GPL). On May 8, 2007, Sun finished the process, making all of Java's core code available under free software/open-source distribution terms, aside from a small portion of code to which Sun did not hold the copyright.

Open JDK (Open Java Development Kit) is a free and open source implementation of the Java programming language. It is the result of an effort Sun Microsystems began in 2006. The implementation is licensed under the GNU General Public License (GNU GPL) with a linking exception.

2.4.3 Why only Java?

The Java platform allows you to run the same Java application on lots of different kinds of computers. Any Java application can easily be delivered over the Internet, or any network, without operating system or hardware platform compatibility issues. For example, you could run a Java technology based application on a PC, a Macintosh computer, a network computer, or even new technologies like Internet screen phones.

2.4.4 What are the applications of Java?

Java technology allows programmers and users to do new things with Web pages that were not possible before. With Java technology, the Internet and private networks become your computing environment

2.4.5 What are the advantages of Java?

2.4.5.1 Ease of Use:

You don't need to be a mechanic to drive a car. Why should you have to be a "system administrator" to use a computer? With Java software, you don't have to be one. Java technology eliminates many of the problems associated with installing and running applications. That's because generally the Java user does not have to configure, load, or install anything. Instead, computing devices tap into the network and funnel its power to the user. Upgrades are automatic, making installation and configuration obsolete.

2.4.5.2 Ease of Development: Two Real-Life Examples:

Developing on the Java platform means that projects are completed faster and with less debugging. These two real-life examples serve as testimonials to this claim.

2.4.5.2.1 Life Time Fitness:-

Having completed sizable development projects over the last three years, using different technologies, Life Time Fitness has come to endorse only the Java 2 Platform, Enterprise Edition

for enterprise Web application development."Leveraging the J2EETM [platform's] suite of technologies enabled us to focus more of our technical resources on creating solutions to business problems, rather than laboring to maintain proprietary software from Microsoft or Allaire.

2.4.5.2.2 Friendly Giants and BLAM:

Mark Ripley and Jay Minn are two gaming industry seniors, now leaders of small, independent game-development companies that have created hit titles on their own for over five years using Java technology."We realized that we could use Java technology to write games once and deploy them across many platforms.. "We at BLAM! have always been true believers in Java technology as a viable gaming platform," said Jay Minn, president, BLAM! "By applying experience, we have been able to produce high quality & immediately accessible, fun games like BUMP! And Golf, based on Java technology, for our audiences." Friendly Giants and BLAM!

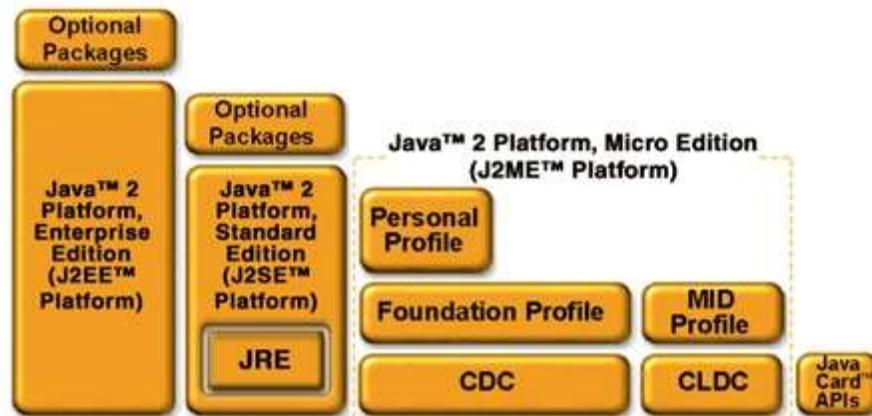


Figure 2.4.1 Java Overview

2.5 Android Studio:

Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA. On top of IntelliJ powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps, such as:

- A flexible Gradle-based build system.
- A fast and feature-rich emulator.

- A unified environment where you can develop for all Android devices.
- Instant Run to push changes to your running app without building a new APK.
- Code templates and Github integration to help you build common app features and import sample code.
- Lint tools to catch performance, usability, version compatibility, and other problems
- C++ and NDK support.
- Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine.

2.5.1 Project Structure:

Each project in Android Studio contains one or more modules with source code files and resource files. Types of modules include:

- Android app modules
- Library modules
- Google App Engine modules
- **Manifests:** Contains the AndroidManifest.xml file.
- **Java:** Contains the Java source code files, including JUnit test code.
- **Res:** Contains all non-code resources, such as XML layouts, UI strings, and bitmap images.

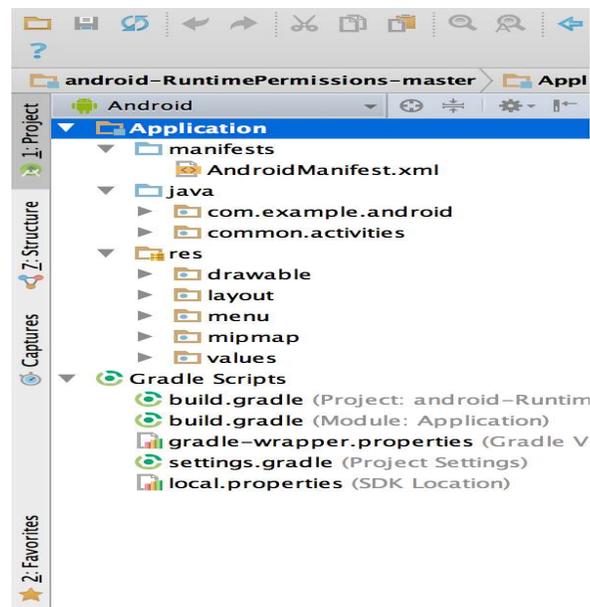


Figure 2.5.1 the project files in Android view.

User can also customize the view of the project files to focus on specific aspects of your app development. For example, selecting the **Problems** view of your project displays links to the source files containing any recognized coding and syntax errors, such as a missing XML element closing tag in a layout file.

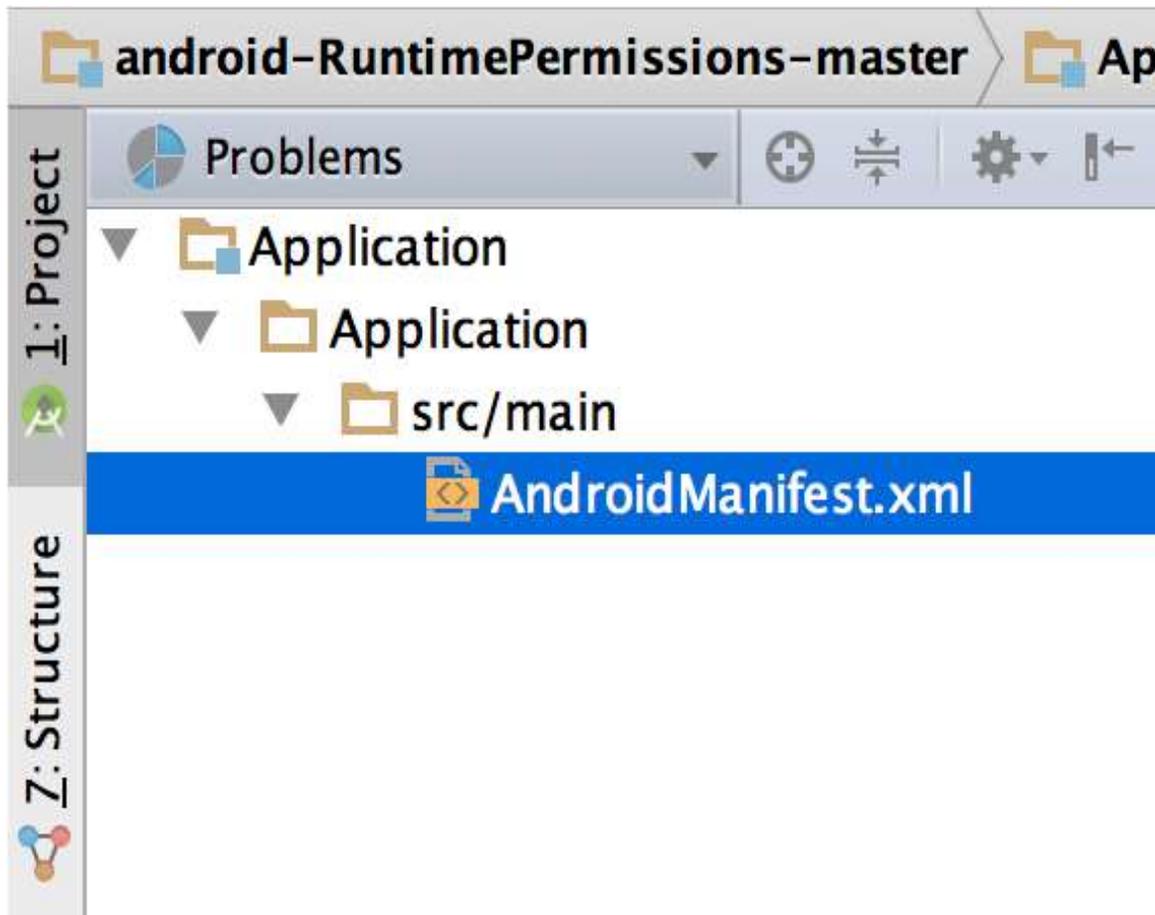


Figure 2.5.2: The project files in Problems view

2.5.2 The User Interface:

The Android Studio main window is made up of several logical areas identified as follow.

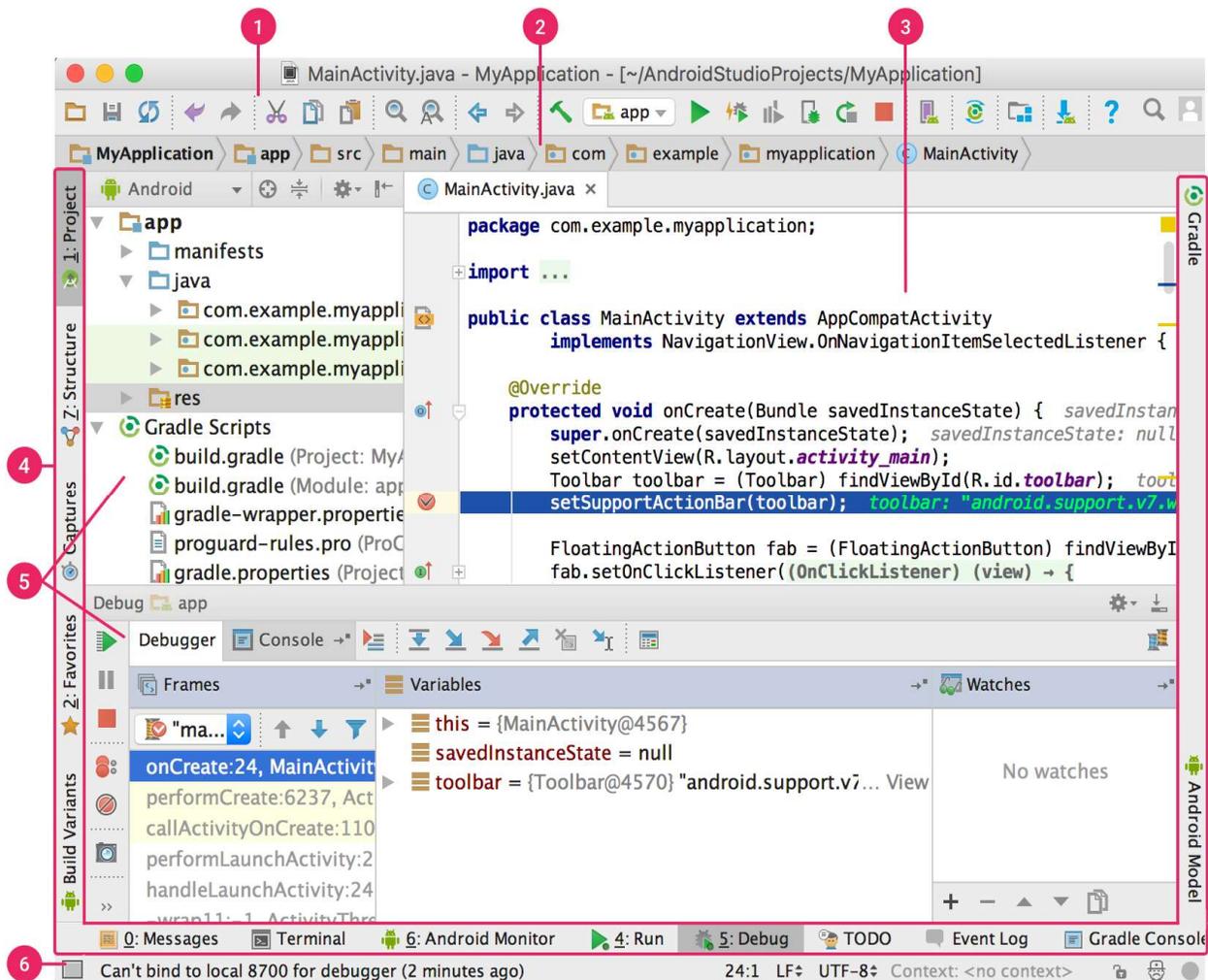


Figure 2.5.3 The Android Studio Main Window.

1. The **toolbar** lets you carry out a wide range of actions, including running your app and launching Android tools.
2. The **navigation bar** helps you navigate through your project and open files for editing. It provides a more compact view of the structure visible in the **Project** window.

3. The **editor window** is where you create and modify code. Depending on the current file type, the editor can change. For example, when viewing a layout file, the editor displays the Layout Editor.
4. The **tool window bar** runs around the outside of the IDE window and contains the buttons that allow you to expand or collapse individual tool windows.
5. The **tool windows** give you access to specific tasks like project management, search, version control, and more. You can expand them and collapse them.
6. The **status bar** displays the status of your project and the IDE itself, as well as any warnings or messages.

2.5.3 Prerequisite for Android Studio:

Criterion	Description
OS Version	Windows 7 or later Mac OS X 10.9.5 or later GNOME or KDE desktop Linux
RAM	8GB RAM Recommended
Disk Space	500MB
Java Version	Java Development Kit (JDK)8
Screen Resolution	1200 X 800 minimum screen resolution

Table 2.5.1: Prerequisite for android Studio

2.6 XML:

2.6.1 What is XML?

The essence of XML is in its name: Extensible Markup Language.

Extensible:

XML is extensible. It lets you define your own tags, the order in which they occur, and how they should be processed or displayed. Another way to think about extensibility is to consider that XML allows all of us to extend our notion of what a document is: it can be a file that lives on a file server, or it can be a transient piece of data that flows between two computer systems (as in the case of Web Services).

Markup:

The most recognizable feature of XML is its tags, or elements (to be more accurate). In fact, the elements you'll create in XML will be very similar to the elements you've already been creating in your HTML documents. However, XML allows you to define your own set of tags.

Language:

XML is a language that's very similar to HTML. It's much more flexible than HTML because it allows you to create your own custom tags. However, it's important to realize that XML is not just a language. XML is a meta-language: a language that allows us to create or define other languages. For example, with XML we can create other languages, such as RSS, MathML (a mathematical markup language), and even tools like XSLT. More on this later.

2.6.2 Why Do We Need XML?

Okay, we know what it is, but why do we need XML? We need it because HTML is specifically designed to describe documents for display in a Web browser, and not much else. It becomes cumbersome if you want to display documents in a mobile device or do anything that's even slightly complicated, such as translating the content from German to English. HTML's sole purpose is to allow anyone to quickly create Web documents that can be shared with other people. XML, on the other hand, isn't just suited to the Web – it can be used in a variety of different contexts, some of which may not have anything to do with humans interacting with content. HTML rarely (if ever) provide information about how the document is structured HTML is a presentation language, whereas XML is a data-description language.

