SAVITRIBAI PHULE PUNE UNIVERSITY

PROJECT REPORT ON

Secure & Fair Resource Allocation in Cloud Computing Environment.

SUBMITTED TOWARDS THE
PARTIAL FULFILLMENT OF THE REQUIREMENTS OF

BACHELOR OF ENGINEERING (Computer Engineering)

BY

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Secure & Fair Resource Allocation in Cloud Computing Environment.

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Is a bonafide work carried out by Students under the supervision of Prof. Guide Name and it is submitted towards the partial fulfilment of the requirement of Bachelor of Engineering (Computer Engineering) Project.

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Abstract

Development of computer science and technology, application of network education has become more mature. The technology of network learning resource sharing has been promoted by computers. It is significant promote the development of cloud computing education. Aiming at the need of education resource sharing, combined with the cloud computing service model, infrastructure and key technology. This thesis set up the educational resources sharing system to provide high quality sharing resources for users. Cloud computing is an emerging shared infrastructure through

virtualization technology in a large number of available network resources to form a virtual resource pool, automatic software implementation by management. Their cross-regional, cross-database resource integration capabilities break the scattered data resources to bring the information is not balanced, effective flow of resources and improve utilization; For cloud nodes can be easily added and removed and increase the size of the expansion resources to solve problems. Meanwhile, the data in the cloud uses distributed storage, capable of storing and accessing to share pressures, thereby improving system performance. Cloud resources take a pay model. In this way, the user can customize the resources of independent interest and promote personalized learning.

Acknowledgments

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TABLE OF CONTENTS

1 Synopsis 1

1.1 Project Title 2

1.2 Project Option 2

1.3 Internal Guide 2

1.4 Sponsorship and External Guide 2

1.5 Technical Keywords (As per ACM Keywords) 2

1.6 Problem Statement 3

1.7 Abstract 3

1.8 Goals and Objectives 4

1.9 Relevant mathematics associated with the Project ……. … . . . 4

1.10 Names of Conferences / Journals where papers can be published … 5

1.11 Review of Conference/Journal Papers supporting Project idea ……. 5

1.12 Plan of Project Execution 5

2 Technical Keywords 7

2.1 Area of Project 8

2.2 Technical Keywords 8

3 Introduction 9

3.1 Project Idea 10

3.2 Motivation of the Project 11

3.3 Literature Survey 11

4 Problem Definition and scope 14

4.1 Problem Statement 15

4.1.1 Goals and objectives 15

4.1.2 Statement of scope 15

4.2 Software context. 16

4.3 Major Constraints 16

4.4 Methodologies of Problem solving and efficiency issues 16

4.5 Scenario in which multi-core, Embedded and Distributed Computing used 16

4.6 Outcome 16

4.7 Applications 16

4.8 Hardware Resources Required 16

4.9 Software Resources Required 16

5 Project Plan 18

5.1 Project Estimates 19

5.1.1 Reconciled Estimates 21

5.1.2 Project Resources 22

5.2 Risk Management w.r.t. NP Hard analysis 22

5.2.1 Risk Identification 22

5.2.2 Risk Analysis 24

5.2.3 Overview of Risk Mitigation, Monitoring, Management 24

5.3 Project Schedule 27

5.3.1 Project task set 27

5.3.2 Task network 27

5.3.3 Timeline Chart 28

5.4 Team Organization 28

5.4.1 Team structure 28

5.4.2 Management reporting and communication 29

6 `Software requirement specification (SRS is to be prepared using relevant mathematics derived and software Engg. Indicators in Annex A and B) 30

6.1 Introduction 31

6.1.1 Purpose and Scope of Document 31

6.1.2 Overview of responsibilities of Developer 31

6.2 Usage Scenario 32

6.2.1 User profiles. 32

6.2.2 Use-cases 32

6.2.3 Use Case View 32

6.3 Data Model and Description 33

6.3.1 Data Description 33

6.3.2 Data objects and Relationships..... 34

6.4 Functional Model and Description 34

6.4.1 Data Flow Diagram 35

6.4.2 Description of functions 35

6.4.3 Activity Diagram. 36

6.4.4 Non Functional Requirements 36

6.4.5 State Diagram 38

6.4.6 Design Constraints. 38

6.4.7 Software Interface Description. 38

7 Detailed Design Document using Appendix A and B

7.1 Introduction 42

7.2 Architectural Design. . . . . .

7.3 Data design (using Appendices A and B) . . . . . .

7.4 Component Design . . . . . .

7.5 Class Diagram. . . . . .

9 References 47

Annexure A Laboratory assignments on Project Analysis of Algorithmic Design 49

Annexure B Laboratory assignments on Project Quality and Reliability Testing of Project Design 51

Annexure C Project Planner 53

Annexure D Reviewers Comments of Paper Submitted 55

Annexure E Plagiarism Report 57

List of Figures

5.1Waterfall model 19

6.1 Use case diagram 33

6.2 ER diagram 34

6.3 DFD Level 0 diagram 35

6.4 DFD Level 1 diagram 35

6.5 Activity diagram 36

6.6 State transition diagram 38

7.1 Architecture diagram 42

7.2 Class Diagram 44

CHAPTER 1

SYNOPSIS

1.1 PROJECT TITLE

Secure & Fair Resource Allocation in Cloud Computing Environment.

1.2 INTERNAL GUIDE

Prof. Prerna Rawat

1.3 TECHNICAL KEYWORDS (AS PER ACM KEYWORDS)

1. C. Computer Systems Organization

(a) C.2 COMPUTER-COMMUNICATION NETWORKS

I. C.2.4 Distributed Systems

A. Client/server

B. Distributed applications

C. Distributed databases

D. Network operating systems

E. Distributed file systems

F. Security and reliability issues in distributed applications

1.6 PROBLEM STATEMENT

Cloud computing provide various computing resources as services over internet. These computing resources can be demanded and configure on real time. Cloud Service providers are always looking for upgrading functionality and quality of various services offered by them. Data centers are used to build cloud with large and distributed infrastructure, and to improve its functionality factors like load balancing, availability, scalability and elasticity are highly responsible. Thus these factors are always considered for the enlargement of cloud architecture. Proposed research work is brief discussion on clustering shared resources in cloud and its implementation.

Resources in cloud plays vital role due to its distribute and service oriented architecture. Proper placements and configuring these resources leads to more stable cloud architecture. As Cloud architecture comes with verity of shared resources, clustering these shared resources lead to performance improvement with better utilization and providing quality services to end users.

1.7 ABSTRACT

- Development of computer science and technology, application of network education has become more mature. The technology of network learning resource sharing has been promoted by computers. It is significant promote the development of cloud computing education. Aiming at the need of education resource sharing, combined with the cloud computing service model, infrastructure and key technology. This thesis set up the educational resources sharing system to provide high quality sharing resources for users. Cloud computing is an emerging shared infrastructure through virtualization technology in a large number of available network resources to form a virtual resource pool, automatic software implementation by management. Their crossregional, cross-database resource integration capabilities break the scattered data resources to

bring the information is not balanced, effective flow of resources and improve utilization; For cloud nodes can be easily added and removed and increase the size of the expansion resources to solve problems.

Meanwhile, the data in the cloud

Uses distributed storage, capable of storing and accessing to share pressures, thereby improving system performance. Cloud resources take a pay model. In this way, the user can customize the resources of independent interest and promote personalized learning.

1.8 GOALS AND OBJECTIVES

- To clustering shared resources in cloud and its implementation.
- To provide resources on the basis of sharing in cloud computing.
- To implement large scale distributed system with vast resource available and its utilization on internet, and provides services.
- Performance is high.
- Customer satisfaction in solving optimal configuration problem with resource utilization regarding cloud resource sharing on virtual resources.
- Improve the service quality of service provider.

1.9 RELEVANT MATHEMATICS ASSOCIATED WITH THE PROJECT

System Description:

- Input:
- Output:

- Input Data : Users File/data
- Output Data: Store users files/data using cloud service receivers PC.

- User Grouping
- G = {fU1, U2,….. , Umg}

- Weight sum aggregation of Cloud Resource Sharing

1.10 NAMES OF CONFERENCES / JOURNALS WHERE PAPERS CAN BE PUBLISHED

SR NO	DURATION	ACTIVITY PERFORMED

- IEEE/ACM Conference/Journal 1
- Conferences/workshops in IITs
- Central Universities or SPPU Conferences
- IEEE/ACM Conference/Journal 2

1.11 REVIEW OF CONFERENCE/JOURNAL PAPERS SUPPORTING PROJECT IDEA At least 10 papers + White papers or web references

Brief literature survey [Description containing important description of at least 10 papers

1.12 PLAN OF PROJECT EXECUTION

Table 1.1: System Implementation Plan

1	July second week	Topic Finalization
2	3rd and 4th week of July	Understanding of Base Paper
3	1st and 2nd week of August	Literature Survey
4	3rd and 4th week of August	System Architecture Design Completion
5	1stand 2nd week of September	1st review Completed
6	3rd and 4th week of September	2nd review Completed
7	1st week of October	UML diagrams, State Charts and DFD's Completed
8	2nd week of October	3rd Review Completed
9	3rd and 4th week of October	Final review completed
10	November	Exam
11	December second week	Distribution of implementation modules
12	January	Project implementation in modules
13	February	Development of the entire module
14	March	Testing of the project
15	May Second week	Final Report Submission

CHAPTER 2

TECHNICAL KEYWORDS

2.1 AREA OF PROJECT

Cloud Computing

2.2 TECHNICAL KEYWORDS

Technical Key Words:

- Cloud Computing
- Cloud Resource Sharing (CRS) model
- Virtual Machine (VM), Customize
- Cloud computing system in localhost
- network, Task Scheduling, Resource Allocation

CHAPTER 3

INTRODUCTION

The rapid development of information technology has long-term impact on all areas of human life, including education. The fast development of long-distance education promotes the education of informasation process, and play an important role in promoting the popularization of higher education, the construction of the national education system and the learning of social services, and construction of lifelong education system.

The building of education resources is the foundation and core of distance education. Concerned with the education resources construction to enhance education resources management is an extremely urgent task. The number of learning resources grow rapidly. But the quality of resource is uneven, duplicate resources seriously lack of effective organization and management. Education resources are in a highly dispersed and disordered state, reducing the utilization of resources and affected the effective of sharing resources, which has become a major problem for the construction of education resources in information technology. The main research contents and achievements of this thesis are as follow. To learn the traditional method of educational resource sharing, and to analyse problems. Then analyse of key elements and techniques to build an educational resource sharing system based on cloud computing. Learning cloud computing, virtualization, IaaS and OpenStack theory and related technologies.

Researching system architecture of cloud computing, and integration of the existing physical infrastructure, then building a cloud computing infrastructure with the Open Stack open source project to form a resource pool and providing external IaaS services.

Analysing of demand resource sharing system gives the overall architecture of system, and applies the detailed design and analysis for each function level. Design of the overall program, technical implementation of all levels, and researching key issues, such as scheduling policy implementation, customized access interfaces, and gives detailed solutions. Final stage is testing and analyses the system.

3.1 PROJECT IDEA

- Cloud computing platform is a powerful cloud service network, which connects on a large number of concurrent computing and network services. Cloud computing platform uses virtualization technology to expand the ability of each server. The respective resources are combined with the processing and storage of data through cloud computing platform , which are also completed by passing ”cloud” side of the server cluster. A large data processing centre is responsible for unified management and providing supercomputing storage capacity.

3.2 MOTIVATION OF THE PROJECT

- Cloud computing is a process carried out on a large scale distributed system with vast resource available and it’s utilization on internet, and provides services, sitting in some remote Data Centre (DC).It is a set of approaches that helps to the organization to quickly and effectively add or subtract resources in real time systems and operations in distributed environment.