2.7 Google Firebase:

2.7.1 History:

Back in 2011, before Firebase was Firebase, it was a startup called Envolv. As Envolv, it provided developers with an API that enabled the integration of online chat functionality into their website. This led the founders of Envolv, James Tamplin and Andrew Lee, to separate the chat system and the real-time architecture. In April 2012, Firebase was created as a separate company that provided Backend-as-a-Service with *real-time functionality*

2.7.2 Firebase features:

- **Analytics:** This feature enables the application developer to understand how users are using his application. The dashboard provides details like your most active user or what feature of your application is used most. It also provides you with summarized data.
- **Authentication:** Auth feature in firebase let you let only authorized users access you Application. Firebase provides login through Gmail, Github, twitter, face book and also let the developer create custom authentication. .
- **Real-time Database:** Database in firebase is a cloud-based database and does not need SQL-based queries to store and fetch data. Database is highly reliable and superfast means that data is updated and synchronized in no time and data is maintained even user lose internet connection
- **Storage:** Firebase also provides storage facility. It can store and retrieve content like images, videos and audio directly from client SDK. Uploading and downloading is done in the background. Data stores are safe and the only authorized user can access it.
- **Hosting:** Firebase is also used for hosting purposes. Firebase delivers web content very fast and content is always delivered securely
- **Crash reporting:** Crash reporting feature on firebase creates reports of error in your app after its release. Errors are grouped into different groups according to how severe error is. You can also create custom events to catch steps leading to the crashing of the application.

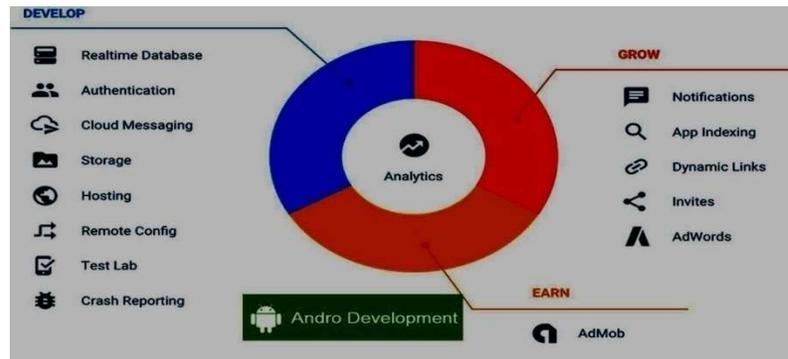


Figure 2.7.1 Firebase features.

2.7.3 Firebase as Real-time Database:

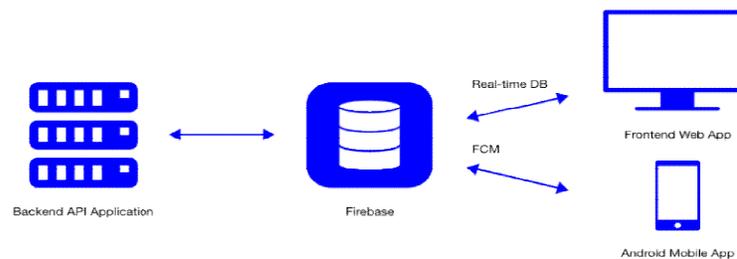


Figure 2.7.2 Firebase as Database.

Firestore is a mobile and web app development platform that Store and sync data with our NoSQL cloud database. Data is synced across all clients in real-time, and remains available when your app goes offline. The Firestore Real-time Database is a cloud-hosted database. Data is stored as JSON and synchronized in real-time to every connected client. When you build cross-platform apps with our iOS, Android, and JavaScript SDKs, all of your clients share one Real-time Database instance and automatically receive updates with the newest data.

How does it work?

The Firestore Real-time Database lets you build rich, collaborative applications by allowing secure access to the database directly from client-side code. Data is persisted locally, and even while offline, real-time events continue to fire, giving the end user a responsive experience. When the device regains connection, the Real-time Database synchronizes the local data changes with the remote updates that occurred while the client was offline, merging any conflicts automatically.

The Real-time Database provides a flexible, expression-based rules language, called Firebase Real-time Database Security Rules, to define how your data should be structured and when data can be read from or written to. When integrated with Firebase Authentication, developers can define who has access to what data, and how they can access it.

2.7.4 Firebase As Authentication:

Most apps need to know the identity of a user. Knowing a user's identity allows an app to securely save user data in the cloud and provide the same personalized experience across all of the user's devices. Firebase Authentication provides backend services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to your app. It supports authentication using passwords, phone numbers, popular federated identity providers like Google, Face book and Twitter, and more.

Firebase Authentication integrates tightly with other Firebase services, and it leverages industry standards like OAuth 2.0 and OpenID Connect, so it can be easily integrated with your custom backend.

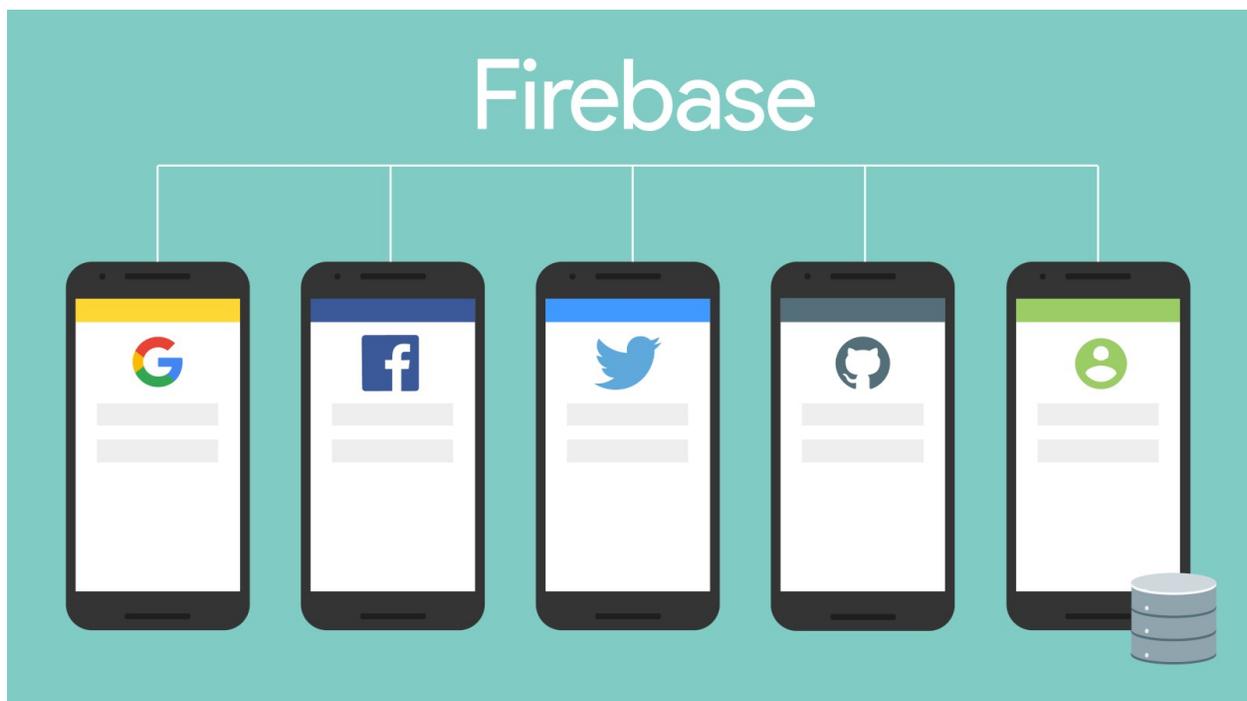


Figure 2.7.3 Firebase Authorization Providers.

Key Capabilities:

2.7.4.1 Email Based Authentication:

Authenticate users with their email addresses and passwords. The Firebase Authentication SDK provides methods to create and manage users that use their email addresses and passwords to sign in. Firebase Authentication also handles sending password reset emails.

How does it work?

To sign a user into your app, you first get authentication credentials from the user. These credentials can be the user's email address and password, or an OAuth token from a federated identity provider. Then, you pass these credentials to the Firebase Authentication SDK. Our backend services will then verify those credentials and return a response to the client. After a successful sign in, you can access the user's basic profile information, and you can control the user's access to data stored in other Firebase products. You can also use the provided authentication token to verify the identity of users in your own backend services.

2.7.4.2 Phone Number Based Authentication:

You can use Firebase Authentication to sign in a user by sending an SMS message to the user's phone. The user sign in using a one-time code contained in the SMS message. The easiest way to add phone number sign-in to your app is to use Firebase, which includes a drop-in sign-in widget that implements sign-in flows for phone number sign-in, as well as password-based and federated sign-in. This document describes how to implement a phone number sign-in flow using the Firebase SDK.

MODULES

3. MODULES

3.1 User Module:

When any user buys our product, we provide hardware kit and an application. User has to install our hardware at his premises. To check the status of the device user can use our mobile application. Here user has to register with the email and password. After registering, user can enter tank details like height and capacity to check the status.

This status will be updated automatically. If any user wants to check multiple devices status then he/she has to enter new device id. Because our system provides a unique device id for every hardware kit. With that device Id user can check status of multiple devices. In the application we're displaying Ph value, Turbidity value and the level of water contained in tank.

3.2 Admin Module:

Admin is responsible for entire system. Admin will store the credentials provided by user, data sent by the hardware kit and data to be transferred to App for monitoring. Admin stores the data in separate fields which are sent by the hardware kit. It also provides credentials like unique id to device and with that other devices may be differed.

When the application requests the admin for the sensor data then by providing read API the data is fetched. And it verifies the user credentials while logging in. when user enters other device id then it stores in the user's database which already contains email and other data. It provides user to access multiple devices status. If any user requests to check the status then it verifies the device id to send the result.

3.3 Hardware Kit:

Hardware kit consists of the following components.

Turbidity sensor, pH sensor, ultrasonic sensor, Arduino and NodeMCU. All the sensors are connected to Arduino. pH sensor gives the pH value of water, ultrasonic sensor value is used to calculate remaining water. Turbidity sensors return the total dissolved present in water. And all these data are processed by Arduino which is a microcontroller. NodeMCU is used as WIFI module for Arduino. NodeMCU use a valid internet connection. And by using the server write API key the sensor data is posted. User must provide internet connection to hardware kit to process the task. The pH sensor values vary from 0 to 14. When user request the status then admin calls the hardware to return the reports. At that point of time, kit returns the sensor value to user.

3.4. Application Module:

Application is another feature provided to user for checking the status of the system. Application contains registration phase where user must register before using the application. After registration, if user wants to check the status, then application asks tank height and capacity. Then these values are posted to server for calculating remaining water and after processing them it returns the remaining water with the help of admin. And it also displays pH value, Turbidity value.

Application checks the pH value returned from kit by admin and checks whether it is pure or not by using condition like pH value is equal to seven then show water is ready to use. And also sets other conditions to show multiple warnings to intimate the user whether the water is ready to use or not. And application provides user to add devices when logged in. Logout option is provided to logout the account when users don't want to use the application.

DESIGN

4. DESIGN

4.1. System Design:

The Systems Development Life Cycle (SDLC), or Software Development Life Cycle in systems engineering, information systems and software engineering, is the process of creating or altering systems, and the models and methodologies that people use to develop these systems. In software engineering the SDLC concept underpins many kinds of software development methodologies. These methodologies form the framework for planning and controlling the creation of an information system.

4.2. Process Modules with Justification:

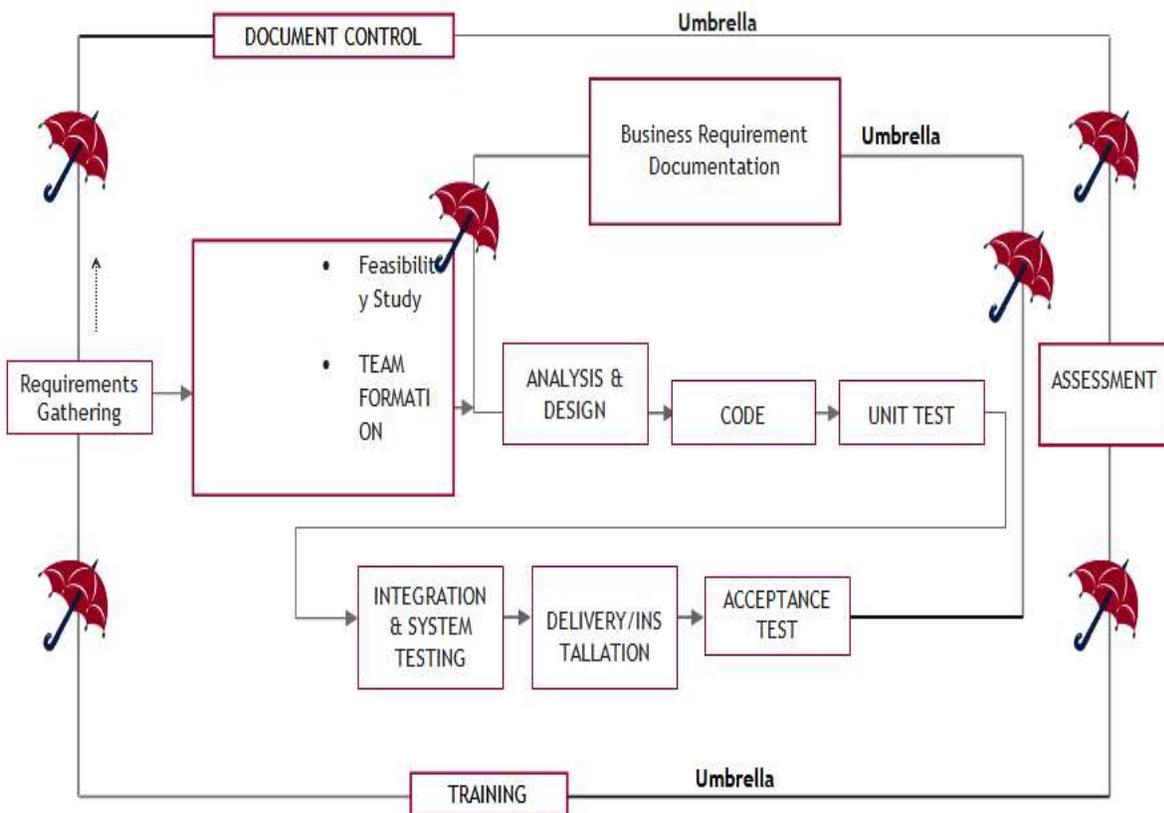


Figure 4.2.1 Umbrella Model.

4.3 UML Diagrams:

The Unified Modeling Language allows the software engineer to express an analysis model using the modeling notation that is governed by a set of syntactic semantic and pragmatic rules. A UML system is represented using five different views that describe the system from distinctly different perspective. Each view is defined by a set of diagram, which is as follows.

4.3.1 Relationships In The UML Diagrams:

There are four kinds of relationships in the UML:

- Dependency
- Association
- Generalization
- Realization

A **dependency** is a semantic relationship between two things in which a change to one thing may affect the semantics of the other thing (the dependent thing).



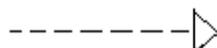
An **association** is a structural relationship that describes a set links, a link being a connection among objects. Aggregation is a special kind of association, representing a structural relationship between a whole and its parts.



A **generalization** is a specialization/ generalization relationship in which objects of the specialized element (the child) are substitutable for objects of the generalized element (the parent).



A **realization** is a semantic relationship between classifiers, where in one classifier specifies a contract that another classifier guarantees to carry out.



4.4 Class Diagram:

In software engineering, a class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes. It explains which class contains information.

The class diagram is the main building block of object oriented modeling. It is used both for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. Class diagrams can also be used for data modeling. The classes in a class diagram represent both the main objects, interactions in the application and the classes to be programmed.

A class with three sections, in the diagram, classes is represented with boxes which contain three parts:

1. The upper part holds the name of the class
2. The middle part contains the attributes of the class
3. The bottom part gives the methods or operations of the class.

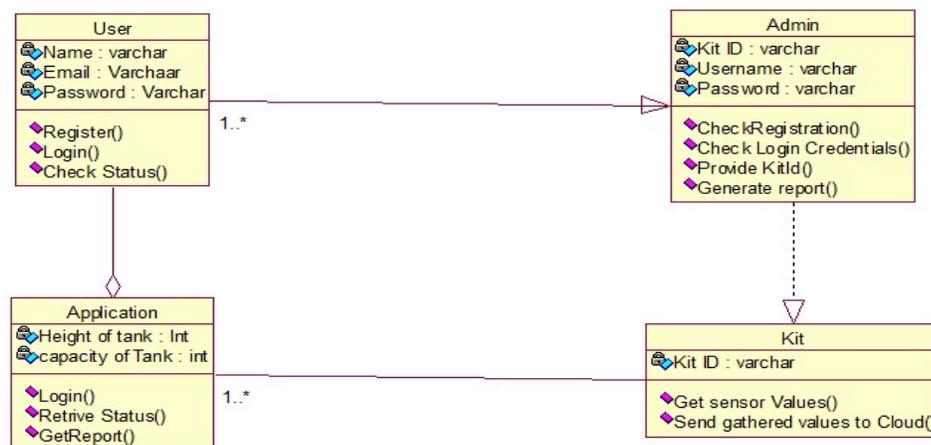


Figure 4.4.1 Class Diagram.

4.5 Sequence Diagram:

Sequence diagram in a UML is a kind of interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object and classes involvement in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. These diagrams are associated with use case realizations in the **Logical view** of the system under development. Sequence diagrams are sometimes called event diagrams, event scenarios and timing diagrams.

A sequence diagram shows, as parallel vertical lines (lifelines), different processes or objects that live simultaneously, and, as horizontal arrows, the messages exchanged between them, in the order in which they occur. This allows the specification of simple runtime scenarios in a graphical manner. If the lifeline is that of an object, it demonstrates a role. Leaving the instance name blank can represent anonymous and unnamed instances.

4.5.1 Primitive Symbols:

An object participating in the interaction is shown at the top of the chart as boxes attached to a vertical dashed line. Inside the box the name of the object is written with a colon separating it from the name of the class and both the name of the object and the class is underlined. The object appearing at top signify that the objects already existed when the use case executed are initiated.

4.5.2 Object's Lifeline:

The vertical dashed line is called the object's lifeline. The lifeline indicates the existence of the object at any particular point of time.

The rectangular drawn on the lifeline is called the activation symbol and indicates that the object is active as long as the rectangle exists.

Each message indicates as an arrow between the lifelines of two objects. The messages are shown in chronological order from the top to the bottom.

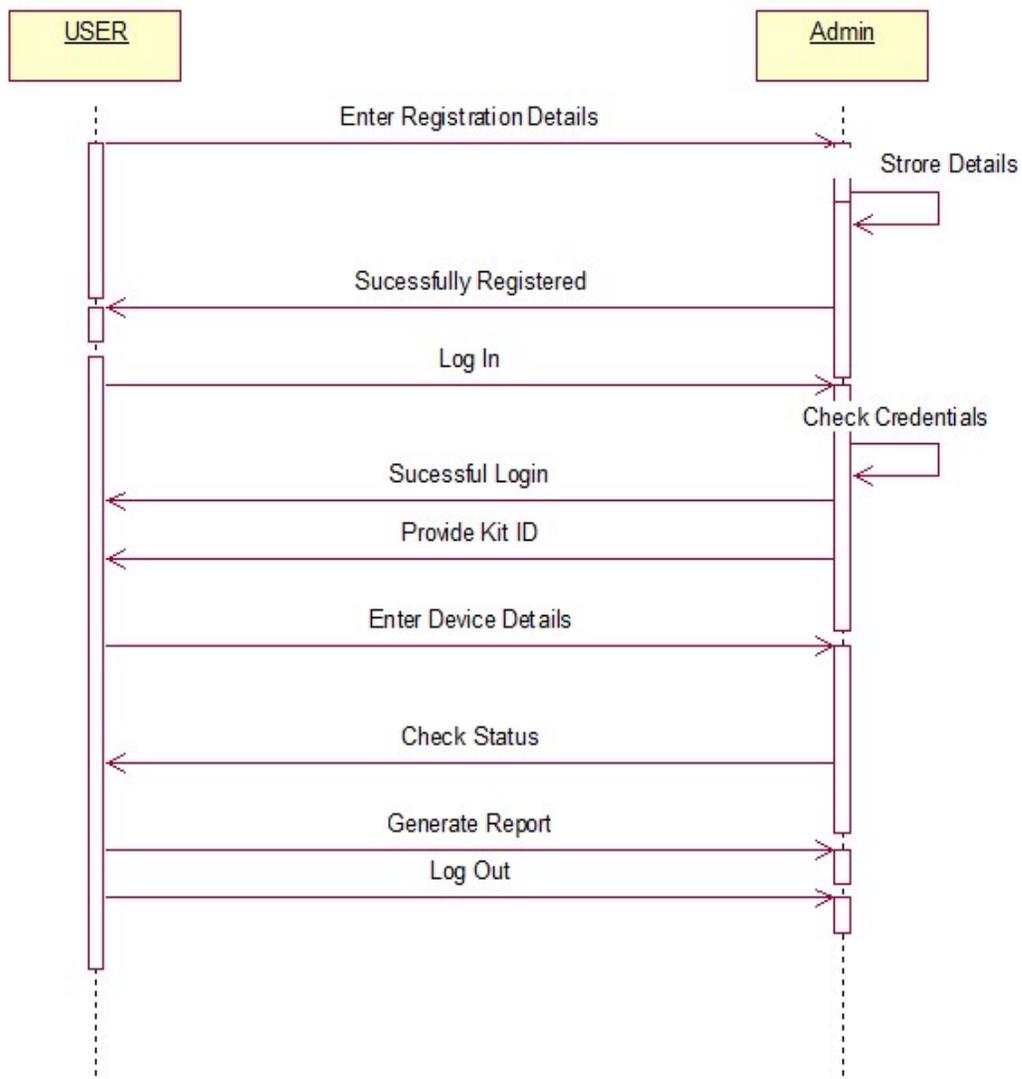


Figure 4.5.1 Sequence Diagram.

4.6 Deployment Diagram:

Deployment diagram is a structure diagram which shows architecture of the system as deployment (distribution) of software artifacts to deployment targets. Artifacts represent concrete elements in the physical world that are the result of a development process.

Deployment diagrams are used to visualize the topology of the physical components of a system, where the software components are deployed. Deployment diagrams are used to describe the static deployment view of a system. Deployment diagrams consist of nodes and their relationships.

Most of the UML diagrams are used to handle logical components but deployment diagrams are made to focus on the hardware topology of a system. Deployment diagrams are used by the system engineers.

The purpose of deployment diagrams can be described as:

- Visualize the hardware topology of a system.
- Describe the hardware components used to deploy software components.
- Describe the runtime processing nodes.

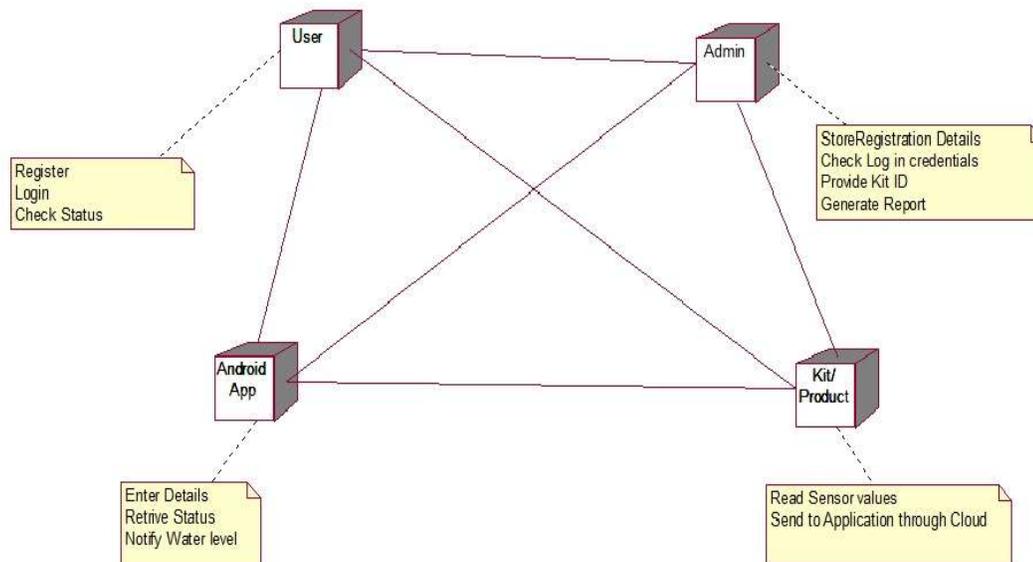


Figure 4.6.1 Deployment Diagram.

4.7 Component Diagram:

Component diagrams are different in terms of nature and behavior. Component diagrams are used to model the physical aspects of a system. Now the question is, what are these physical aspects? Physical aspects are the elements such as executables, libraries, files, documents, etc. which reside in a node.

Component diagrams are used to visualize the organization and relationships among components in a system. These diagrams are also used to make executable systems.

A single component diagram cannot represent the entire system but a collection of diagrams is used to represent the whole.

The purpose of the component diagram can be summarized as –

- Visualize the components of a system.
- Construct executables by using forward and reverse engineering.
- Describe the organization and relationships of the components.

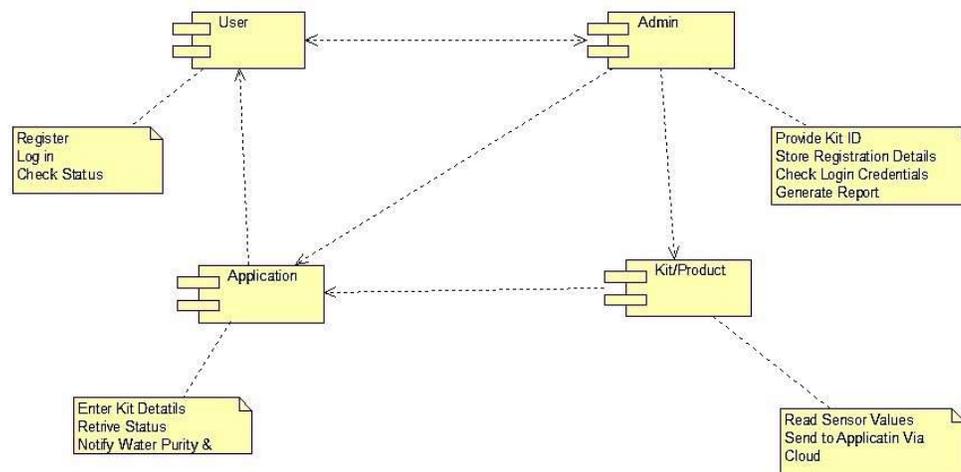


Figure 4.7.1 Component Diagram.

4.8 Use Case Diagram:

Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable result to the actors or other stakeholders of the system.

A **use case diagram** is the representation of a user's interaction with the system that shows the relationship between the user and different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and different use cases and will often be accompanied by other types of diagrams as well.

While a use case itself might drill into a lot of detail about every possibility, a use-case diagram can help provide a higher-level view of the system. It has been said before that “use case diagrams are the blueprints for the system”. They provide the simplified and graphical representation of that system must actually do.

A **use case diagram** at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. This type of diagram is typically used in conjunction with the textual use case and will often be accompanied by other types of diagrams as well.

So in brief, the purposes of use case diagrams can be as follows:

- ❖ Used to gather requirements of a system.
- ❖ Used to get an outside view of a system.
- ❖ Identify external and internal factors influencing the system.
- ❖ Show the interacting among the requirements are actors.

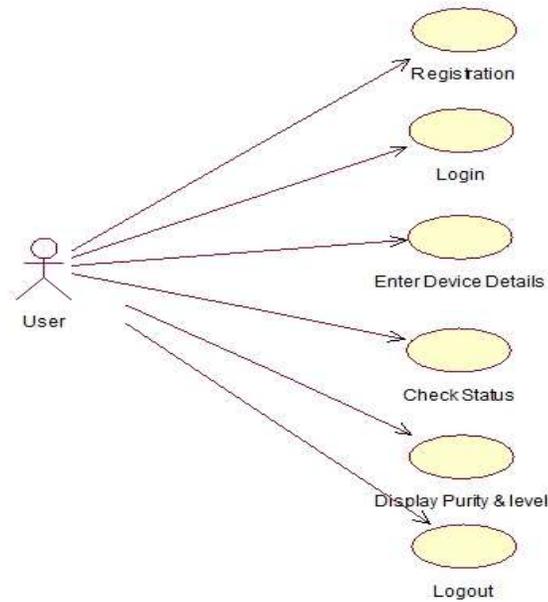


Figure 4.8.1 Use Case Diagram for User.

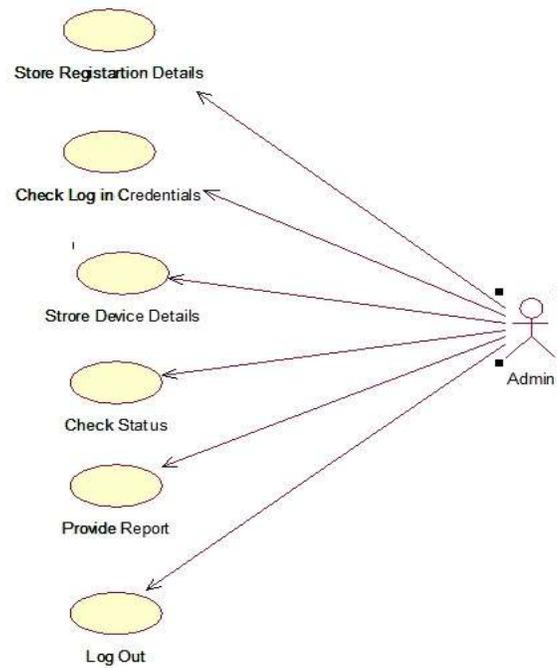


Figure 4.8.2 Use case Diagram for Admin.

IMPLEMENTATION

5. Implementation

5.1 Hardware Connections:

5.1.1 pH sensor

The pH Meter is a scientific instrument that measures the hydrogen-ion concentration in water-based solutions, indicating its acidity or alkalinity expressed as pH. The pH meter measures the distinction in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potential metric pH meter". The difference in electrical potential relates to pH of the solution. The pH meter is employed in several applications starting from laboratory experimentation to internal quality control. The pH scale is a logarithmic scale whose range is from 0-14 with a neutral point being 7. Values above 7 indicate a basic or alkaline solution and values below 7 would indicate an acidic solution. It operates on 5V power supply and it is easy to interface with arduino. The normal range of pH is 6 to 8.5.