- Although cloud computing provide platform to deploy large scale workflow applications on real time with dynamic resources.

3.3 LITERATURE SURVEY

- Ashima, Vikramjit Singh, A Novel Approach of Job Allocation Using Multiple Parameters in Cloud Environment.

  Author propose an improved load balancing algorithm for job scheduling in the Grid environment. Hence, in this research work, a multi-objective load balancing algorithm has been proposed to avoid deadlocks and to provide proper utilization of all the virtual machines (VMs) while processing the requests received from the users by VM classification. The capacity of virtual machine is computed based on multiple parameters like MIPS, RAM and bandwidth. Heterogeneous virtual machines of different MIPS and processing

power in multiple data centres with different hosts have been created in cloud simulator. The VMs are divided into 2 clusters using K-Me Answer clustering mechanism in terms of processor MIPS, memory and bandwidth. The cloudlets are divided into two categories like High QOS and Low QOS based on the instruction size. The cloudlet whose task size is greater than the threshold value will enter into High QOS and cloudlet whose task size is lesser than the threshold value will enter into Low QOS. Submit the job of the user to the data centre broker. The job of the user is submitted to the broker and it will first find the suitable VM according to the requirements of the cloudlet and will match VM depending upon its availability. Multiple parameters have been evaluated like waiting time, turnaround time, execution time and processing cost. This modified algorithm has an edge over the original approach in which each cloudlet build their own individual result set and it is later on built into a complete solution.

- Mayanka Katyal, Atul Mishra, a Comparative Study of Load Balancing Algorithms in Cloud Computing Environment.

  Cloud computing is a new trend emerging in IT environment with huge requirements of infrastructure and resources. Load Balancing is an important aspect of cloud computing environment. Efficient load balancing scheme ensures efficient resource utilization by provisioning of resources to cloud users on demand basis in pay-as-you-say-manner. Load Balancing may even support prioritizing users by applying appropriate scheduling criteria. This paper presents various load balancing schemes in different cloud environment based on requirements specified in Service Level Agreement (SLA).

- Sheenam Kamboj, Mr. Navtej Singh Ghumman, an Implementation of Load Balancing Algorithm in Cloud Environment.

  Cloud Computing is an emerging computing paradigm. It aims to share data, calculations, and service transparently over scalable network of nodes. Since Cloud

computing stores the data and disseminated resources in the open environment. So, the amount of data storage increases quickly. As we know that a cloud is the collection of many nodes, which can support various types of application that is used by the clients on a basis of pay per use. Therefore, the system, which is incurring a cost for the user should function smoothly and should have algorithms that can continue the proper system functioning even at peak usage. In this paper, a load balancing algorithm has been discussed and implemented

In Clouds environment. Multiple number of experiments have been conducted to analyse the results.

- Zahra Ali, Raihan ur Rasool, Peter Bloodworth, Social Networking for Sharing Cloud Resources".

  In developing countries it is often too expensive for people to acquire a virtual machine of their own. Users may therefore wish to manage costs and increase computational resource usage by sharing their instances with others. Sadly it is not easy to do this at present. Social networks provide a structure that allows users to interact and share resources (e.g. pictures and videos) on the basis of a trustworthy relationship (e.g. Friendship). This paper highlights a Cloud Resource Bartering model (CRB-model) for sharing user's computational resources through a social network. In our approach we have linked a social network with the computational cloud to create a social cloud (SC) so that users can share their part of the cloud with their social community. A prototype system has been deployed on a social network by using the bartering resource trading mechanism. It is anticipated that this may help users to share their dedicated resources without the need for money changing hands and different communities. Multiple privacy demands, which blocks their application in the real-world cloud. This paper proposes a practical solution for privacy preserving medical record sharing for cloud computing. Based on the classification of the attributes of medical records, we use vertical partition of medical dataset to achieve the consideration of different parts of medical data with different privacy concerns.

CHAPTER 4

PROBLEM DEFINITION AND SCOPE

4.1 PROBLEM STATEMENT

Resource sharing in the cloud Computing environment is the major issues that limited application of the cloud computing. The research work comprises the issue handling of Resource sharing in the cloud Computing approach for online system and provide the flexible solution or environment for sharing their resources in computational cloud in localhost to enable tenants to share their unused cloud resources fragment with other users.

4.1.1 Goals and objectives Goal

and Objectives:

- To clustering shared resources in cloud and its implementation.
- To provide resources on the basis of sharing in cloud computing.
- To implement large scale distributed system with vast resource available and its utilization on internet, and provides services.
- Performance is high.
- Customer satisfaction in solving optimal configuration problem with resource utilization regarding cloud resource sharing on virtual resources.
- Improve the service quality of service provider.

4.1.2 Statement of scope

- We design and developed an application which is used for sharing the resources for storing the files or data on any device which is having space for it. No similar system we have introduced here.
- This project presents resource sharing approach for storing the large amount of data on devices.

4.2 SOFTWARE CONTEXT

- The business or product line context or application of the software is to be given

4.3 MAJOR CONSTRAINTS

- Any constraints that will impact the manner in which the software is to be specified, designed, implemented or tested are noted here.

4.4 METHODOLOGIES OF PROBLEM SOLVING AND EFFICIENCY ISSUES

- The single problem can be solved by different solutions. This considers the performance parameters for each approach. Thus considers the efficiency Issues.

4.5 SCENARIO IN WHICH MULTI-CORE, EMBEDDED AND DISTRIBUTED COMPUTING USED

Explain the scenario in which multi-core, embedded and distributed computing methodology can be applied.

4.6 OUTCOME

- Outcome of the project

4.7 APPLICATIONS

- Applications of Project

4.8 HARDWARE RESOURCES REQUIRED

4.9 SOFTWARE RESOURCES REQUIRED

Platform:

Sr. No.	Parameter	Minimum Requirement	Justification
1	CPU Speed	2 GHz	Remark Required
2	RAM	3 GB	Remark Required

Table 4.1: Hardware Requirements

1. Operating System:
2. IDE:
3. Programming Language

CHAPTER 5

PROJECT PLAN

5.1 PROJECT ESTIMATES

We are using waterfall model for our project.

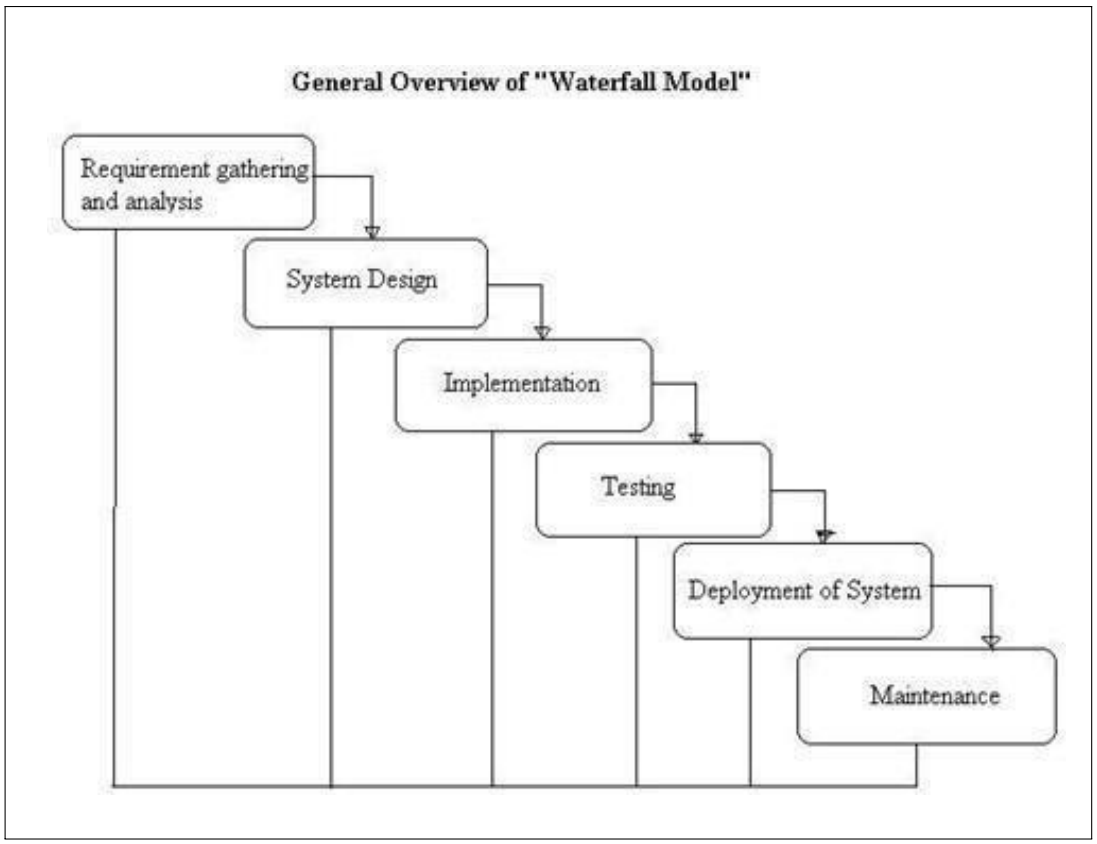


Figure 5.1: Waterfall model

1. Requirement gathering and analysis:

   In this step of waterfall we identify what are various requirements are need for our project such are software and hardware required, database, and interfaces.

2. System Design:

In this system design phase we design the system which is easily understood for end user i.e. user friendly. We design some UML diagrams and data flow diagram to understand the system flow and system module and sequence of Execution.

3. Implementation:

   In implementation phase of our project we have implemented various module required of successfully getting expected outcome at the different module levels. With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.

4. Testing:

   The different test cases are performed to test whether the project module are giving expected outcome in assumed time.

   All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.

5. Deployment of System:

   Once the functional and non-functional testing is done, the product is deployed in the customer environment or released into the market.

6. Maintenance:

   There are some issues which come up in the client environment. To fix those issues patches are released. Also to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment.

All these phases are cascaded to each other in which progress is seen as flowing steadily downwards like a waterfall through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, so the name “Waterfall Model”. In this model phases do not Overlap.

5.1.1 Reconciled Estimates

5.1.1.1 Cost Estimate

The project cost can be found using any one of the model.

COCOMO-1 Model

COCOMO-2 Model

Model -1: The basic COCOMO model computes software development efforts as a function of program size expressed in estimated lines of code.

Model-2: The intermediate COCOMO model computes software development efforts as a function of program size and a set of cost drivers that include subjective assessment of the product, hardware, personnel, project attributes

Model-3: The advanced COCOMO model incorporates all characteristics of the intermediate version with an assessment of the cost drivers impact on each step of the software engineering process. Following is the basic COCOMO -2 model.

Software Project	A(b)	B(b)	C(b)	D(b)
Organic	2.4	1.05	2.5	0.38
Semi-detached	3.0	1.22	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

The basic COCOMO -2 model equations take form:

E=A(b)KLOCB(b)

D=C(b)ED(b)

Where E is the effort applied in person months. D is development time in chronological month. KLOC is estimated number of delivered lines of code for the project. This project can be classified as Semidetached software project. The rough estimate of number of lines of this project is

9.072k.Applying the above formula

E=3.0*(9.072)1.22

= 44.20 person- months

D=2.5* 44.35

= 9.40 months

5.1.1.2 Time Estimates

The time estimate of this project is approximate 11 months.

5.1.2 Project Resources

Well configured Laptop, eclipse IDE, 2 GHZ CPU speed, 2 GB RAM, Internet connection

5.2 RISK MANAGEMENT W.R.T. NP HARD ANALYSIS

1. In appropriate dataset -To overcome this risk we are trying to use well organized and complete dataset.
2. Security- To overcome and improving security we use multilevel security like access permissions of user.

5.2.1 Risk Identification

1. Have top software and customer managers formally committed to support the project?
   Answer-Not applicable.
2. Are end-users enthusiastically committed to the project and the system/product to be built?

Answer-Not known at this time.

3. Are requirements fully understood by the software engineering team and its customers?

Answer-Yes

4. Have customers been involved fully in the definition of requirements?
   Answer-

Not applicable

5. Do end-users have realistic expectations?

Answer-Not applicable

6. Does the software engineering team have the right mix of skills?

Answer-yes

7. Are project requirements stable?

Answer-Not applicable

8. Is the number of people on the project team adequate to do the job?

Answer-Not applicable

9. Do all customer/user constituencies agree on the importance of the project and on the requirements for the system/product to be built?

Answer -Not applicable

5.2.2 Risk Analysis

The risks for the Project can be analysed within the constraints of time and Quality

ID	Risk Description	Probability	Impact		
			Schedule	Quality	Overall
1	Description 1	Low	Low	High	High
2	Description 2	Low	Low	High	High

Table 5.1: Risk Table

Probability	Value	Description
High	Probability of occurrence is	> 75%
Medium	Probability of occurrence is	26−75%
Low	Probability of occurrence is	< 25%

Table 5.2: Risk Probability definitions [1]

Impact	Value	Description
Very high	> 10%	Schedule impact or Unacceptable quality
High	5−10%	Schedule impact or Some parts of the project have low quality
Medium	< 5%	Schedule impact or Barely noticeable degradation in quality Low Impact on schedule or Quality can be incorporated

Table 5.3: Risk Impact definitions [1]

5.2.3 Overview of Risk Mitigation, Monitoring, Management

If a software team adopts a proactive approach to risk, avoidance is always the best strategy. This is achieved by developing a plan for risk mitigation. To mitigate this risk, you would develop a strategy for reducing turnover. Among the possible steps to be taken are:

- Meet with current staff to determine causes for turnover (e.g., poor working conditions, low pay, and competitive job market).
- Mitigate those causes that are under your control before the project starts.
- Once the project commences, assume turnover will occur and develop techniques to ensure continuity when people leave.
- Organize project teams so that information about each development activity is widely dispersed.
- Define work product standards and establish mechanisms to be sure that all models and documents are developed in a timely manner.
- Conduct peer reviews of all work (so that more than one person is “up to Speed”).
- Assign a backup staff member for every critical technologist.

Risk ID	1
Risk Description	Description 1
Category	Development Environment.
Source	Software requirement Specification document.
Probability	Low
Impact	High
Response	Mitigate
Strategy	Strategy
Risk Status	Occurred

2. Risk Monitoring

As the project proceeds, risk-monitoring activities commence. The project manager monitors factors that may provide an indication of whether the risk

is becoming more or less likely. In the case of high staff turnover, the general attitude of team members based on project pressures, the degree to which the team has jelled, interpersonal relationships among team members, potential problems with compensation and benefits, and the availability of jobs within the company and outside it are all monitored.

Risk ID	2
Risk Description	Description 2
Category	Requirements
Source	Software Design Specification documentation review.
Probability	Low
Impact	High
Response	Mitigate
Strategy	Better testing will resolve this issue.
Risk Status	Identified
Risk ID	3
Risk Description	Description 3
Category	Technology
Source	This was identified during early development and testing.
Probability	Low
Impact	Very High
Response	Accept
Strategy	Example Running Service Registry behind proxy balancer
Risk Status	Identified

3. Risk Management

Risk management and contingency planning assumes that mitigation efforts have failed and that the risk has become a reality. Continuing the example, the project is well under way and a number of people announce that they will be leaving. If the mitigation strategy has been followed, backup is available, information is documented, and knowledge has been dispersed across the team. In addition, you can temporarily refocus resources (and readjust the project schedule) to those functions that are fully staffed, enabling newcomers who must be added to the team to "get up to speed." Those individuals who are leaving are asked to stop all work and spend their last weeks in "knowledge transfer mode." This might include video-based knowledge capture, the development of "commentary documents or Wikis," and/or meeting with other team members who will remain on the project.

5.3 PROJECT SCHEDULE

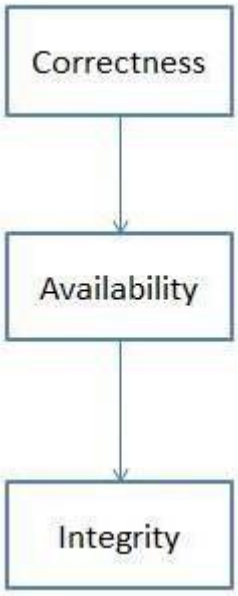
5.3.1 Project task set

Major Tasks in the Project stages are:

- Task 1: correctness
- Task 2: availability
- Task 3: integrity

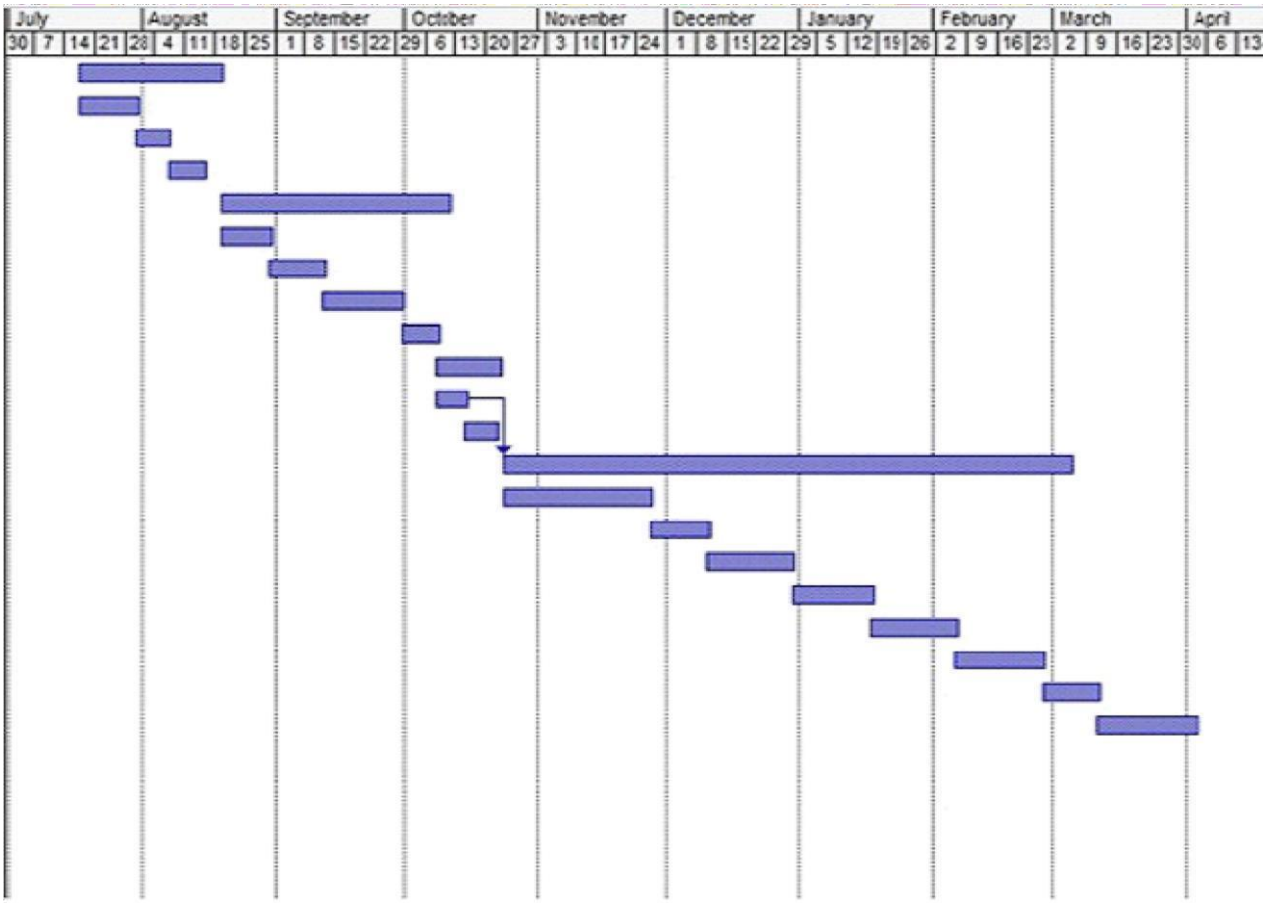
5.3.2 Task network

Project tasks and their dependencies are noted in this diagrammatic form.



5.3.3 Timeline Chart

A project timeline chart is presented. This may include a time line for the entire project. Above points should be covered in Project Planner as Annex C and you can mention here Please refer Annex C for the planner



5.4 TEAM ORGANIZATION

Team consists of 4 members and proper planning mechanism is used and roles of each member are defined.

5.4.1 Team structure

The team structure for the project is identified. There are total 4 members in our team and roles are defined. All members are contributing in all the phases of project.

5.4.2 Management reporting and communication

Well planning mechanisms are used for progress reporting and inter/intra team communication are identified as per requirements of the project.

Month Scheduled	Phase	Name of Group Members	Work done
June-August	Topic searching		Topic Searched
August September August-September	Topic selection Project confirmation		Topic Selected Project Confirmed
August-September	Literature Sur- Vey		Literature Sur- vey Done
September-October September-October	Requirement Analysis Requirement Gathering		Requirement Analysis Done Requirements Gathered
November-December	Designing		Architecture Design
November-December	Designing Test		GUI Tested
November-December	Database Creation		Database Tested
January-February	Coding		Coded Different modules
January-February	Database And Modules Connectivity		Connectivity Done
March	Testing of project		Project Tested
April	Result Analysis		Result Analysis

CHAPTER 6

SOFTWARE REQUIREMENT SPECIFICATION

(SRS IS TO BE PREPARED USING RELEVANT MATHEMATICS DERIVED AND SOFTWARE ENGG. INDICATORS IN ANNEX A AND B)

6.1 INTRODUCTION

6.1.1 Purpose and Scope of Document

The goal of this document is to provide support information on our project. It will attempt to explain the functionality of the program and the features it provides. Note: it will not fully describe how the program works or how the user should use it. For that purpose, one should read the user's manual, which is written by the creators of the project.

1. Meets the business and technical requirements that guided its design and development;
2. Works as expected; and
3. Can be implemented with the same characteristics

6.1.2 Overview of responsibilities of Developer

1. To have understanding of the problem statement.
2. To know what are the hardware and software requirements of proposed System.
3. To have understanding of proposed system.
4. To do planning various activates with the help of planner.
5. Designing, programming, testing etc.

6. Working with the Project Manager on definition of development requirements and priorities.
7. Data Migration.
8. Interfaces with other systems.
9. Reporting configuration and deployment.
10. Set up and maintenance of security rights and access permissions.
11. Contributing to technical strategy, policy and procedure.
12. Development and operation of technical testing programs.
13. Production of technical documentation to agreed quality standards.
14. Reporting on progress/issues to management and users.

6.2 USAGE SCENARIO

1. User: User has to login with correct credentials.
2. System: System perform review analysis 6.2.1 User profiles

There is user or actors which are as follows,

1. User has the account and for accessing that he/she must be provide the correct username and password. 6.2.2 Use cases

All use-cases for the software are presented. Description of all main Use cases use case template is to be provided.

6.2.1 User profiles

The profiles of all user categories are described here.(Actors and their Description)

6.2.2 Use-cases

All use-cases for the software are presented. Description of all main Use cases using use case template is to be provided.