Connections:

Black -GND

Red -AO

Yellow -5v



Figure 5.1.1 pH Sensor

5.1.2 Turbidity sensor

Turbidity is the quantitative measure of the cloudiness of water and suspended particles in a fluid. Turbidity has indicated the degree at which the water loses its transparency. It is considered as a good measure of the quality of water. Turbidity blocks out the light needed by submerged aquatic vegetation. It also can raise surface water temperatures above normal because suspended particles near the surface facilitate the absorption of heat from sunlight. It can be soil in water or chocolate flakes in your favorite milk shake. While chocolate is something we so want in our drinks, soil particles are totally undesired. Turbidity Sensor along with a micro controller unit takes care of turbidity measurements. Crafted with plastic and some metal-alloy traces, turbidity sensor uses light to convey data concerning turbidity in water. The turbidity sensor appears like an Android bot. Two horn like structure, a top to bottom mono material body. A black color cap is placed at the bottom of the sensor. Thick alloyed contact legs provide ways for connectors to hold to the sensor. A white plastic slab protects the legs from damage. The plastic used to make outer structure can survive high temperature variations as well as mechanical corrossions. Scales are found on the transparent can which enable easy gripping. Between the “horns”, a bulge can is seen that holds the thermostat and provides temperature sensing ability to the sensor.

Connections:

GND-GND

VCC-5V

OUT-AO



Figure 5.1.2 Turbidity Sensor

5.1.3 Ultrasonic sensor:

Knowing the amount of water in an overhead tank can be one tedious task. Usually, you'll end up climbing up the stairs to the tank and checking the level manually or you'll hear the water overflowing from the top. But these days electronic water level indicators are available to fix this problem, but they often come with a hefty price tag and are usually difficult to install. Most of the available systems use dipped electrodes or float switches, which can be a headache in the long run. Wireless Water Level Indicator Using Ultrasonic sensor & Arduino is an amazing and very useful project. The objective of this project is to notify the user the amount of water that is present in the overhead water tank. This project can be further enhanced to control the water level in the tank by turning it ON, when the water level is LOW, and turning it OFF when the water level is HIGH. Thus, the Arduino water level indicator helps in preventing wastage of water in overhead tank. This project is wireless so, it is easy to install and it can work up to 100 meters. In this project two circuits are used: a transmitter circuit and a receiver circuit. The transmitter circuit makes use of an ultrasonic sensor to measure the water level in terms of distance. We present a different approach to knowing the water level using an Ultrasonic module with Arduino. The advantage of this method is that it is contactless, so issues like corrosion of the electrodes won't affect this system. Furthermore, this Arduino water level indicator it is much easier to install than regular systems.

Connections:

Ultra-NodeMCU

VCC- Vin

Gnd –Gnd

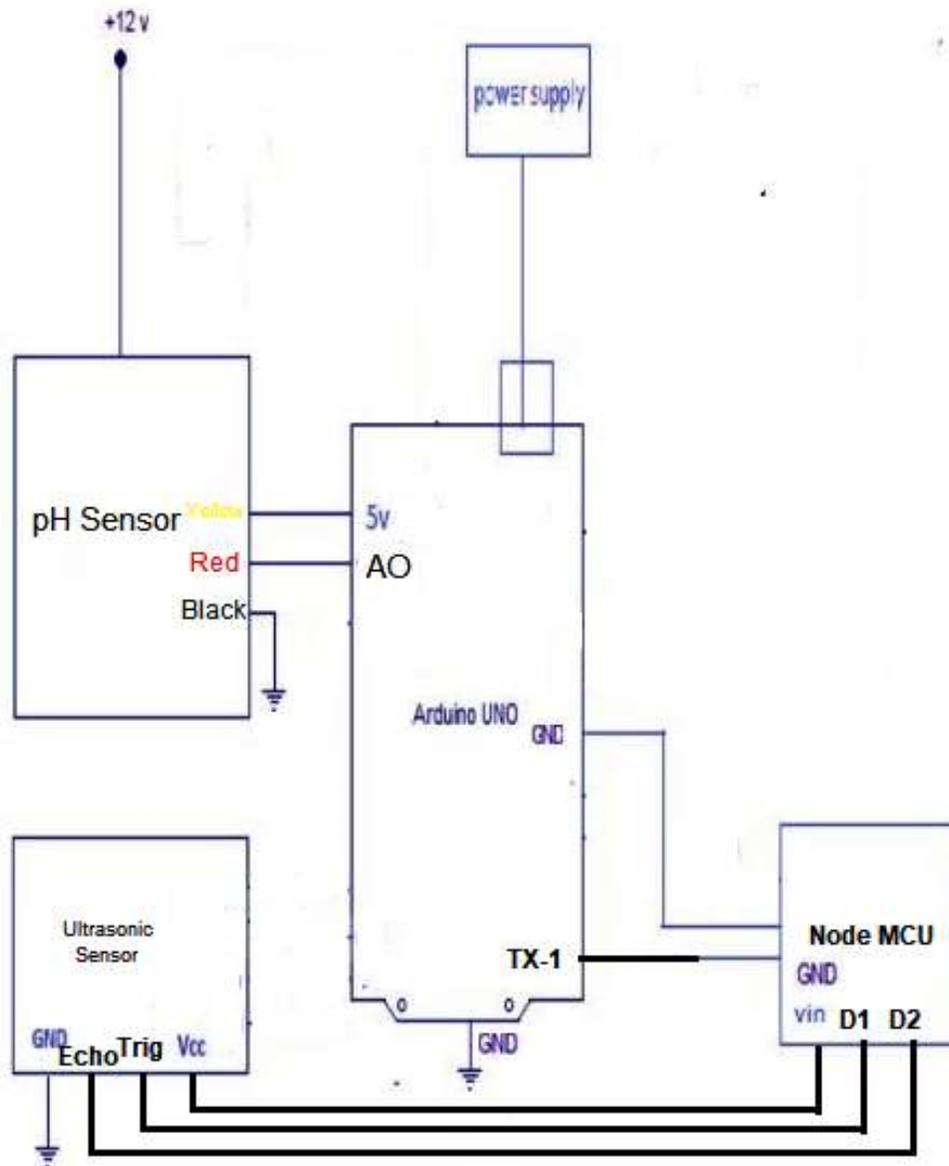
Echo –D1

Trig- D2



Figure 5.1.3 Ultrasonic Sensor

5.1.4 Schematic Diagram



5.1.4 Schematic Diagram

5.2 Process Diagram

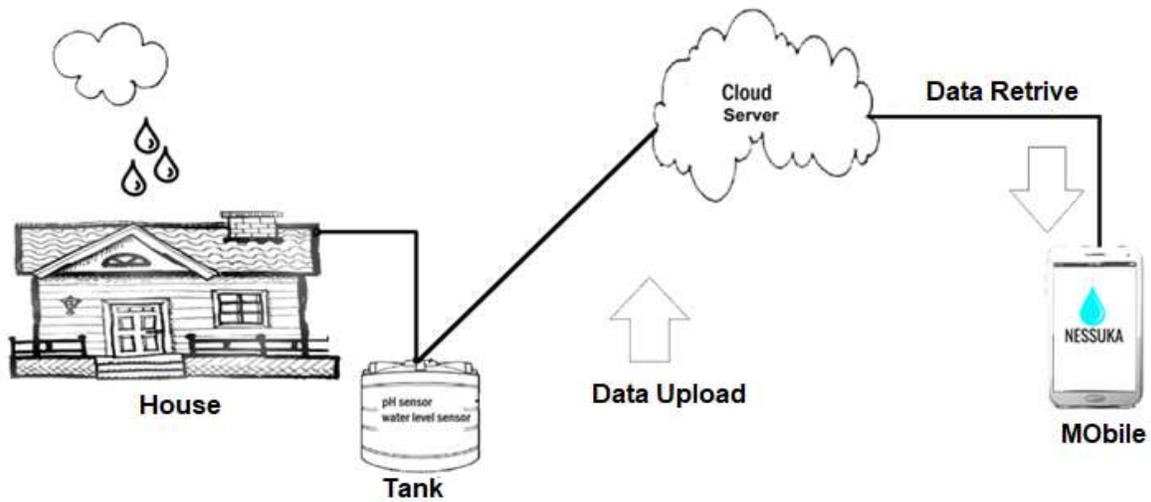


Figure 5.2.1 Process Diagram.

5.2.1 Test Connections:

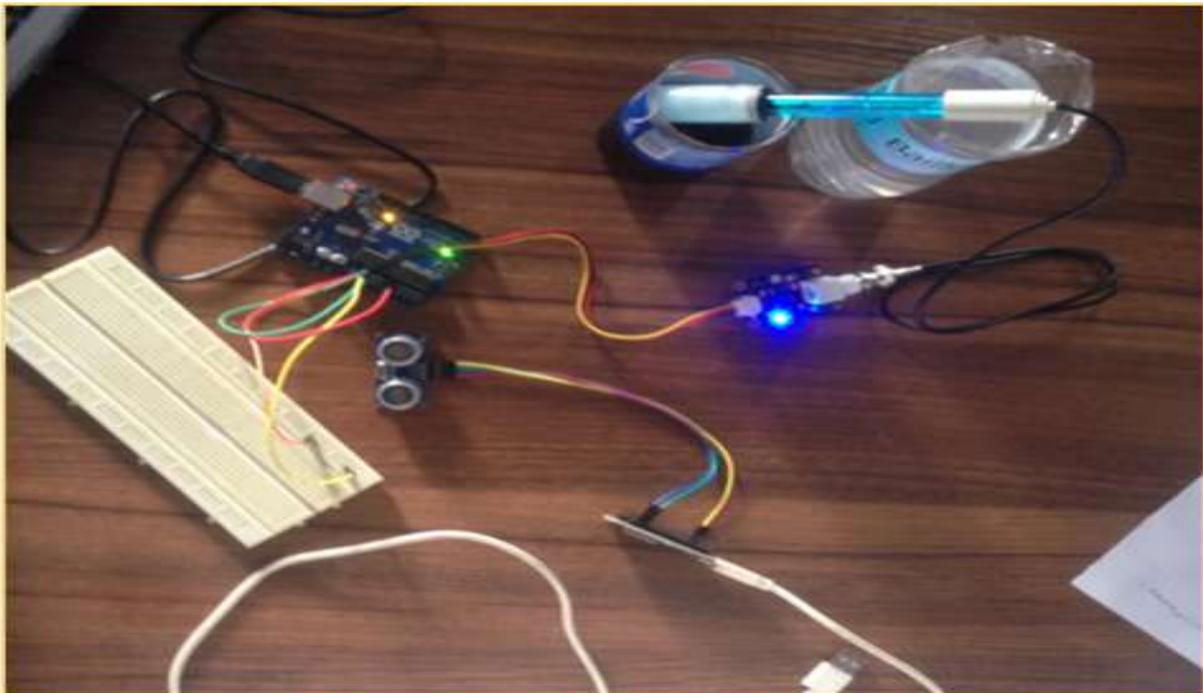


Figure 5.2.2 Test Connections

5.3 Coding in Arduino IDE:

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. It runs on Windows, Mac OS X, and Linux. This software can be used with any Arduino board. The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them. Programs written using Arduino Software (IDE) are called sketches. These sketches are written in the text editor and are saved with the file extension .ino. The editor has features for cutting/pasting and for searching/replacing text. The message area gives feedback while saving and exporting and also displays errors. The console displays text output by the Arduino Software (IDE), including complete error messages and other information. The bottom righthand corner of the window displays the configured board and serial port. The toolbar buttons allow you to verify and upload programs, create, open, and save sketches, and open the serial monitor