Sr No.	Use Case	Description	Actors	Assumptions
1	Use Case 1	Description	Actors	Assumption

Table 6.1: Use Cases

6.2.3 Use Case View

Use Case Diagram. Example is given below

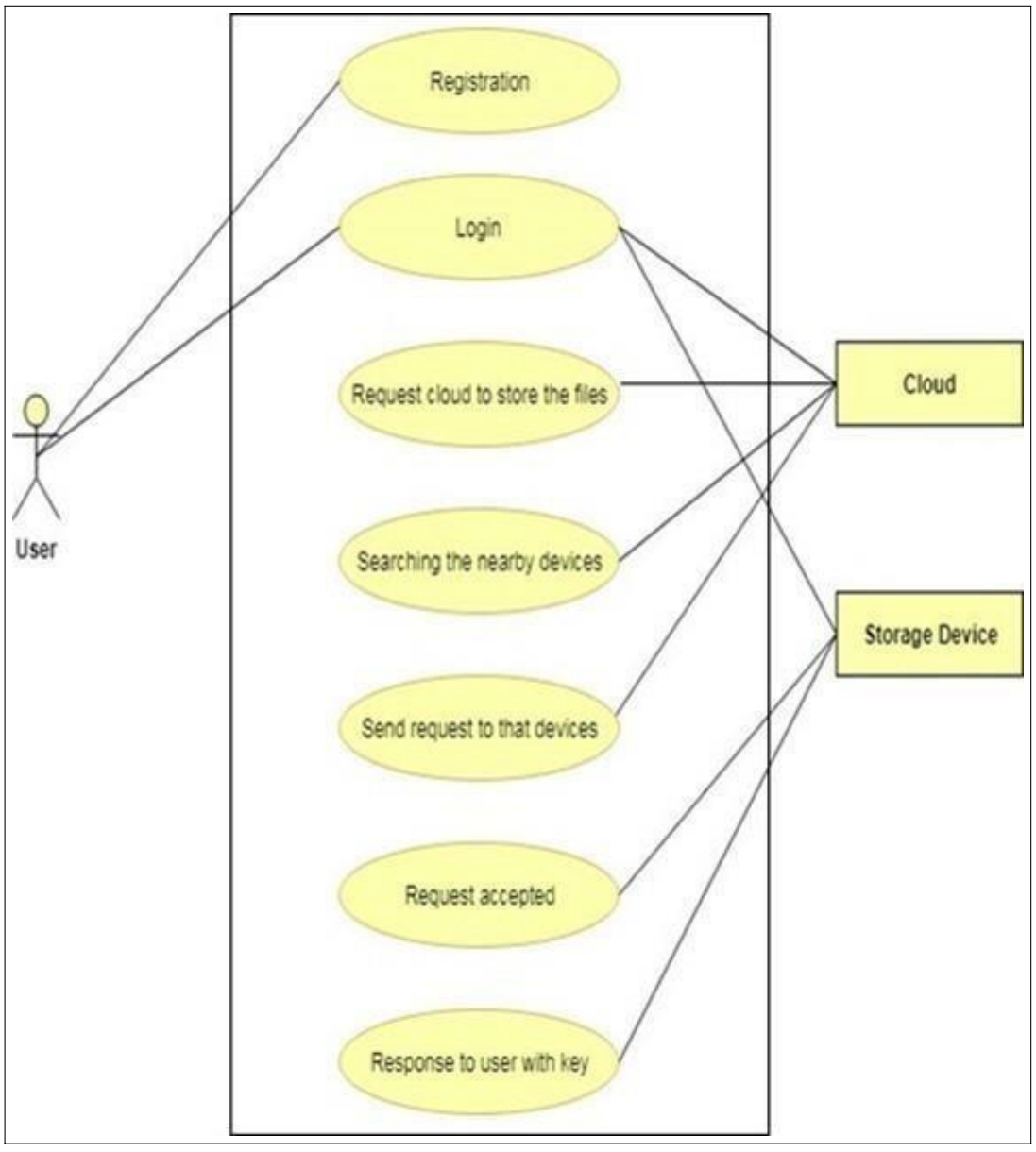


Figure 6.1: Use case diagram

6.3 DATA MODEL AND DESCRIPTION

6.3.1 Data Description

Data objects that will be managed/manipulated by the software are described in this section. The database entities or files or data structures required to be described. For data objects details can be given as below

6.3.2 Data objects and Relationships

Data objects and their major attributes and relationships among data objects are described using an ERD- like form.

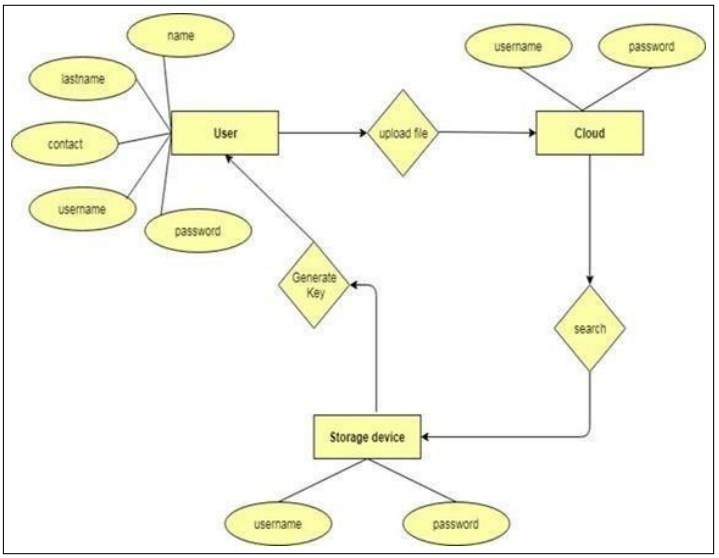


Figure 6.2: ER diagram

6.4 FUNCTIONAL MODEL AND DESCRIPTION

Performance Requirement

(a) Performance of the functions and every module must be well.

(b) The overall performance of the software will enable the users to work Efficiently.

(c) Performance of physical and digital library should be fast.

(d) Performance of the providing virtual environment should be fast.

Safety Requirement

The application is designed in modules where errors can be detected and fixed easily. This makes it easier to install and update new functionality if required.

Security Requirement

All data will be stored in database

6.4.1 Data Flow Diagram

6.4.1.1 Level 0 Data Flow Diagram

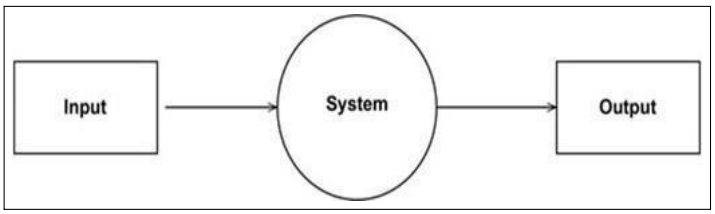


Figure 6.3: DFD Level 0 diagram

6.4.1.2 Level 1 Data Flow Diagram

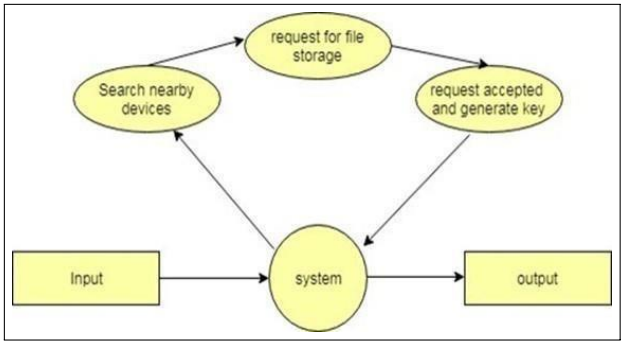


Figure 6.4: DFD Level 1 diagram

6.4.2 Description of functions

A description of each software function is presented. A processing narrative for function n is presented.(Steps)/ Activity Diagrams. For Example Refer 6.5

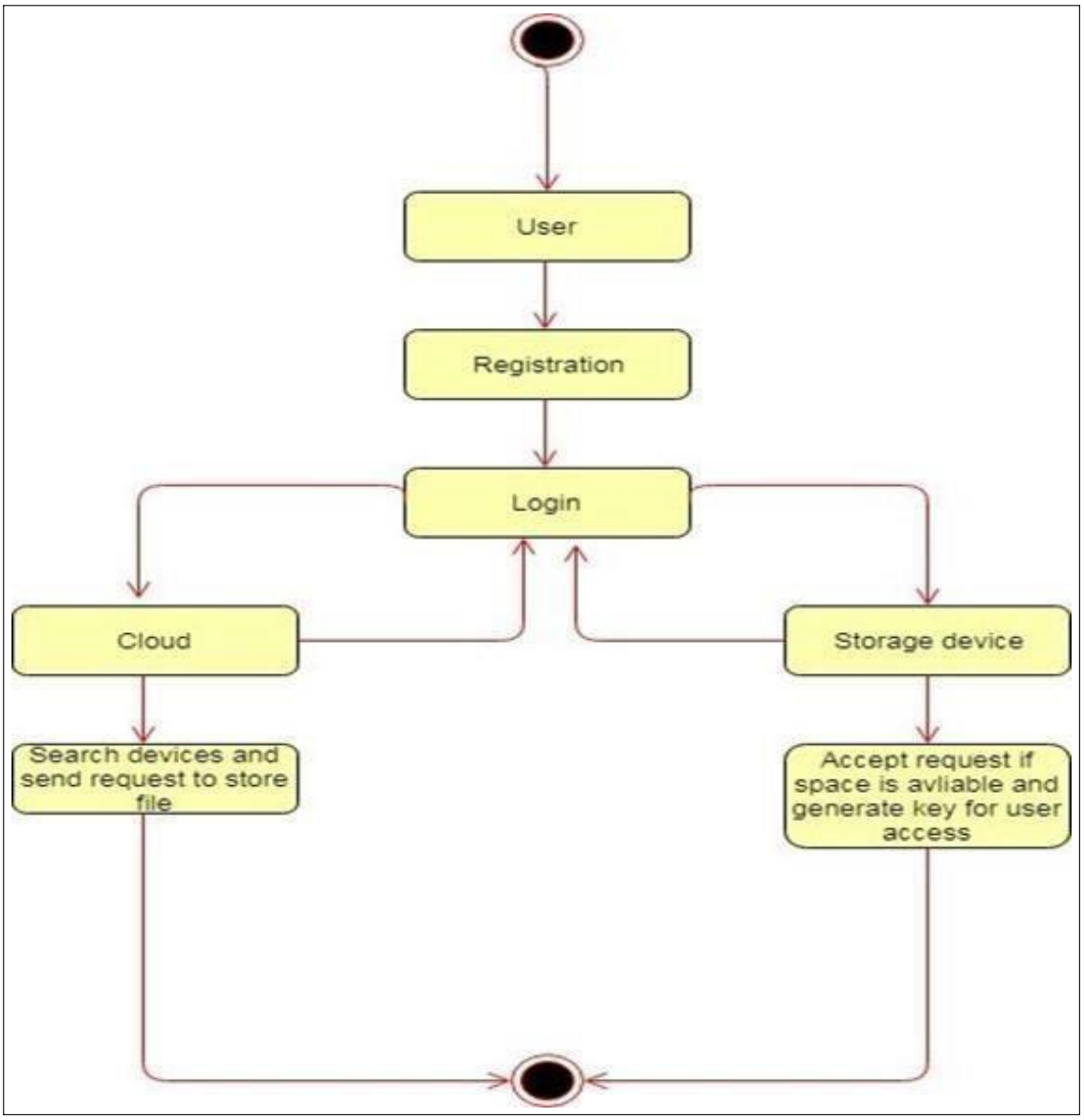


Figure 6.5: Activity diagram

6.4.3 Activity Diagram:

- The Activity diagram represents the steps taken.

6.4.4 Non Functional Requirements:

- Interface Requirements
- Performance Requirements

  System can produce results faster on 4GB of RAM.
- It may take more time for peak loads at main node.
- The system will be available 100% of the time. Once there is a fatal

Error, the system will provide understandable feed back to the user.

- Software quality attributes

  The system considers following non-functional requirements to provide better functionalities and usage of system. 1. Availability: The system shall be available during 24 hours of a day.

  2.Usability: The system is designed keeping in mind the usability issues considering the end-users who are developers/programmers. It provides detailed help which would lead to better and faster learning. Navigation of system is easy.

  3.Consistency: Uniformity in layout, screens, Menus, colours scheme, format.

  4.Performance: The performance of the system should be fast and as per user requirement. From this system we will get expected outcome in less time and less space since efficiency is higher. Speed is totally depending on the response of the database and connection type.

  5.Extendibility: Prevention in the system should be done in the system by which we make changes in the system later on.

  6.Reusability: Files of any type can be used by the system for any number of times during transformation.

  7.Reliability: Protection of data from malicious attack or unauthorized access.

  8.Security: The system provides security to the randomly generated private key by performing encryption to it for encrypting patient data and thus protects from other nodes in the network.

  The network is free from malicious node and misbehaving node attacks. 9.

  Reliability: Our system can provide user an efficient search each time.

  So the user can reliable on the system.

  Because system can guarantee user to provide his/her interested data every time in least amount of time.

6.4.5 State Diagram:

State Transition Diagram

Fig.6.6 example shows the state transition diagram of Cloud SDK. The states are represented in ovals and state of system gets changed when certain events occur. The transitions from one state to the other are represented by arrows. The Figure shows important states and events that occur while creating new project.

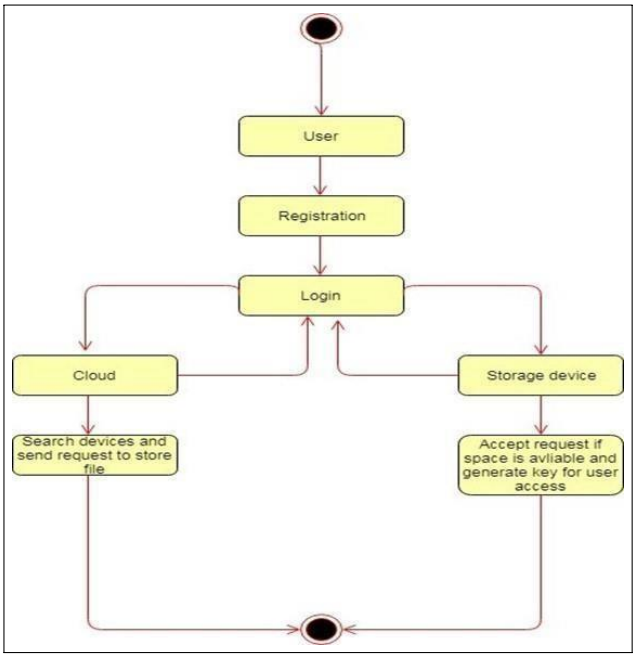


Figure 6.6: State transition diagram

6.4.6 Design Constraints

Any design constraints that will impact the subsystem are noted.

6.4.7 Software Interface Description

1. Eclipse:

- Eclipse is an open source community whose projects building tools and frameworks are used for creating general purpose application. The most popular usage of Eclipse is as a Java development environment.

- Eclipse is an open source community, whose projects are focused on building an open development platform comprised of extensible frameworks, tools and runtimes for building, deploying and managing software across the lifecycle. The Eclipse Foundation is a not-for-profit, member supported corporation that hosts the Eclipse projects and helps cultivate both an open source community and an ecosystem of complementary products and services.
- The Eclipse Project was originally created by IBM in November 2001 and supported by a consortium of software vendors. The Eclipse Foundation was created in January 2004 as an independent not-for-profit corporation to act as the steward of the Eclipse community. The independent not-forprofit corporation was created to allow a vendor neutral and open, transparent community to be established around Eclipse. Today, the Eclipse community consists of individuals and organizations from a cross section of the software industry.

Feature Highlights

JDK 7

- Project Coin support
- Editor enhancements: Code completion, hints

MYSQL Database

- Simplified connection wizard
- Guided installation to JDBC driver
- Editing and deployment of stored procedures

2. 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.

CHAPTER 7

DETAILED DESIGN DOCUMENT USING APPENDIX A AND B

7.1 INTRODUCTION

This document specifies the design that is used to solve the problem of Product.

7.2 ARCHITECTURAL DESIGN

A description of the program architecture is presented. Subsystem design or Block diagram, Package Diagram, Deployment diagram with description is to be presented.

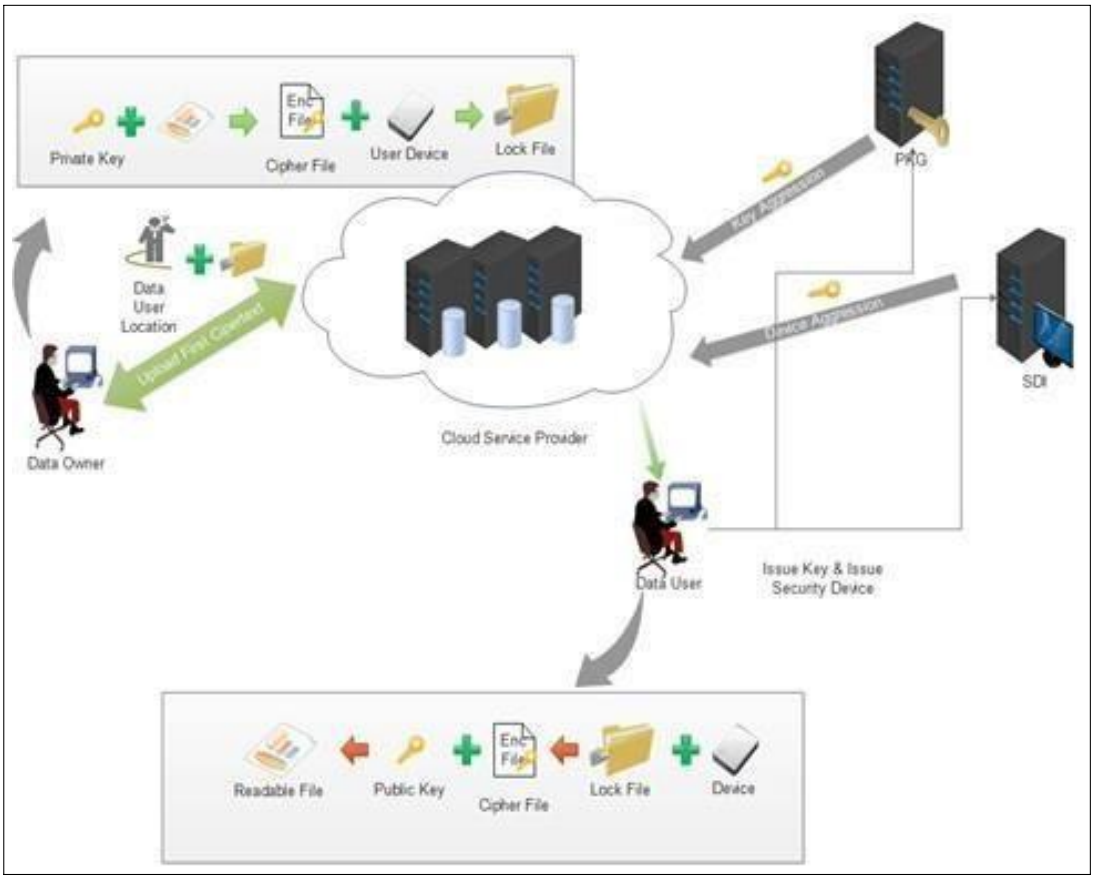


Figure 7.1: Architecture diagram

7.3 DATA DESIGN (USING APPENDICES A AND B)

A description of all data structures including internal, global, and temporary data structures, database design (tables), file formats.

7.3.1 Internal software data structure

Data structures that are passed among components the software are described.

7.3.2 Global data structure

Data structured that are available to major portions of the architecture are described.

7.3.3 Temporary data structure

Files created for interim use are described.

7.3.4 Database description

Database(s) / Files created/used as part of the application is(are) described.

7.4 COMPOENT DESIGN

Class diagrams, Interaction Diagrams, Algorithms. Description of each component description required.