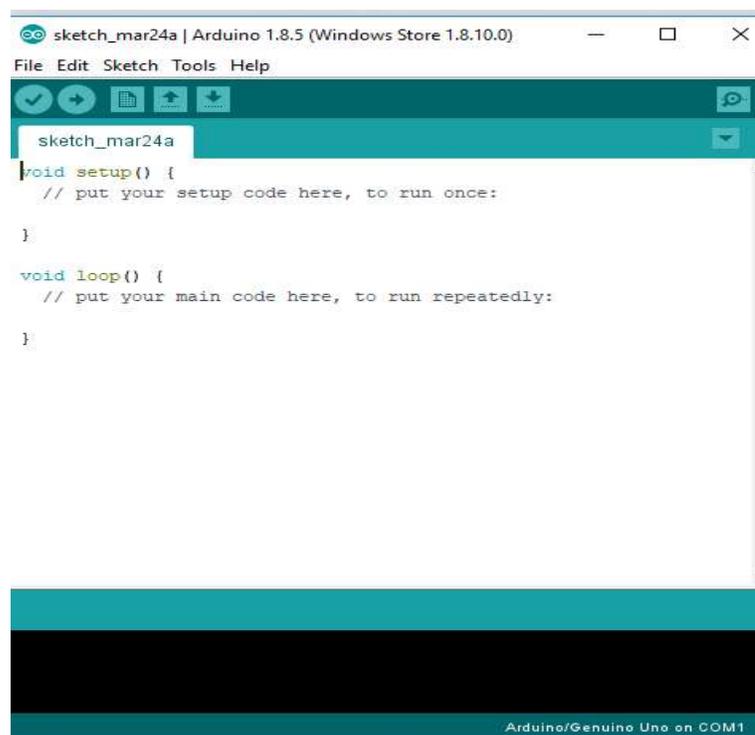


Figure 5.3.1 Arduino IDE

5.3.1 Steps to operate Arduino Software:

1. Open Arduino IDE

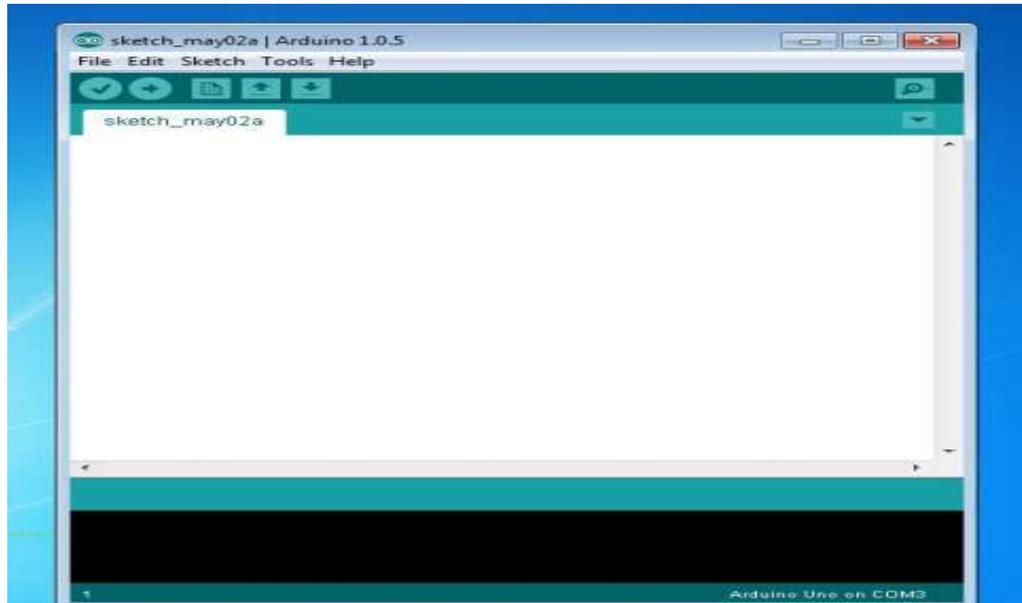


Figure 4

Figure 5.3.2 Screen After Opening Arduino IDE

2. Write the program in the editor space.

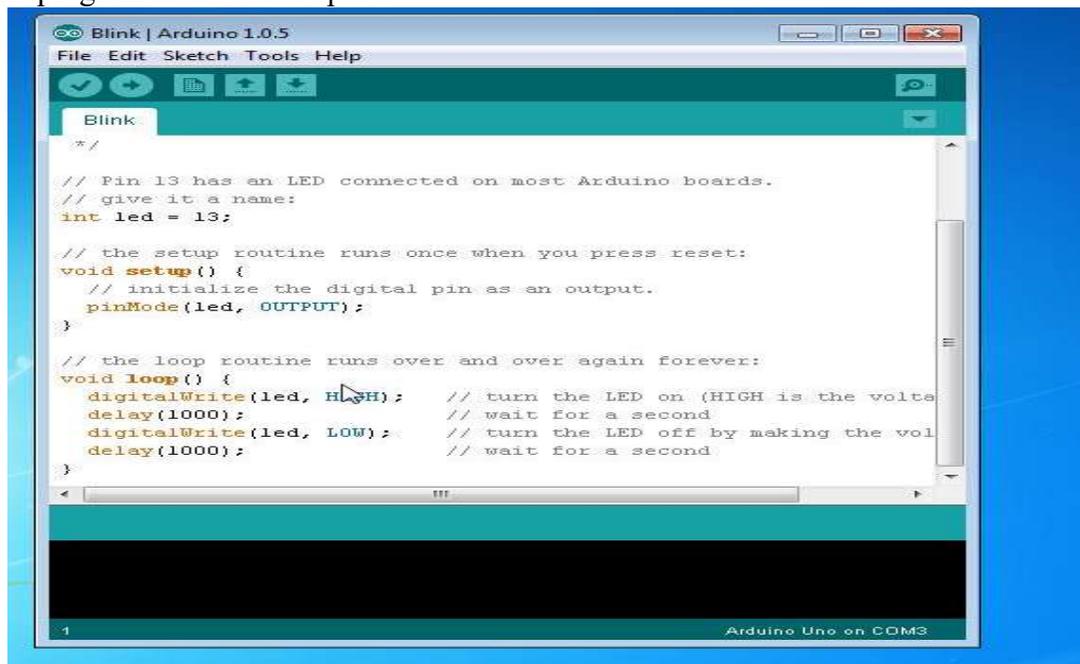


Figure 5.3.3 Screen After Writing The program

3. Before compiling the program go to tools  board  select Arduino/genuine Uno.

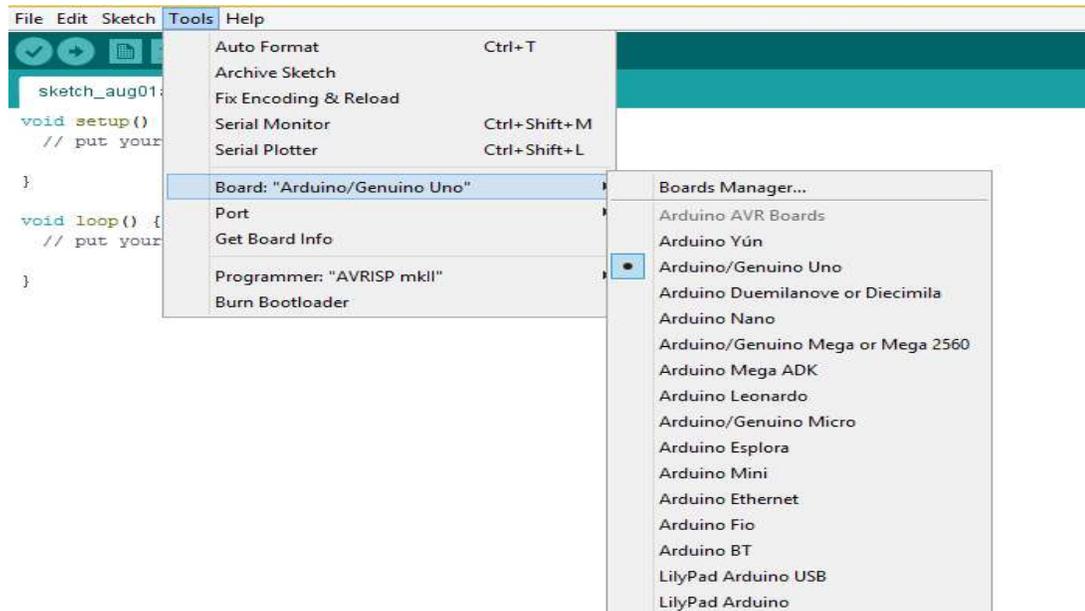


Figure 5.3.4 Screen For Selection Of Board Before Compiling

4. Compile the program to know whether there are any errors in the program.

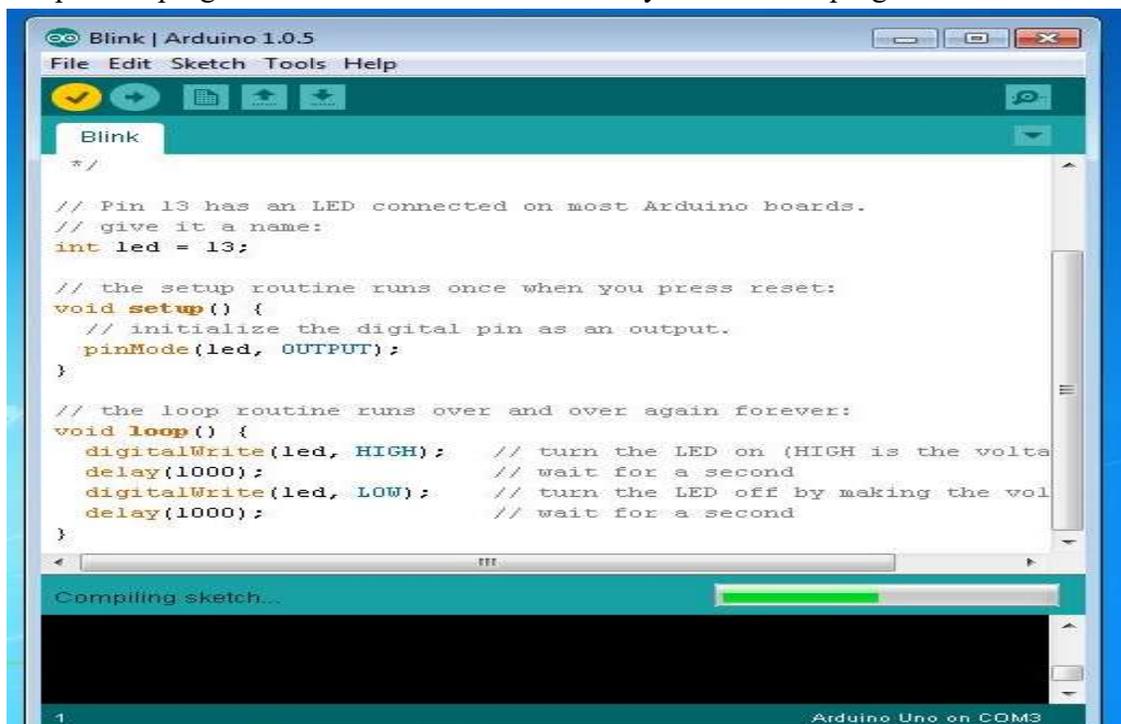


Figure 5.3.5 Screen While Compiling Sketch

5. Upload the program on to the Arduino board to run the application.

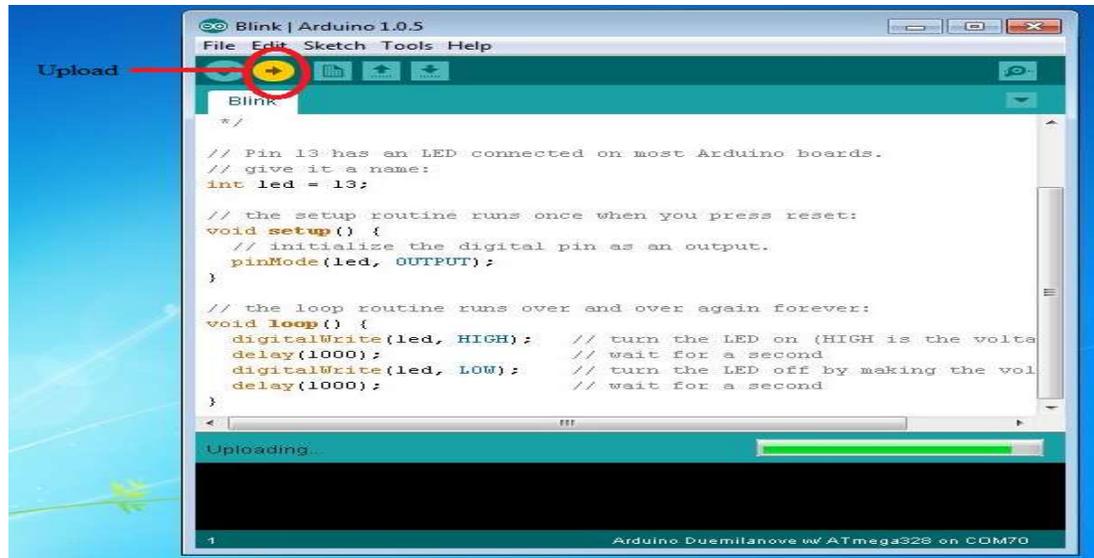


Figure 5.3.6 Screen While Uploading Program To The Arduino Board

5.3.2 Tool Bar Buttons:

1. VERIFY: Checks your code for errors compiling it.



SYMBOL:

2. UPLOAD: Compiles your code and uploads it to the configured board.



SYMBOL:

3. NEW: Creates a new sketch.



SYMBOL:

4. OPEN: Presents a menu of all the sketches in your sketchbook. Clicking one will open it within the current window overwriting its content.



SYMBOL:

5. SAVE: Saves the sketch.



SYMBOL:

5.3.3 Menu Bar:

Additional commands are found within the five menus: File, Edit, Sketch, Tools, Help. The menus are context sensitive, which means only those items relevant to the work currently being carried out are available.

5.4 Thing Speak:

According to its developers, "Thing Speak ^[23] is an open source Internet of Things (IoT) application and API to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. Thing Speak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates".

Thing Speak was originally launched by ioBridge in 2010 as a service in support of IoT applications

Thing Speak has integrated support from the numerical computing software MATLAB from Math Works. Allowing Thing Speak users to analyze and visualize uploaded data using Mat lab without requiring the purchase of a Mat lab license from Math works.

Thing Speak has a close relationship with Math works, Inc. In fact, all of the Thing Speak documentation is incorporated into the Math works' Mat lab documentation site and even enabling registered Math works user accounts as valid login credentials on the Thing Speak website. The terms of service and privacy policy of ThingSpeak.com are between the agreeing user and Math works, Inc.

CODING

6. CODING

6.1 Android Code:

6.1.1 Signup

6.1.1.1 Signup. Java

```
package com.hackathon.firebase.firebasedemo;
import android.app.ProgressDialog;
import android.content.Intent;
import android.os.Bundle;
import android.support.annotation.NonNull;
import android.support.v7.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity implements View.OnClickListener{
    private Button Register;
    private EditText edemail,edpassword;
    private TextView login;
    private ProgressDialog progressDialog;
    private FirebaseAuth firebaseAuth;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Register=(Button) findViewById(R.id.register);
        edemail=(EditText) findViewById(R.id.emailed);
        edpassword=(EditText) findViewById(R.id.passed);
        login=(TextView) findViewById(R.id.logintext);
        Register.setOnClickListener(this);
        login.setOnClickListener(this);
        progressDialog=new ProgressDialog(this);
        firebaseAuth=FirebaseAuth.getInstance();
        if(firebaseAuth.getCurrentUser()!=null){
            finish();
            startActivity(new Intent(MainActivity.this,ProfileActivity.class));
        }
    }

    @Override
    public void onClick(View view) {
```

```
        if(view==Register){
            registerUser();
        }
        if(view==login)
        {
            //will open login activity
            startActivity(new Intent(this,LoginActivity.class));
        }
    }

    private void registerUser() {
        String email=edemail.getText().toString().trim();
        String pass=edpassword.getText().toString().trim();
        if(TextUtils.isEmpty(email)){
            Toast.makeText(getApplicationContext(),"please enter
email",Toast.LENGTH_LONG).show();
            return;
        }
        if(TextUtils.isEmpty(pass)){
            Toast.makeText(getApplicationContext(),"Enter
password",Toast.LENGTH_LONG).show();
            return;
        }
        if(!Patterns.EMAIL_ADDRESS.matcher(email).matches()){
            Toast.makeText(getApplicationContext(),"Please Enter valid email
addresss",Toast.LENGTH_LONG).show();
        }
        progressDialog.setMessage("Registering user.....");
        progressDialog.show();

        firebaseAuth.createUserWithEmailAndPassword(email,pass).addOnCompleteListener(this,
new OnCompleteListener<AuthResult>() {
            @Override
            public void onComplete(@NonNull Task<AuthResult> task) {

                if(task.isSuccessful()){
                    progressDialog.hide();
                }
            }
        });
    }
}
```

```
                Toast.makeText (MainActivity.this, "Successfully
Registered", Toast.LENGTH_SHORT) .show ();
            }else{
                Toast.makeText (MainActivity.this, "Could not be
registered", Toast.LENGTH_SHORT) .show ();
            }
        }
    });
}
}
```

6.1.1.2 Signup. Xml

```
<?xml version="1.0" encoding="utf-8" ?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.hackathon.firebase.firebasedemo.MainActivity">
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_alignParentTop="true"
        android:layout_marginTop="131dp"
        android:id="@+id/emailed"
        android:inputType="textEmailAddress"
        android:hint="Enter Email address"
        android:textColorHint="#000000"
        android:textAlignment="center"
    />
    <EditText
        android:id="@+id/passed"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
```

```
        android:layout_below="@+id/emailed"
        android:hint="Enter Password(alphanumeric)"
        android:inputType="textPassword"
        android:textAlignment="center"
        android:textColorHint="#000000" />
    <Button
        android:id="@+id/register"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/passed"
        android:layout_marginTop="22dp"
        android:background="#09bc9f"
        android:text="Register" />
    <TextView
        android:id="@+id/logintext"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/register"
        android:layout_marginTop="17dp"
        android:text="Already Registered? try login"
        android:textAlignment="center"
        android:textColor="#09bc9f"
        android:textStyle="bold"/>
</RelativeLayout>
```

6.1.2 Login:

6.1.2.1 Login.Java

```
package com.hackathon.firebase.firbasedemo;
import android.app.ProgressDialog;
import android.content.Intent;
import android.os.Bundle;
import android.support.annotation.NonNull;
import android.support.v7.app.AppCompatActivity;
public class LoginActivity extends AppCompatActivity implements View.OnClickListener {
```

```

private EditText edemail,edpassword;
private Button login;
private TextView textsign;
private FirebaseAuth firebaseAuth;
ProgressDialog progressDialog;
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_login);
    edemail=(EditText) findViewById(R.id.logem);
    edpassword=(EditText) findViewById(R.id.logpass);
    login=(Button) findViewById(R.id.logbut);
    textsign=(TextView) findViewById(R.id.textsign);
    login.setOnClickListener(this);
    textsign.setOnClickListener(this);
    progressDialog=new ProgressDialog(this);
    firebaseAuth=FirebaseAuth.getInstance();
    if(firebaseAuth.getCurrentUser()!=null){
        finish();
        startActivity(new Intent(LoginActivity.this,ProfileActivity.class));
    }
}
@Override

public void onClick(View view) {
    if(view==login) {
        userLogin();
    }
    if(view==textsign){
        startActivity(new Intent(this,MainActivity.class));
    }
}

private void userLogin() {
    String email=edemail.getText().toString().trim();
    String pass=edpassword.getText().toString().trim();
    if(TextUtils.isEmpty(email)){
        Toast.makeText(getApplicationContext(),"please enter
email",Toast.LENGTH_LONG).show();

```

```

        return;
    }
    if(TextUtils.isEmpty(pass)){
        Toast.makeText(getApplicationContext(),"Enter
password",Toast.LENGTH_LONG).show();
        return;
    }
    if(!Patterns.EMAIL_ADDRESS.matcher(email).matches()){
        Toast.makeText(getApplicationContext(),"Please Enter valid email
addresss",Toast.LENGTH_LONG).show();
    }
    progressDialog.setMessage("Logging user.....");
    progressDialog.show();
    firebaseAuth.signInWithEmailAndPassword(email,pass).addOnCompleteListener(new
OnCompleteListener<AuthResult>() {
        @Override
        public void onComplete(@NonNull Task<AuthResult> task) {
            if(task.isSuccessful()){
                progressDialog.hide();
                finish();
                startActivity(new
Intent(LoginActivity.this,ProfileActivity.class));
            }else{
                Toast.makeText(LoginActivity.this, "Could not login",
Toast.LENGTH_SHORT).show();
            }
        }
    });
}
}

```

6.1.2.2 Login. Xml

```

<?xml version="1.0" encoding="utf-8" ?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.hackathon.firebase.firebasedemo.LoginActivity">

```

```
<EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    android:layout_alignParentTop="true"
    android:layout_marginTop="120dp"
    android:id="@+id/logem"
    android:inputType="textEmailAddress"
    android:hint="Enter Email"
    android:textColorHint="#000000"
    android:textAlignment="center"/>

<EditText
    android:id="@+id/logpass"
    android:inputType="textPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    android:layout_below="@+id/logem"
    android:layout_marginTop="22dp"
    android:hint="Enter Password(alphanumeric)"
    android:textAlignment="center"
    android:textColorHint="#000000" />

<Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:layout_below="@+id/logpass"
    android:layout_marginTop="13dp"
    android:id="@+id/logbut"
    android:background="#09bc9f"
    android:text="Login"
    android:textAlignment="center"/>

<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
```

```
    android:layout_below="@+id/logbut"
    android:layout_marginTop="11dp"
    android:id="@+id/textsign"
    android:text="Didn't Registered? Register Here"
    android:textAlignment="center"
    android:textColor="#09bc9f"
    android:textStyle="bold"/>
```

```
</RelativeLayout>
```

6.1.3 Dashboard:

6.1.3.1 Status. Java

```
package com.hackathon.firebase.firebasedemo;
import android.content.Intent;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
public class StatusActivity extends AppCompatActivity implements View.OnClickListener {
    EditText Name,Mobile,Device,Location;
    TextView click,back;
    DatabaseReference databaseReference;
    FirebaseUser firebaseUser;
    FirebaseDatabase firebaseDatabase;
    FirebaseAuth firebaseAuth;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_status);
        Name=(EditText)findViewById(R.id.Name);
        Location=(EditText)findViewById(R.id.Location);
        Device=(EditText)findViewById(R.id.Device);
        Mobile=(EditText)findViewById(R.id.Mobile);
        click=(TextView)findViewById(R.id.textView);
        click.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        if(view==click){
            Checkdetails();
        }
    }
}
```

```

}
private void Checkdetails() {
    Toast.makeText(this, "OK", Toast.LENGTH_SHORT).show();
    String N,L,M,D;
    N=Name.getText().toString().trim();
    M=Mobile.getText().toString().trim();
    D=Device.getText().toString().trim();
    L=Location.getText().toString().trim();
    if(N.isEmpty()){
        Name.setError("Height Mandatory");
    }
    if(M.isEmpty()){
        Mobile.setError("Capacity Mandatory");
    }
    if(D.isEmpty()){
        Device.setError("Enter Device ID");
    }
    if(L.isEmpty()){
        Location.setError("Location Mandatory");
    }
    AddDevice addDevice=new AddDevice(N,M,D,L);
    FirebaseUser user=firebaseAuth.getCurrentUser();
    databaseReference.child(user.getUid()).setValue(addDevice);
    startActivity(new Intent(getApplicationContext(),ProfileActivity.class));
    Toast.makeText(getApplicationContext(),"Data Saved Successfully",Toast.LENGTH_LONG).show();
}
}

```

6.1.3.2 Status. Xml:

```

<?xml version="1.0" encoding="utf-8" ?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.hackathon.firebase.firebasedemo.StatusActivity"
    android:background="@drawable/nessuka" >

    <EditText
        android:id="@+id/Device"

```

```
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_marginTop="13dp"
android:hint="Enter Device ID"
android:inputType="number"
android:textAlignment="center"
android:textColor="#000000"
android:textColorHint="#000000" />
```

<EditText

```
android:id="@+id/Mobile"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_above="@+id/Location"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_marginBottom="18dp"
android:hint="Enter Your Mobile"
android:inputType="number"
android:textAlignment="center"
android:textColor="#000000"
android:textColorHint="#000000" />
```

<EditText

```
android:id="@+id/Location"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_above="@+id/textView"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_marginBottom="18dp"
android:hint="Enter Device Location"
android:inputType="number"
android:textAlignment="center"
android:textColor="#000000"
android:textColorHint="#000000" />
```

<EditText

```
android:id="@+id/Name"
android:layout_width="match_parent"
android:layout_height="wrap_content"
```

```
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/Device"
        android:layout_marginTop="26dp"
        android:hint="Enter Your Name"
        android:inputType="text"
        android:textAlignment="center"
        android:textColor="#000000"
        android:textColorHint="#000000" />
<TextView
    android:id="@+id/textView"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    android:layout_marginBottom="207dp"
    android:text="Click Here to Save"
    android:textAlignment="center"
    android:textColor="#000000"
    android:textSize="12pt" />
</RelativeLayout>
```

6.2 Arduino Uno IDE Code:

```
/*
# This sample code is used to test the pH meter V1.0.
# Editor : YouYou
# Ver : 1.0
# Product: analog pH meter
# SKU : SEN0161
*/
int data;
#define SensorPin A0 //pH meter Analog output to Arduino Analog Input 0
#define Offset 2.15 //deviation compensate
#define LED 13
```

```
#define samplingInterval 20
#define printInterval 800
#define ArrayLenth 40 //times of collection
int pHArray[ArrayLenth]; //Store the average value of the sensor feedback
int pHArrayIndex=0;
void setup(void)
{
pinMode(LED,OUTPUT);
Serial.begin(9600);
//Serial.println("pH meter experiment!"); //Test the serial monitor
}
void loop(void)
{
static unsigned long samplingTime = millis();
static unsigned long printTime = millis();
static float pHValue,voltage;
if(millis()-samplingTime > samplingInterval)
{
pHArray[pHArrayIndex++]=analogRead(SensorPin);
if(pHArrayIndex==ArrayLenth)pHArrayIndex=0;
voltage = avergarray(pHArray, ArrayLenth)*3.3/1024;
pHValue = 3.5*voltage-Offset;
samplingTime=millis();
}
if(millis() - printTime > printInterval) //Every 800 milliseconds, print a numerical, convert the
state of the LED indicator
{
//Serial.print("Voltage:");
//Serial.print(voltage,2);
```

```
//Serial.print(" pH value: ");
Serial.println(pHValue,2);
data=(int) pHValue;
Serial.write(data);
//Serial.print(data);
digitalWrite(LED,digitalRead(LED)^1);
printTime=millis();
}
}
double avergearray(int* arr, int number){
int i;
int max,min;
double avg;
long amount=0;
if(number<=0){
//Serial.println("Error number for the array to avraging!/n");
return 0;
}
if(number<5){ //less than 5, calculated directly statistics
for(i=0;i<number;i++){
amount+=arr[i];
}
avg = amount/number;
return avg;
}else{
if(arr[0]<arr[1]){
min = arr[0];max=arr[1];
}
else{
```


INPUT & OUTPUT

7. INPUT & OUTPUT

7.1 Input:

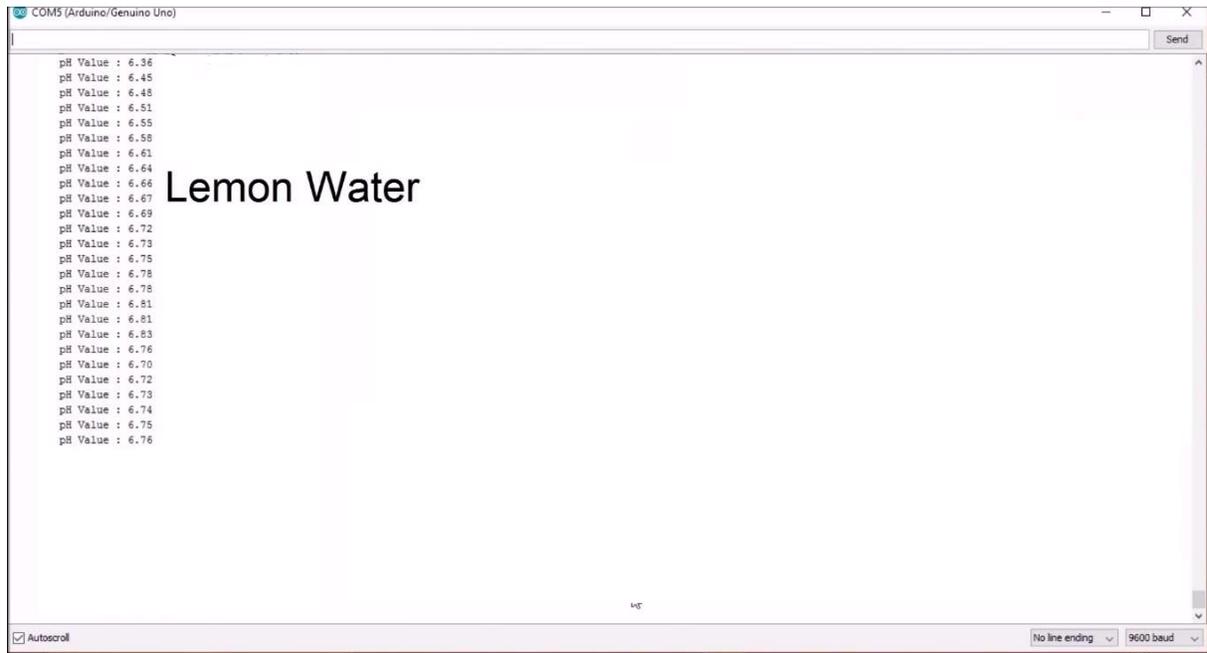
Input Design plays a vital role in the life cycle of software development, it requires very careful attention of developers. The input design is to feed data to the application as accurate as possible. So inputs are supposed to be designed effectively so that the errors occurring while feeding are minimized. According to Software Engineering Concepts, the input forms or screens are designed to provide to have a validation control over the input limit, range and other related validations.

This system has input screens in almost all the modules. Error messages are developed to alert the user whenever he commits some mistakes and guides him in the right way so that invalid entries are not made. Let us see deeply about this under module design.

Input design is the process of converting the user created input into a computer-based format. The goal of the input design is to make the data entry logical and free from errors. The error in the input are controlled by the input design. The application has been developed in user-friendly manner. The forms have been designed in such a way during the processing the cursor is placed in the position where must be entered. The user is also provided within an option to select an appropriate input from various alternatives related to the field in certain cases.

Validations are required for each data entered. Whenever a user enters an erroneous data, error message is displayed and the user can move on to the subsequent pages after completing all the entries in the current page.

7.2.5 Result Of Lemon Water:

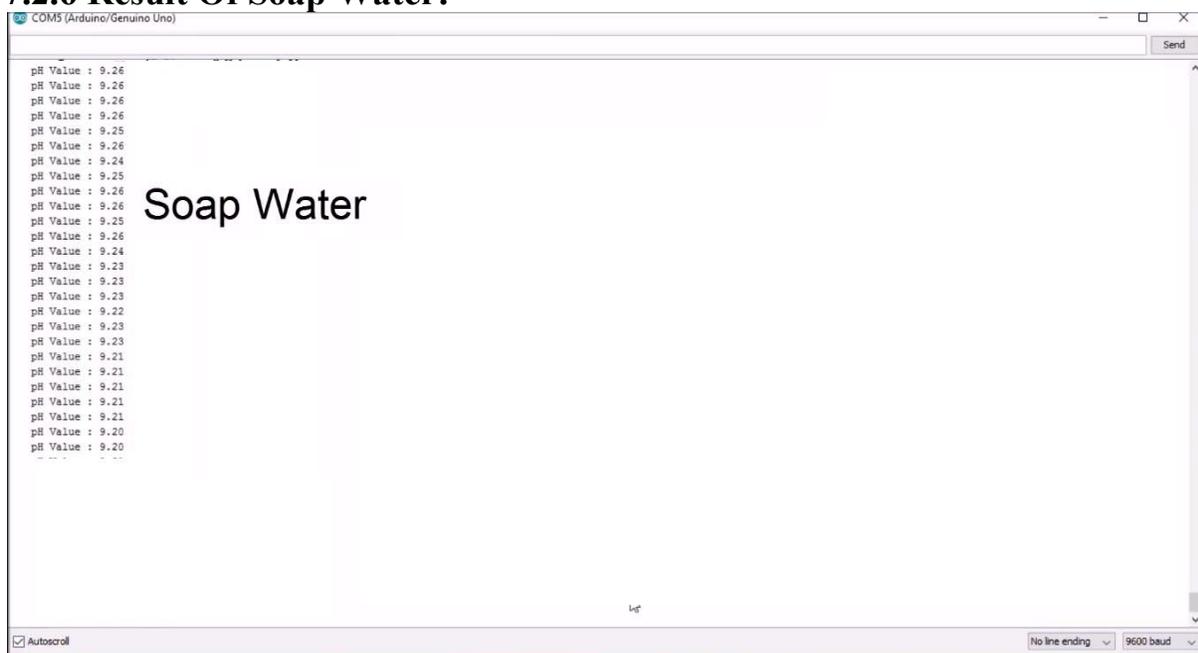


```
COMS (Arduino/Genuino Uno)
pH Value : 6.36
pH Value : 6.45
pH Value : 6.48
pH Value : 6.51
pH Value : 6.55
pH Value : 6.58
pH Value : 6.61
pH Value : 6.64
pH Value : 6.66
pH Value : 6.67
pH Value : 6.69
pH Value : 6.72
pH Value : 6.73
pH Value : 6.75
pH Value : 6.78
pH Value : 6.78
pH Value : 6.81
pH Value : 6.81
pH Value : 6.83
pH Value : 6.76
pH Value : 6.70
pH Value : 6.72
pH Value : 6.73
pH Value : 6.74
pH Value : 6.75
pH Value : 6.76
```

Lemon Water

Figure 7.2.4 Result Of Lemon Water

7.2.6 Result Of Soap Water:



```
COMS (Arduino/Genuino Uno)
pH Value : 9.26
pH Value : 9.26
pH Value : 9.26
pH Value : 9.26
pH Value : 9.25
pH Value : 9.26
pH Value : 9.24
pH Value : 9.25
pH Value : 9.26
pH Value : 9.26
pH Value : 9.25
pH Value : 9.26
pH Value : 9.24
pH Value : 9.23
pH Value : 9.23
pH Value : 9.23
pH Value : 9.22
pH Value : 9.23
pH Value : 9.23
pH Value : 9.21
pH Value : 9.20
pH Value : 9.20
pH Value : 9.20
```

Soap Water

7.2.5Result Of Soap Water

TESTING

8. Testing

8.1 Testing Introduction:

Software testing is a process used to identify the correctness, completeness, and quality of a developed computer software. It includes a set of activities conducted with the intent of finding errors in software so that it could be corrected before the product is provided to the end users. Because of the fallibility of its human designers and its own abstract, complex nature, software development must be accompanied by quality assurance activities. It is not unusual for developers to spend 40% of the total project time on testing.