7.4.1 Class Diagram

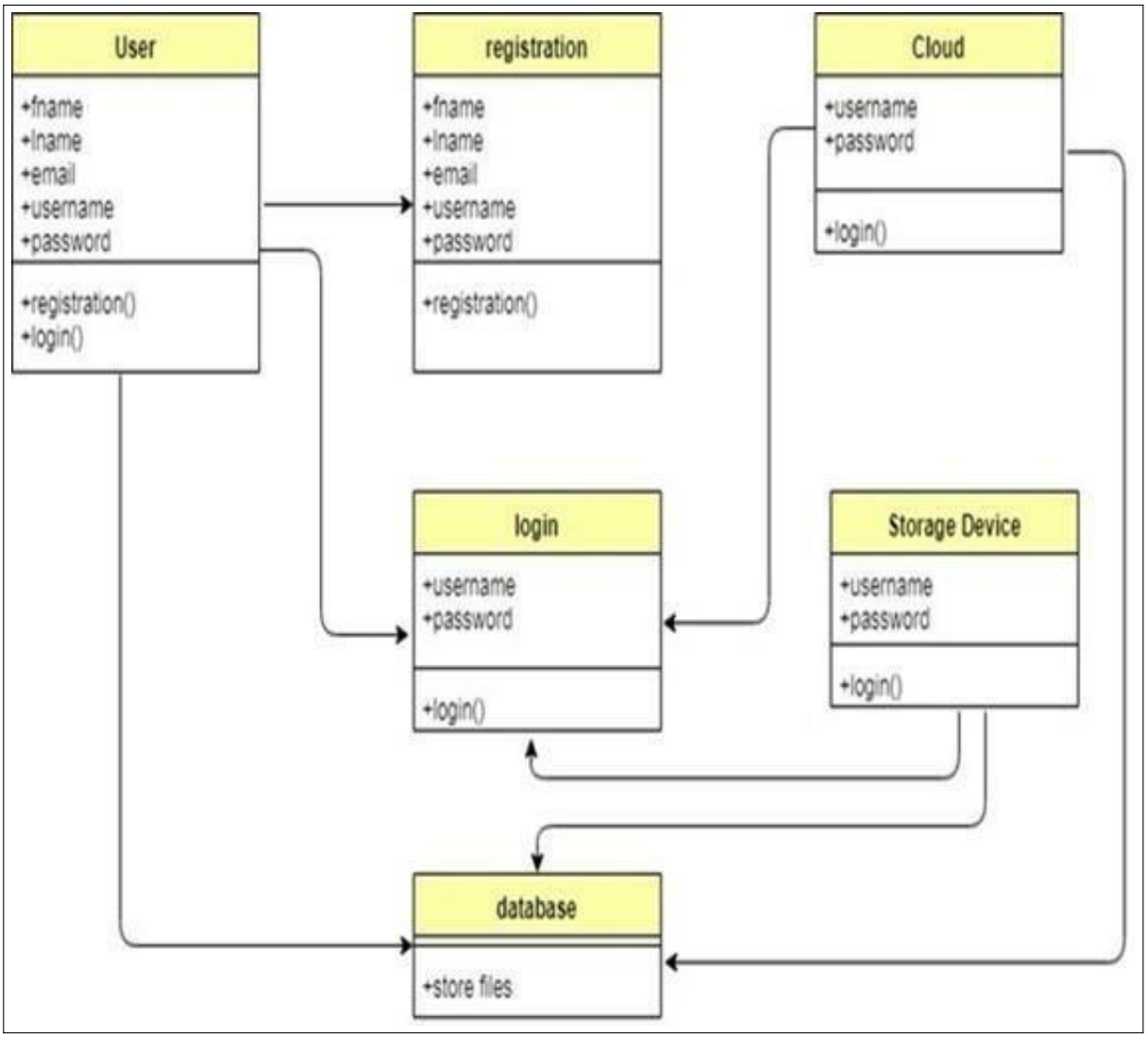
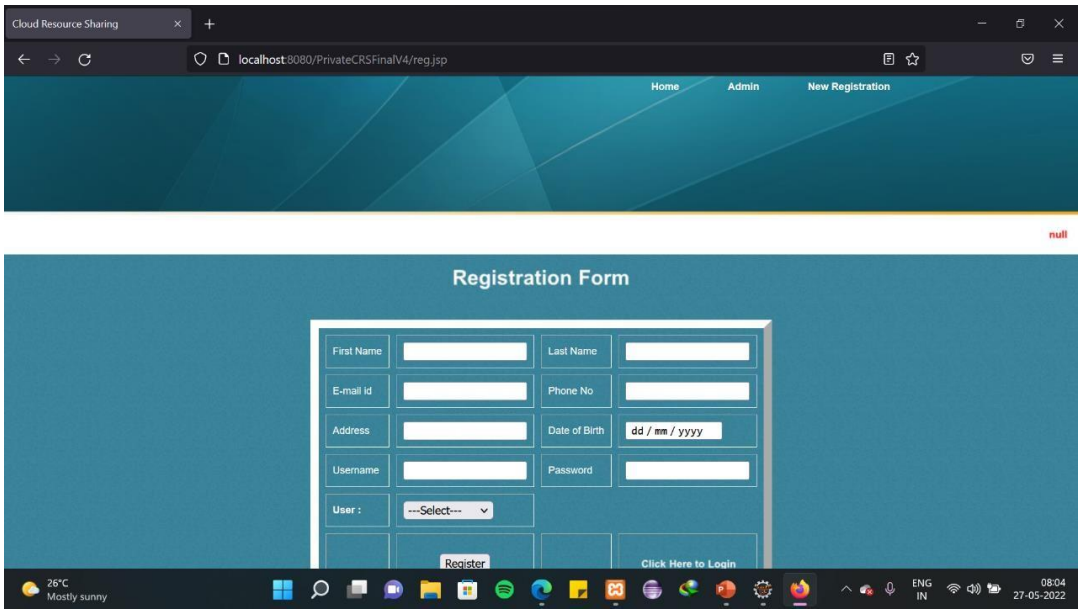
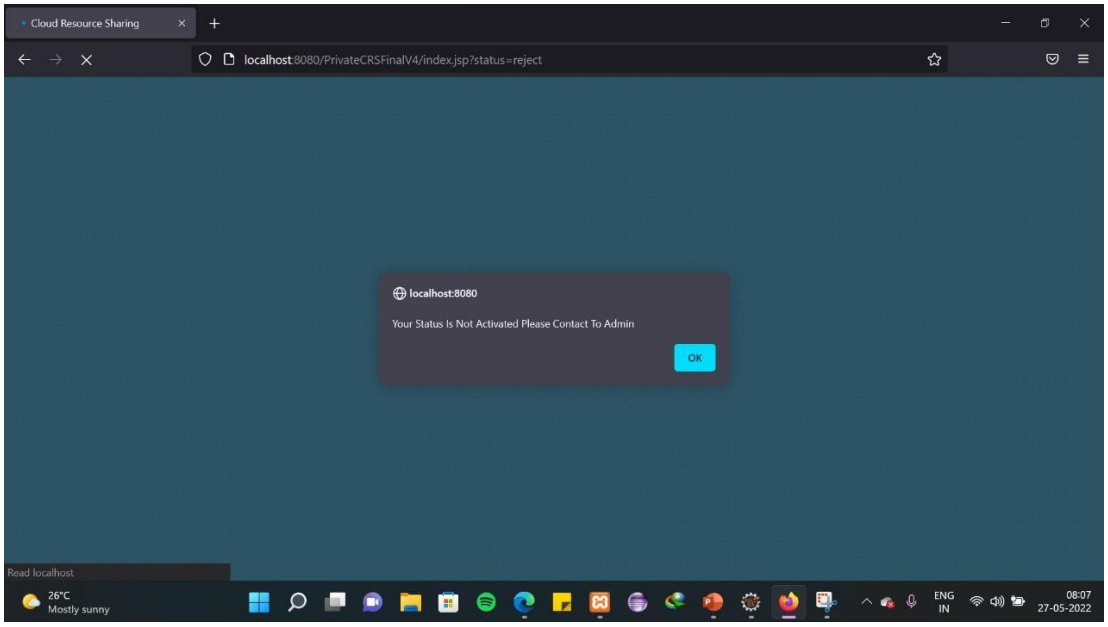
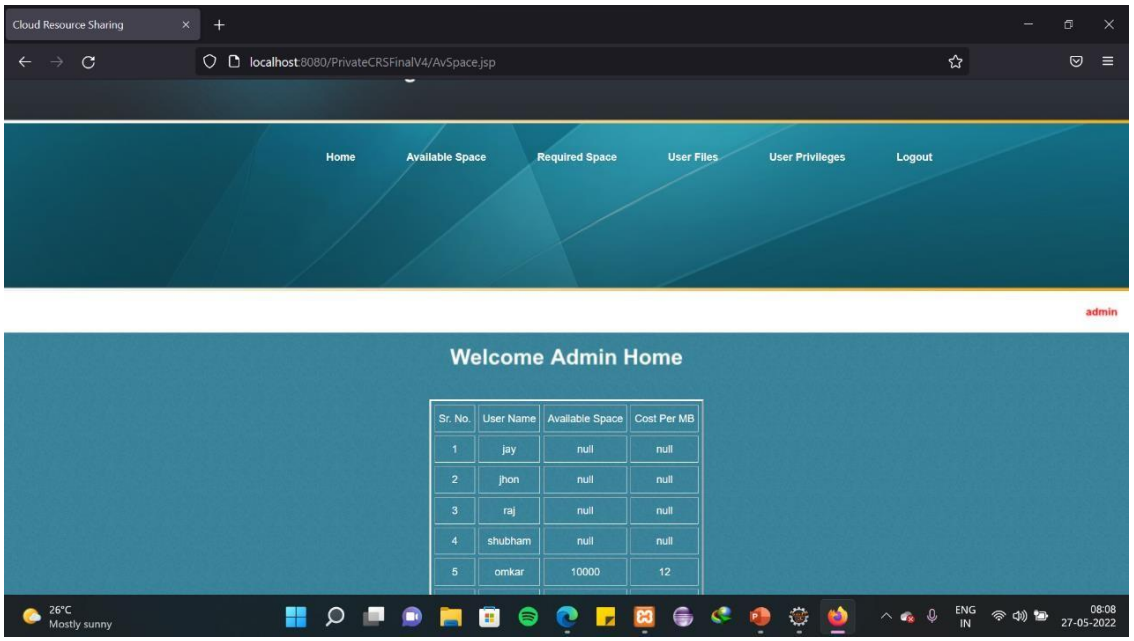


Figure 7.2: Class Diagram

CHAPTER 8: Result (Screen Shot)