8.2 Test Cases:

Test case, in software engineering, is a set of conditions under which a tester will determine whether an application/software system or one of its features is working properly or not.

8.2.1 Test Cases For Login Page:

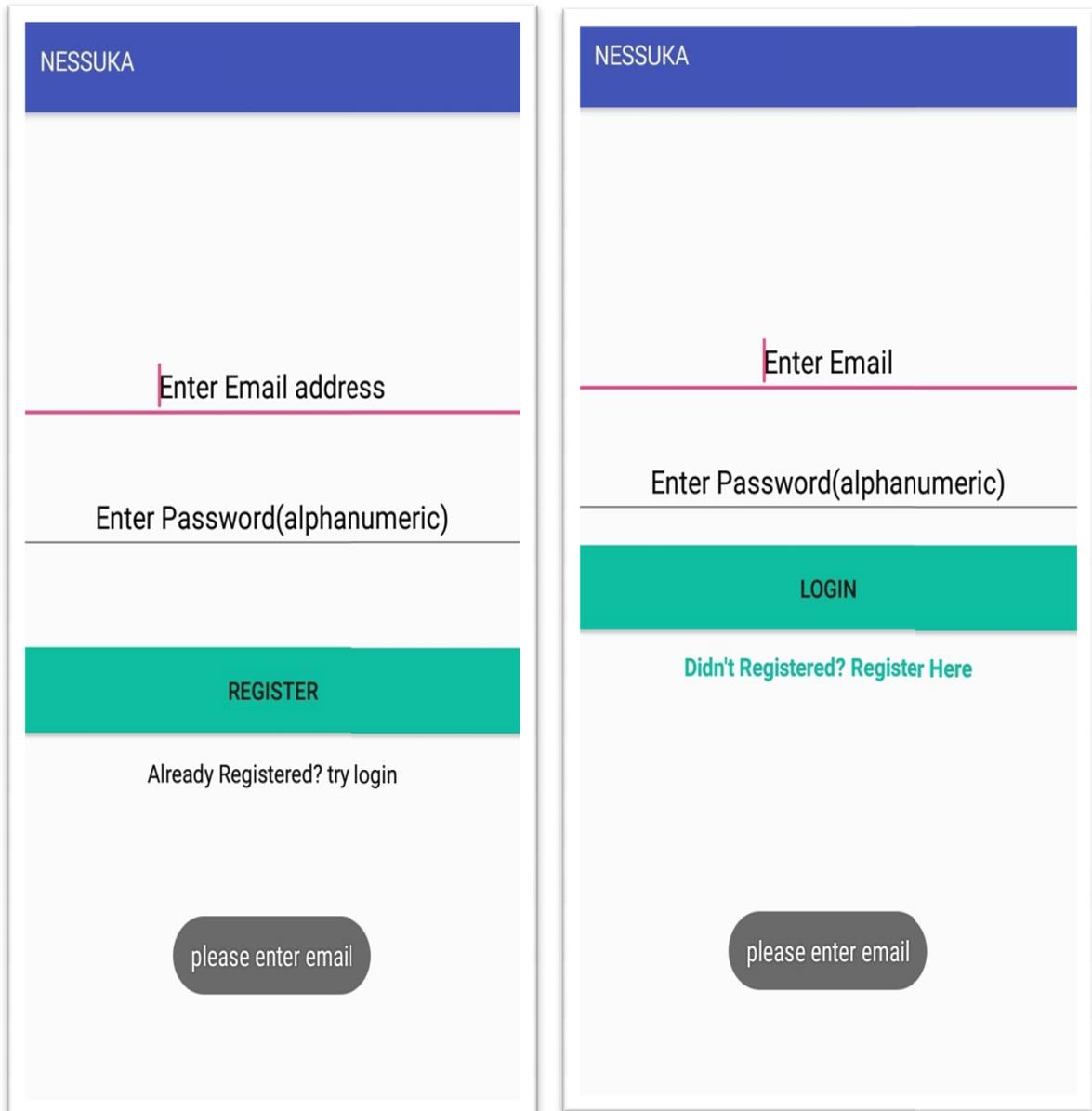
S no.	Test Case	Expected Output
1	With Empty mandatory field click Submit.	It will give message that “Please fill in this Field”.
2	Wrong id/password	It will give message that “You are Not Authorized.”.

Table 8.2.1 Test Cases Table For Login Page

These test cases ensure that the login screen works fine in restricting invalid users or incorrect user credentials while logging into the system.

As it is a dynamic login screen which is accessed by all the users this is to ensure that minimal security is provided while accessing the system and use its functions.

8.2.2 Login Page Test:



The figure displays two screenshots of the NESSUKA login page. Both screenshots feature a blue header with the 'NESSUKA' logo and tagline. The left screenshot shows the registration form with a 'REGISTER' button and a 'please enter email' error message. The right screenshot shows the login form with a 'LOGIN' button and a 'please enter email' error message.

Left Screenshot (Registration Form):

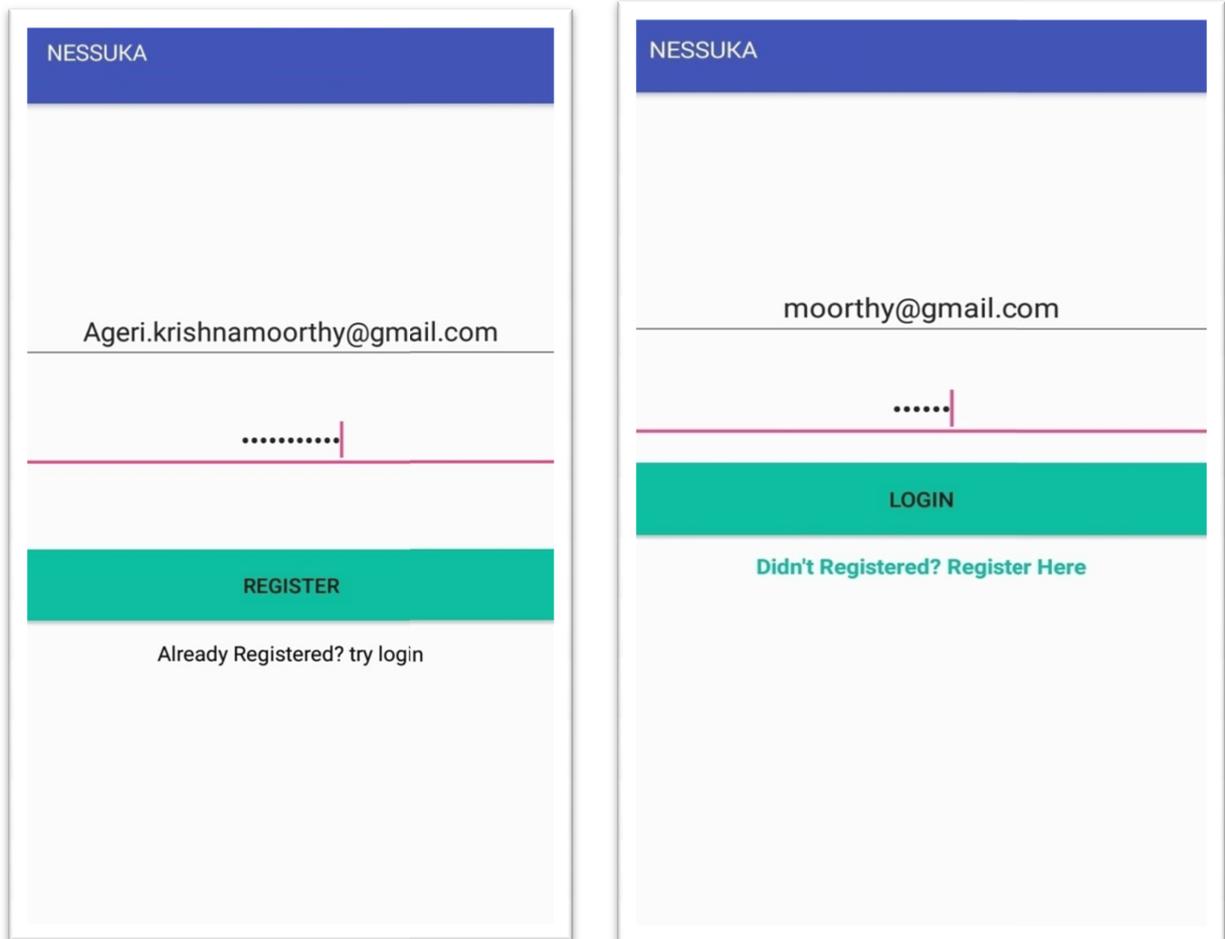
- Header: NESSUKA
- Input field: Enter Email address
- Input field: Enter Password(alphanumeric)
- Button: REGISTER
- Text: Already Registered? try login
- Error message: please enter email

Right Screenshot (Login Form):

- Header: NESSUKA
- Input field: Enter Email
- Input field: Enter Password(alphanumeric)
- Button: LOGIN
- Text: Didn't Registered? Register Here
- Error message: please enter email

Fig. 8.2.1 Test Cases for Login Page

8.2.3 Test Cases for Field's Entry:



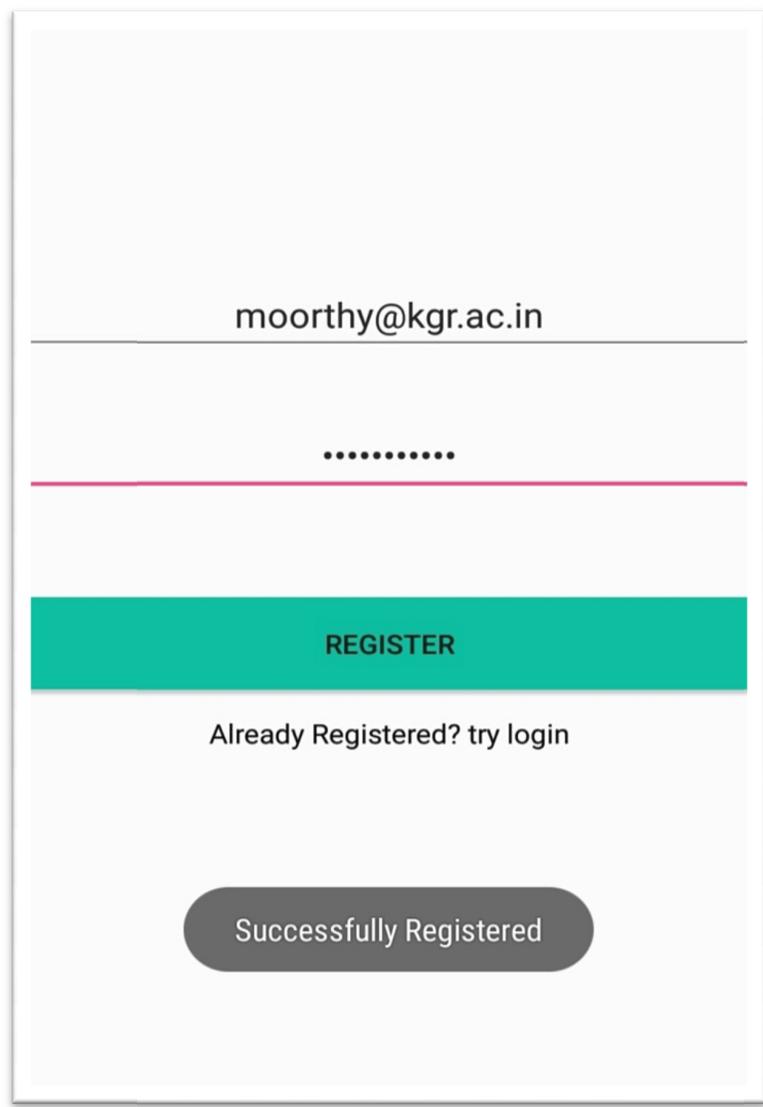
The image shows two screenshots of the NESSUKA web application interface. The left screenshot displays the registration form with the email field containing 'Ageri.krishnamoorthy@gmail.com' and the password field masked with dots. A green 'REGISTER' button is visible at the bottom, along with the text 'Already Registered? try login'. The right screenshot displays the login form with the email field containing 'moorthy@gmail.com' and the password field masked with dots. A green 'LOGIN' button is visible, along with the text 'Didn't Registered? Register Here'.

8.2.2 Test Cases for Field's Entry

The user creation is accompanied with various warning messages while the system administrator enters invalid or incorrect inputs or tries to create user with empty fields that are required to be enter.

8.2.4 Successful Registration:

If user entered mail id which ends with @***. ** And Password with alphanumeric then result will be Successful Registered



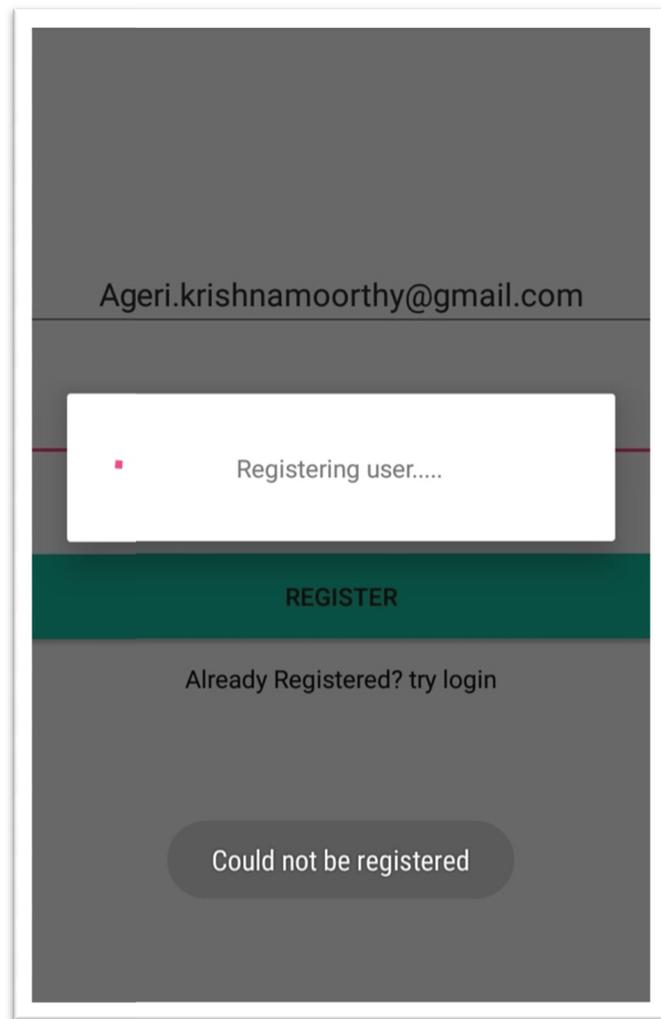
The screenshot shows a registration form with the following elements:

- Email input field containing "moorthy@kgr.ac.in"
- Password input field containing "*****"
- A green "REGISTER" button
- A link: "Already Registered? try login"
- A dark grey button with the text "Successfully Registered"