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Available Space
Required Space
User Files
User Privileges
Logout
admin
Welcome Admin Home
Sr. No. | User Name | Available Space | Cost Per MB
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2 | jhon | null | null
3 | raj | null | null
4 | shubham | null | null
5 | omkar | 10000 | 12
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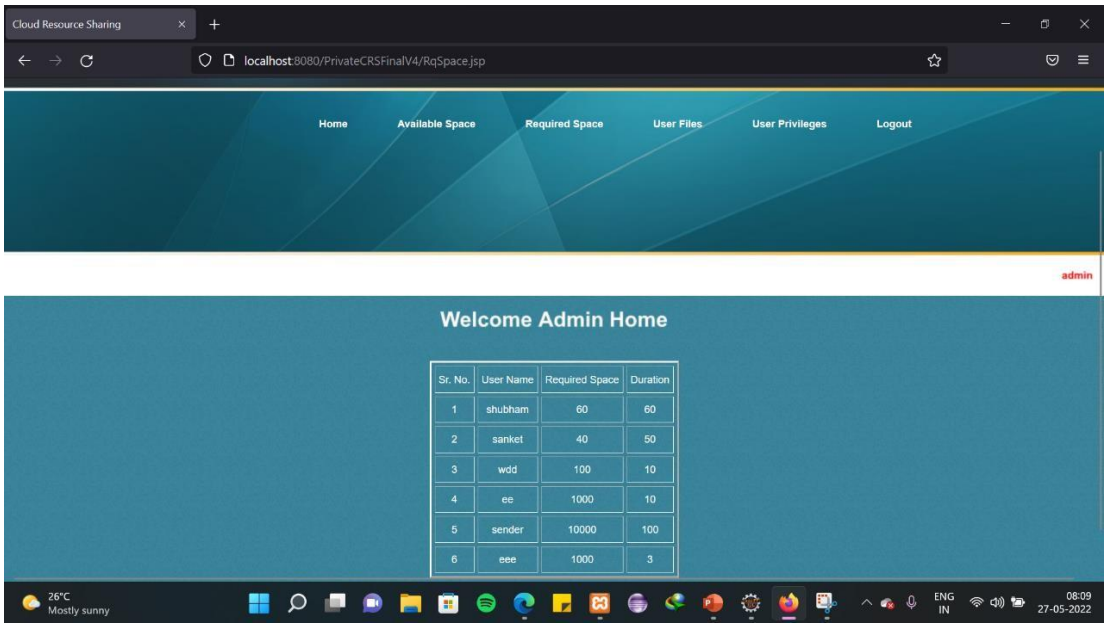
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Required Space
User Files
User Privileges
Logout
admin
Welcome Admin Home
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2 | sanket | 40 | 50
3 | wdd | 100 | 10
4 | ee | 1000 | 10
5 | sender | 10000 | 100
6 | eee | 1000 | 3
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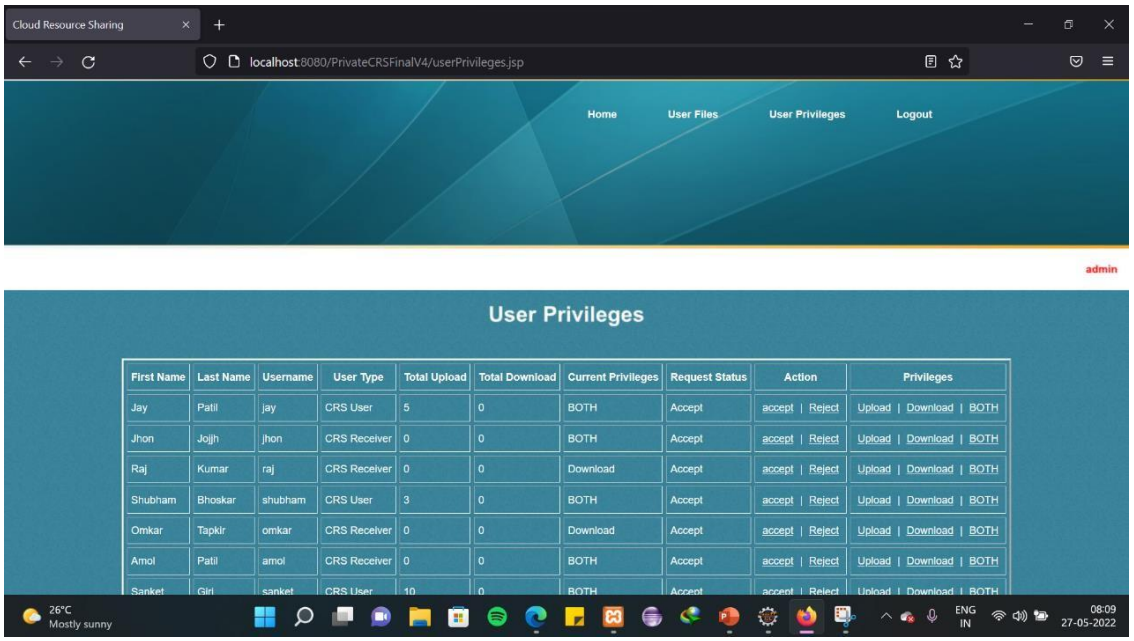
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Jhon | Jojjh | jhon | CRS Receiver | 0 | 0 | BOTH | Accept | accept | Reject | Upload | Download | BOTH
Raj | Kumar | raj | CRS Receiver | 0 | 0 | Download | Accept | accept | Reject | Upload | Download | BOTH
Shubham | Bhoskar | shubham | CRS User | 3 | 0 | BOTH | Accept | accept | Reject | Upload | Download | BOTH
Omkar | Tapkir | omkar | CRS Receiver | 0 | 0 | Download | Accept | accept | Reject | Upload | Download | BOTH
Amol | Patil | amol | CRS Receiver | 0 | 0 | BOTH | Accept | accept | Reject | Upload | Download | BOTH
Sanket | Giri | sanket | CRS User | 10 | 0 | BOTH | Accept | accept | Reject | Upload | Download | BOTH
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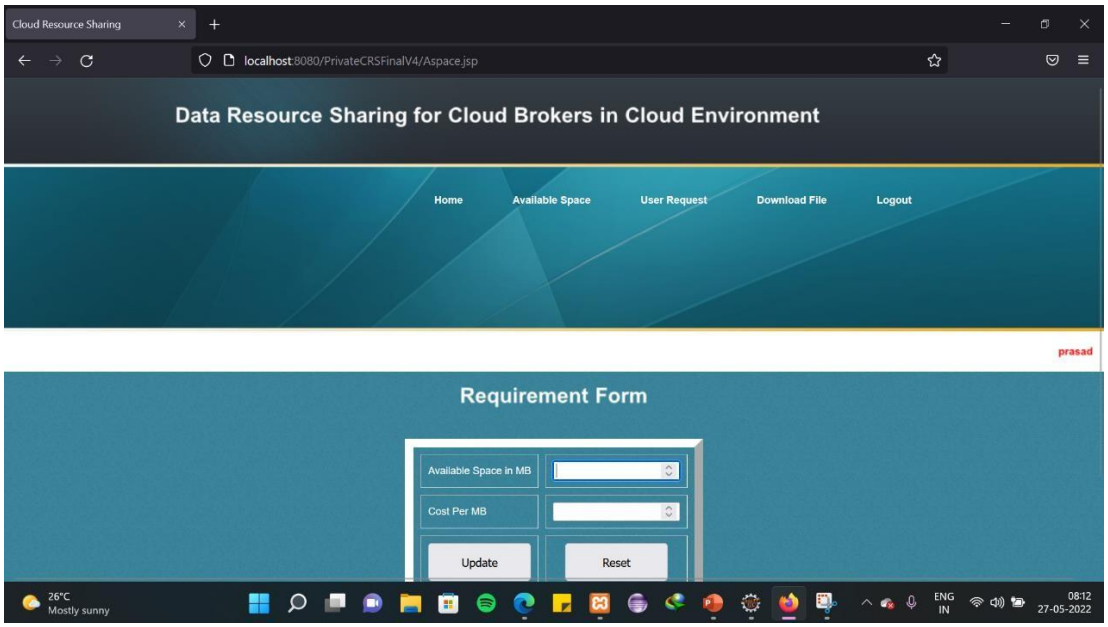
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User Request
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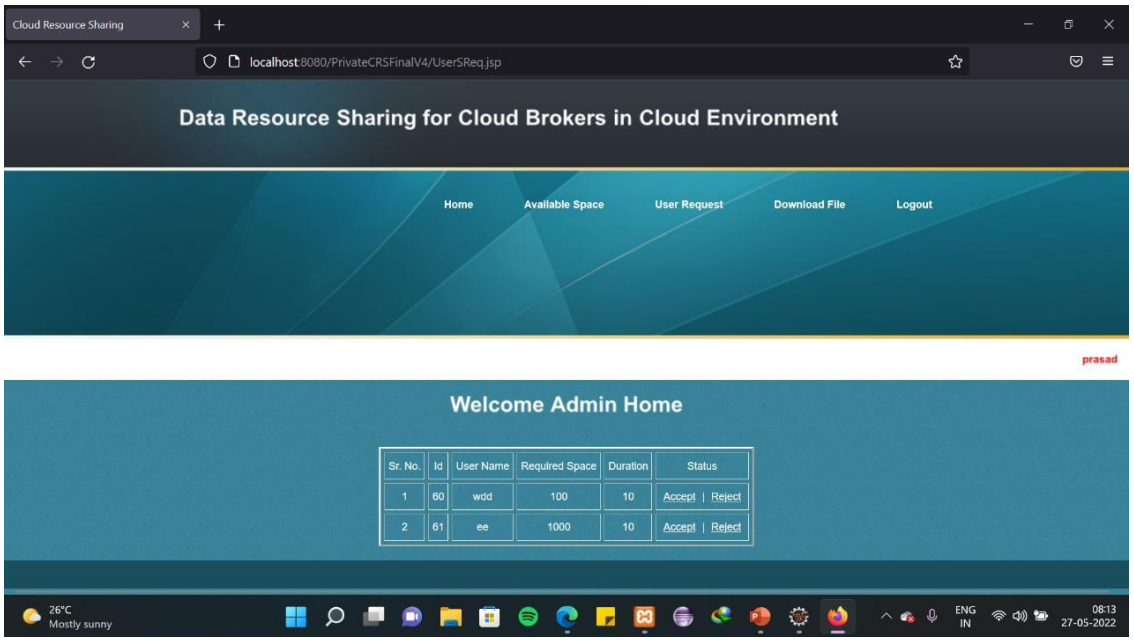
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Sr. No.
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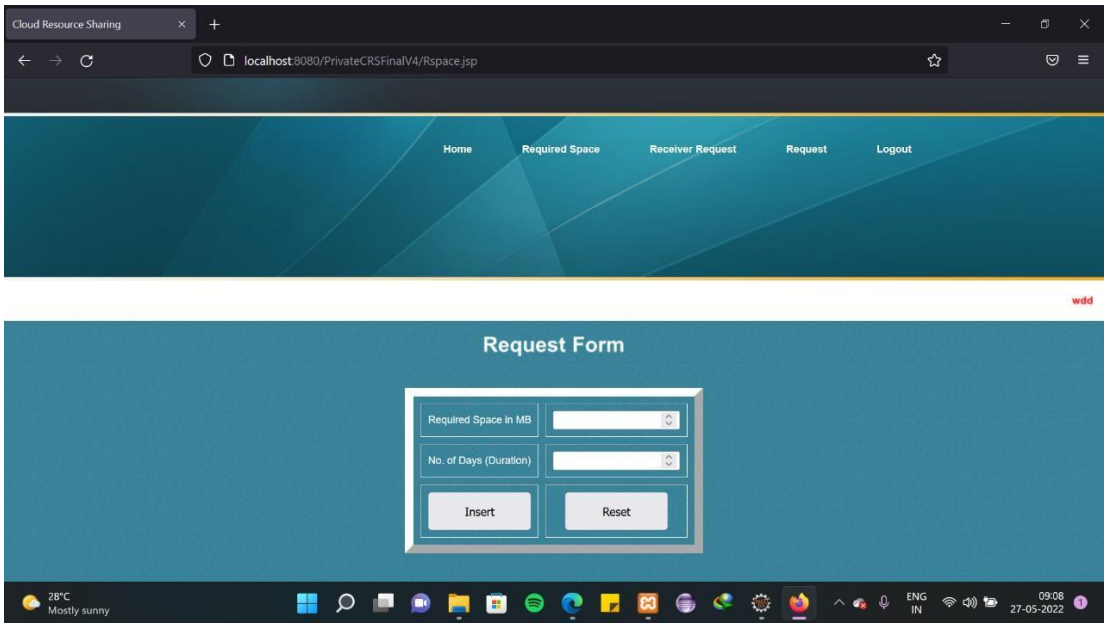
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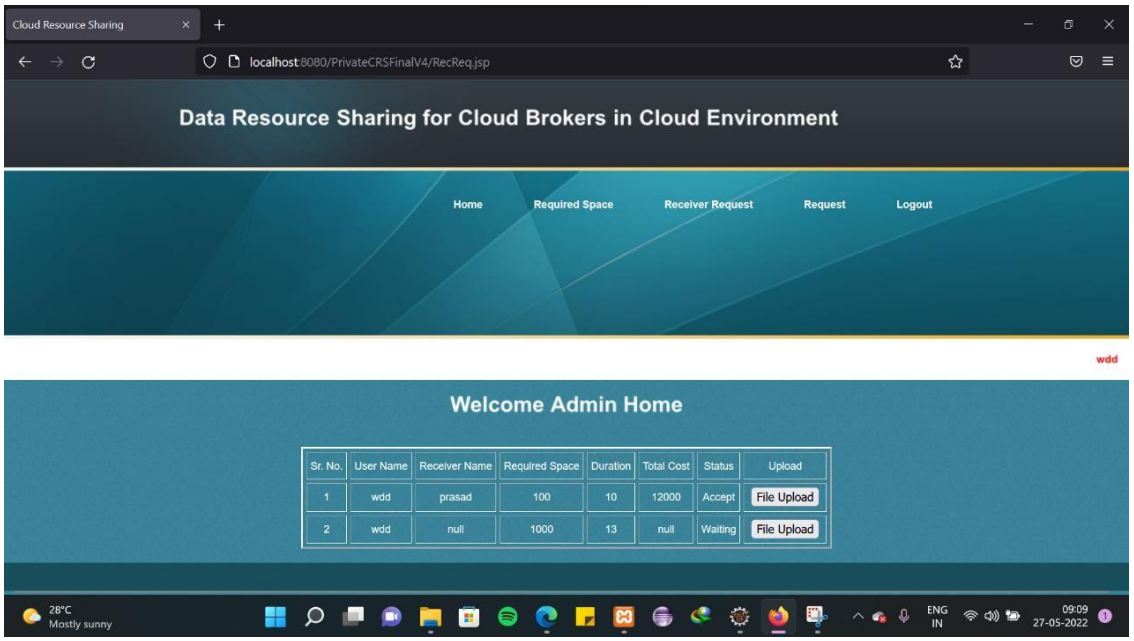
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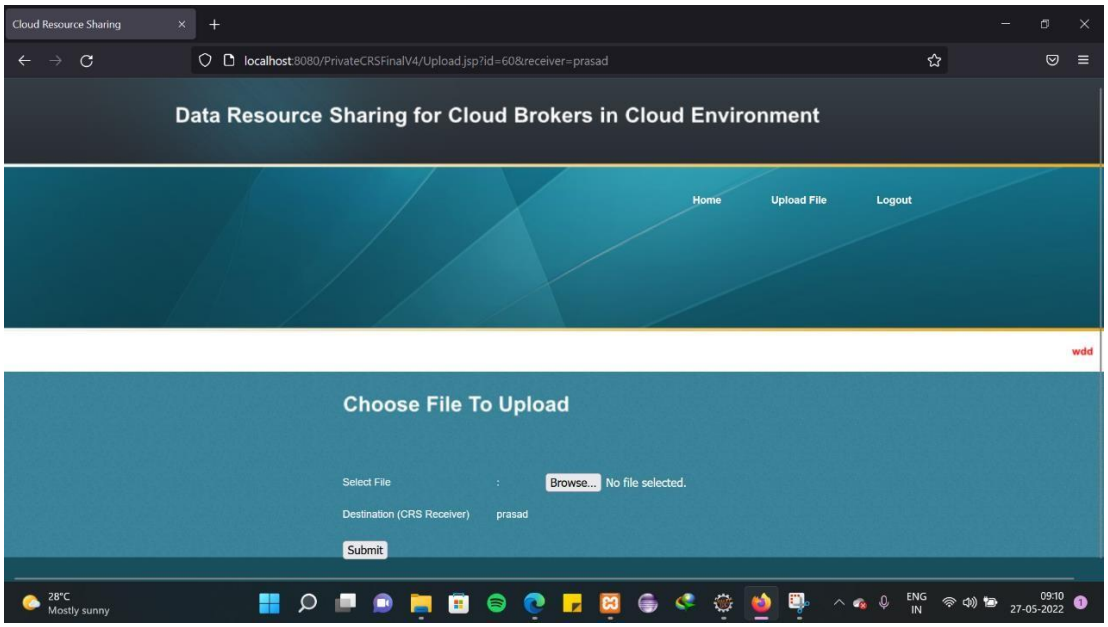
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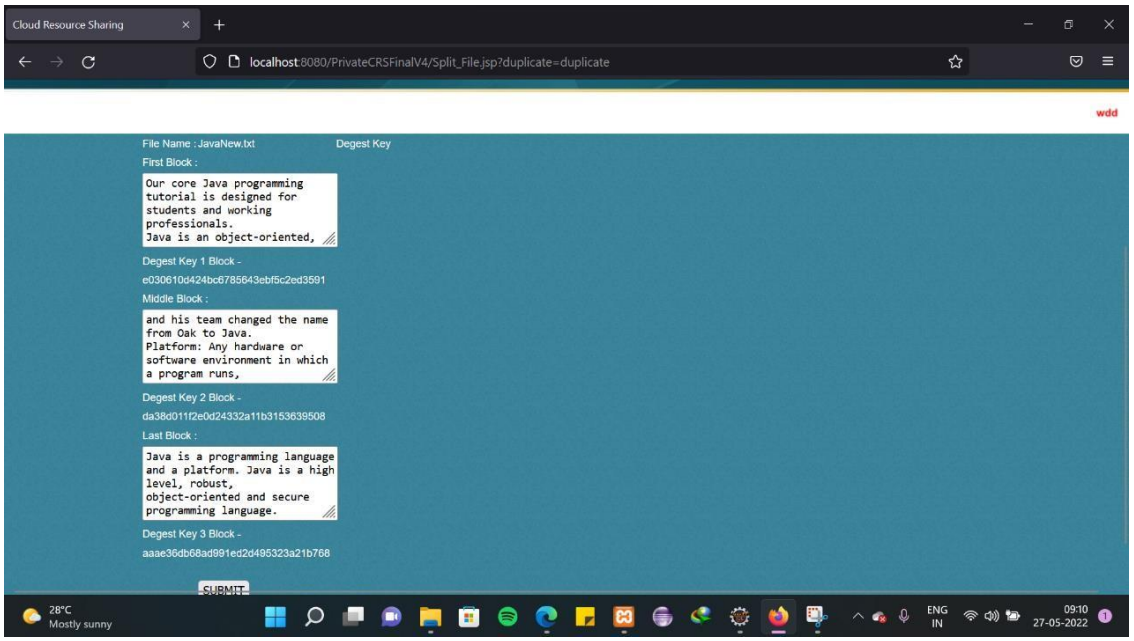