8.2.3 Successful Registration

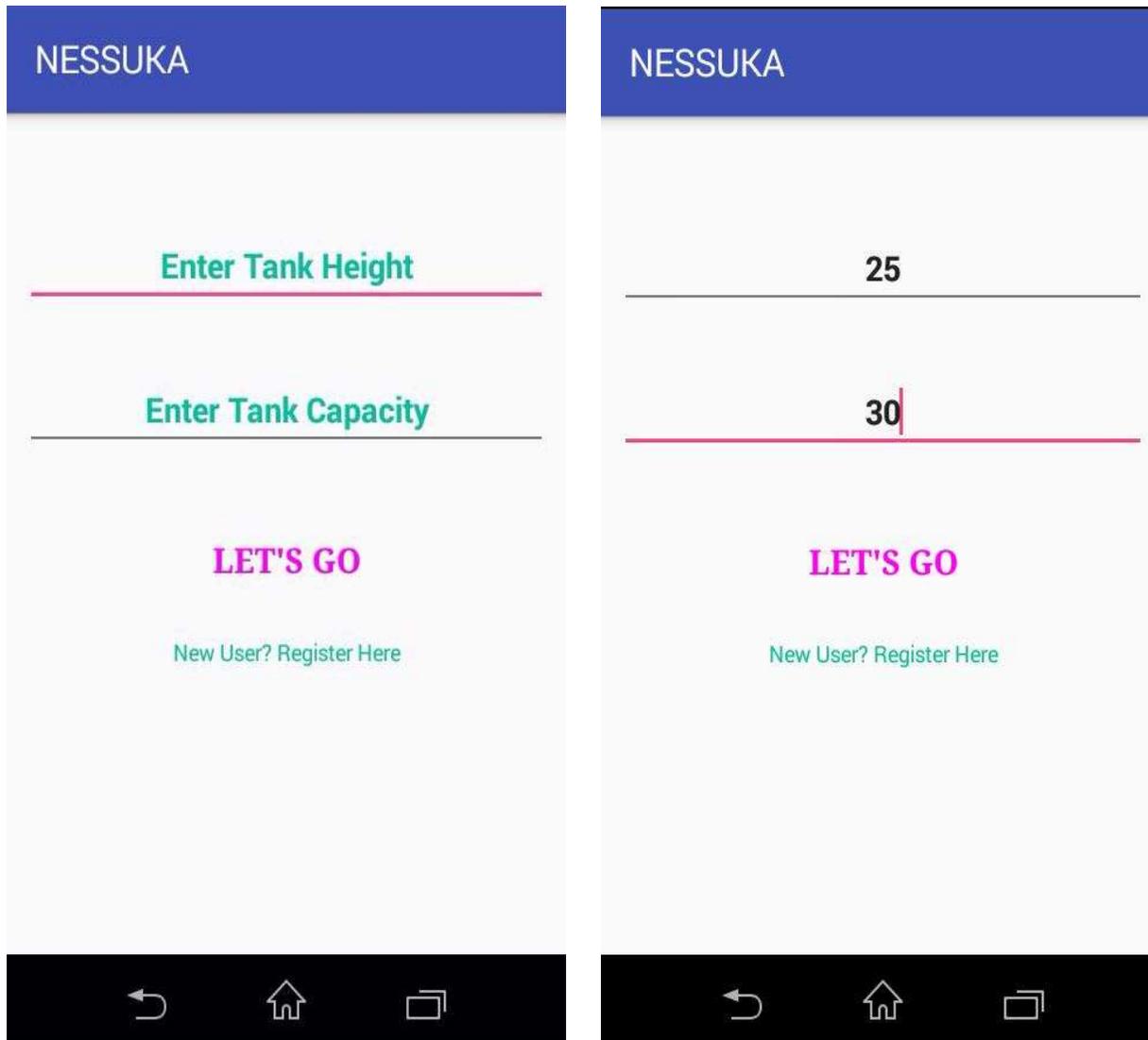
8.2.5 Failed Registration:

If the user id already exists, then a message pops up stating “Could not be Register”.



8.2.4 Failed to Register

8.2.6 User Entry Field's



NESSUKA

Enter Tank Height

Enter Tank Capacity

LET'S GO

New User? Register Here

25

30

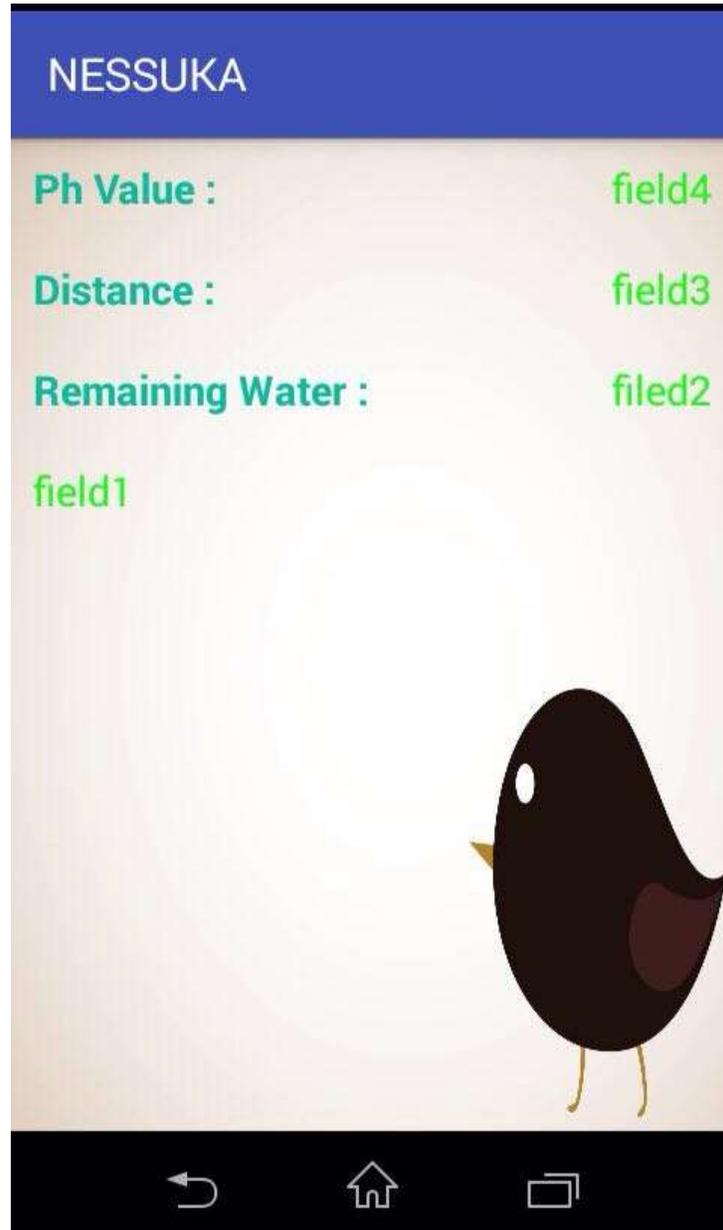
LET'S GO

New User? Register Here

8.2.5 User Entry Field's

8.2.7 User Empty Field's Test:

If user does not entered any fields like tank height and capacity result will be as shown follow

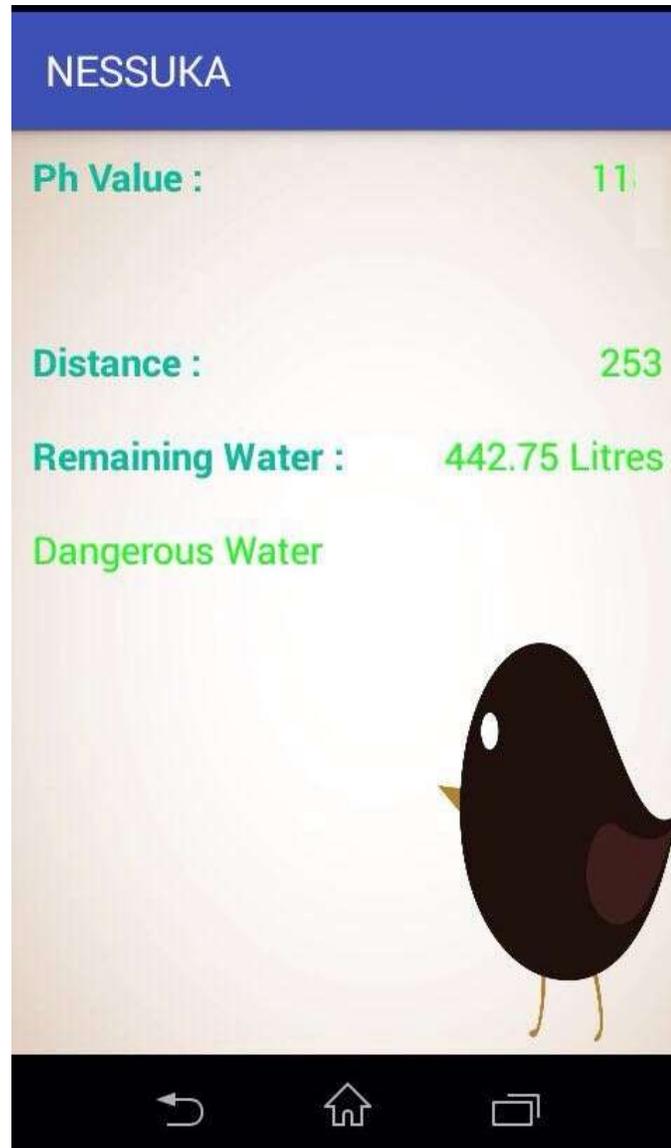


8.2.6 User Empty Field's Test

8.2.8 Changes In Output Based On pH Value:

8.2.8.1 pH > 7:

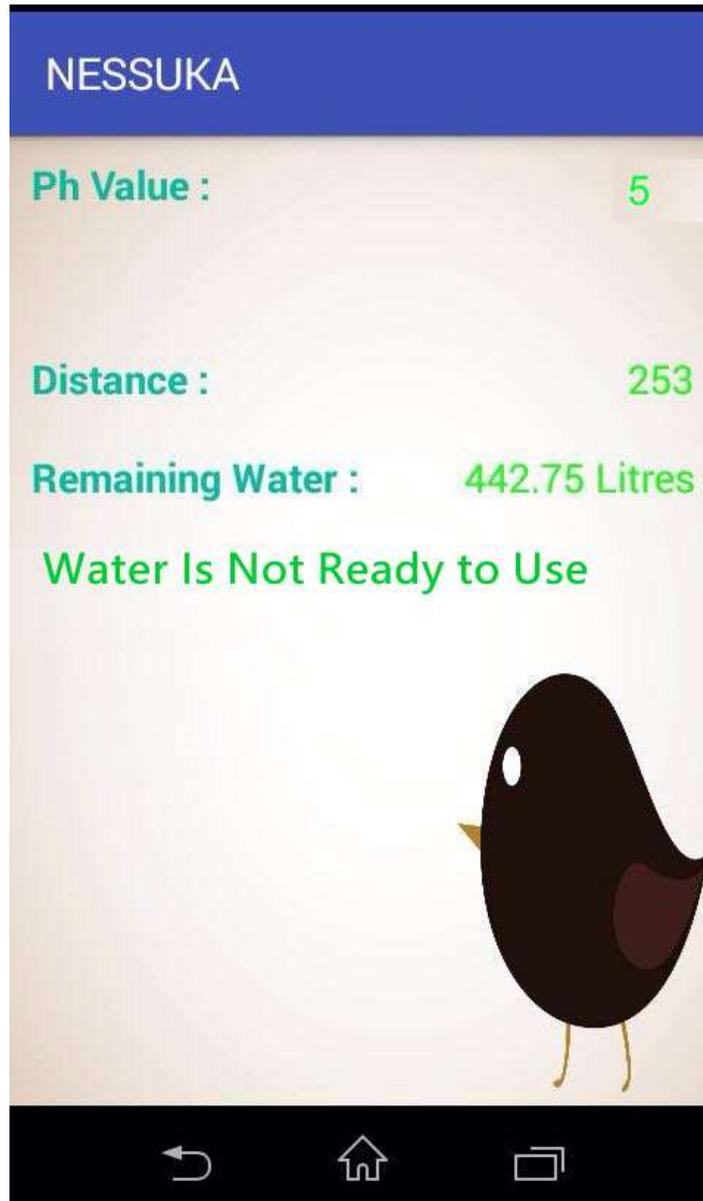
The output shows “Dangerous water” because of pH value is >7.



8.2.7 pH > 7 Output

8.2.8.2 pH < 7:

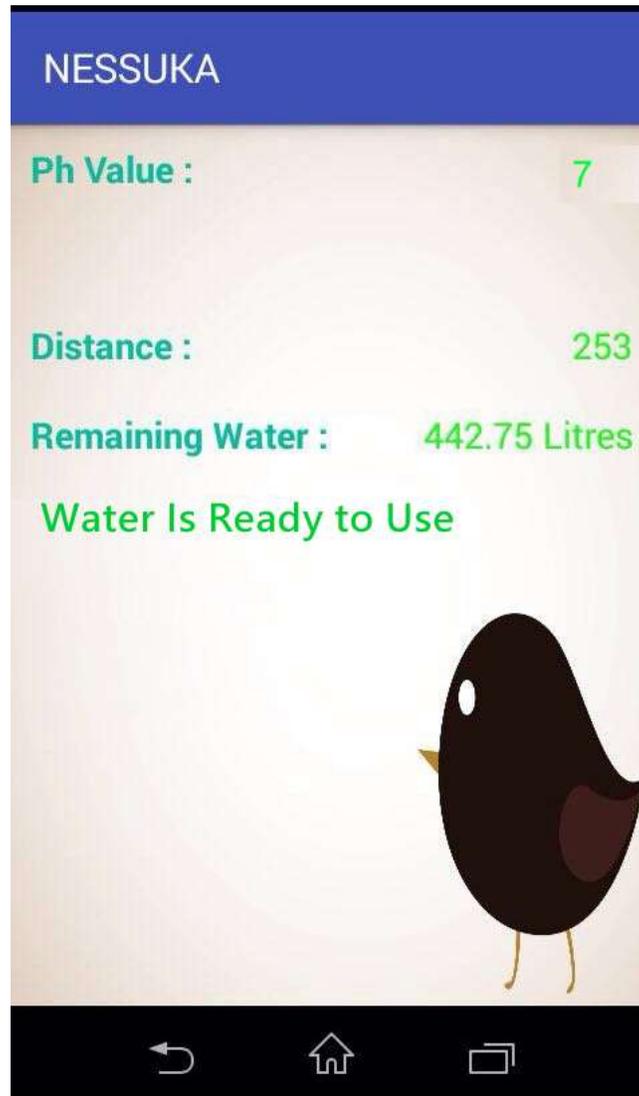
The output shows “water is not ready to use” because of pH value is <7.



8.2.8 pH < 7 Output

8.2.8.3 pH =7:

The output shows “water is ready to use” because of pH value is = 7.



8.2.9 pH = 7 Output

CONCLUSION

9. CONCLUSION

In this project, we are created a Product/Kit which will check the purity and level of water contain in the tank based on pH and Turbidity values present in the water by using IOT technology. These values are stored in the cloud and this can be used for further reference. We have developed an Android Mobile Application namely **NESSUKA** Through this application user can view and check the status of water , details of water tank level and the number of water tank present in the present area. The mobile application has Registration and Login pages so that dynamic dashboard will be appeared, user has to enter two fields those are height and total capacity of the water then user can know whether the water can ready to use or not ready to use or dangerous water based on sensor values through the **NESSUKA** mobile application.

We have provided the list of various technologies that have been used and various programming languages. There are different UML diagrams to facilitate any reader to understand the design of the application.

FUTURE SCOPE

10. FUTURE SCOPE

This project could be extended for Future Scope as the project can be add more equivalent sensors to check other parameters of water Quality and Purification which can give more accurate values to the User . The user can have more than one kit, so that by using one user ID the user can access to multiple KIT/Product's by using same mobile application. Through our Application the user can buy our product and also we are providing the Customer Service to our user through Application. In the Future we will intimate our User about the status of the Application by giving the notification daily once and moreover our Application is not secured, so that we will provide more secure features to our Application in Further process. We can improve in User Interface of application.

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BIBLIOGRAPHY

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