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Java is an object-oriented,
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Middle Block :
and his team changed the name from Oak to Java.
Platform: Any hardware or software environment in which a program runs,
Degest Key 2 Block -
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Last Block :
Java is a programming language and a platform. Java is a high level, robust,
object-oriented and secure programming language.
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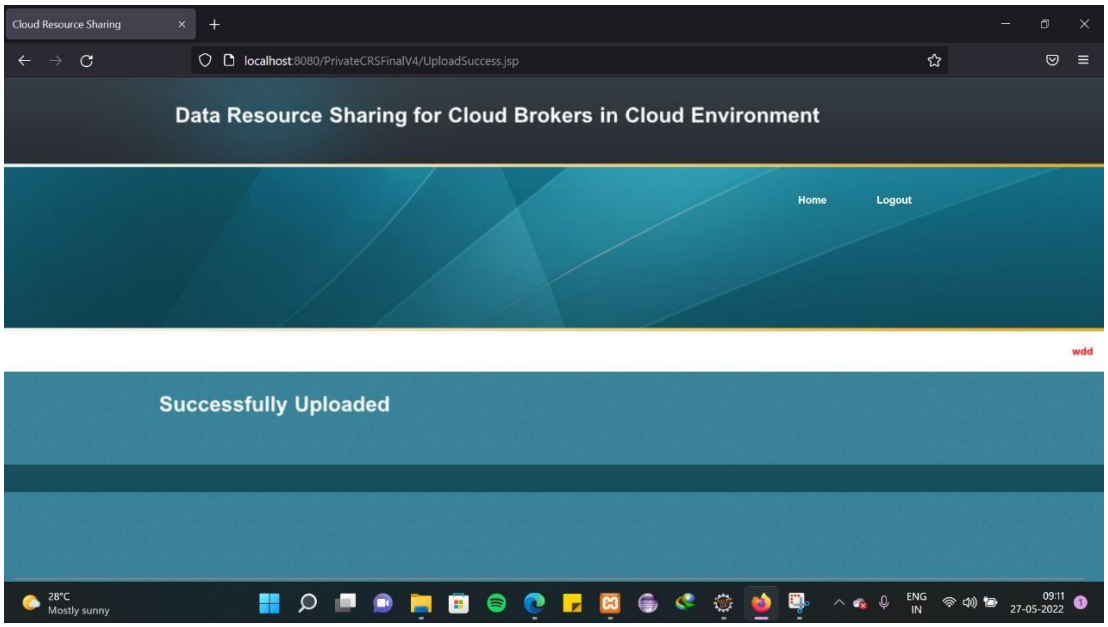
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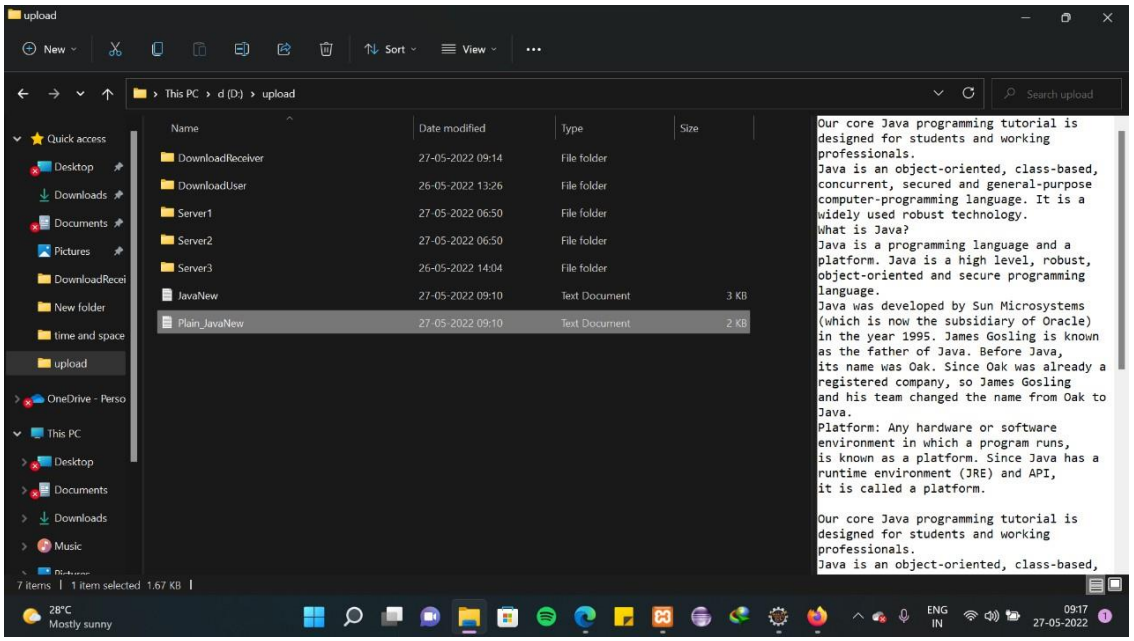
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Plain_JavaNew 27-05-2022 09:10 Text Document 2 KB
Our core Java programming tutorial is designed for students and working professionals.
Java is an object-oriented, class-based, concurrent, secured and general-purpose computer-programming language. It is a widely used robust technology.
What is Java?
Java is a programming language and a platform. Java is a high level, robust, object-oriented and secure programming language.
Java was developed by Sun Microsystems (which is now the subsidiary of Oracle) in the year 1995. James Gosling is known as the father of Java. Before Java, its name was Oak. Since Oak was already a registered company, so James Gosling and his team changed the name from Oak to Java.
Platform: Any hardware or software environment in which a program runs, is known as a platform. Since Java has a runtime environment (JRE) and API, it is called a platform.
Our core Java programming tutorial is designed for students and working professionals.
Java is an object-oriented, class-based,
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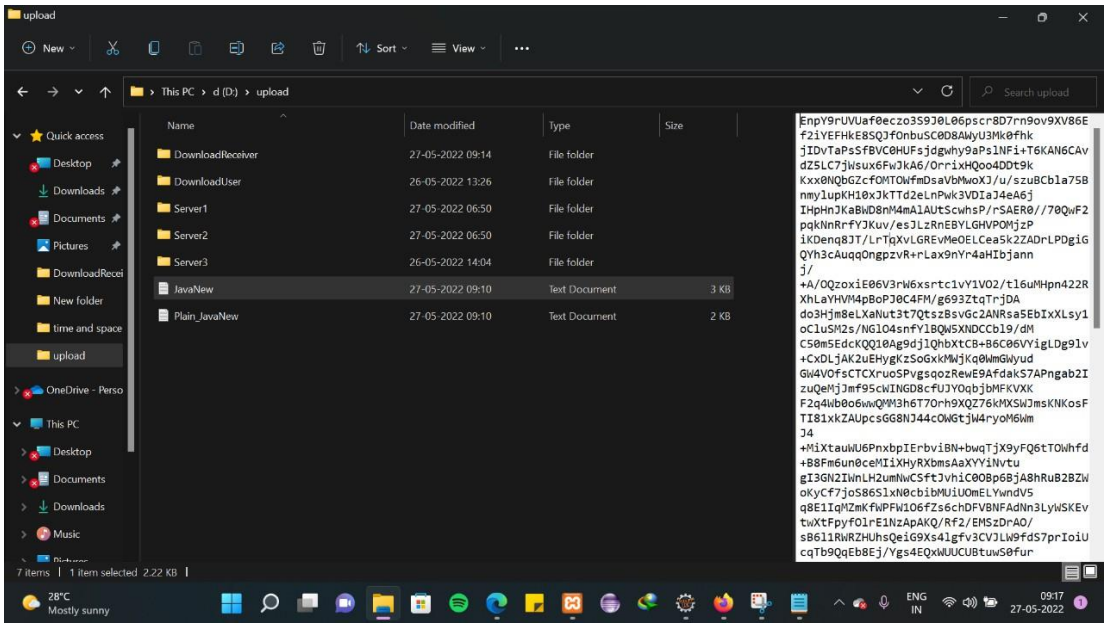
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7 items | 1 item selected 2.22 KB
28°C
Mostly sunny
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CHAPTER 9 SUMMARY AND

CONCLUSION

Cloud computing is an emerging shared infrastructure. It is automatically formed from a virtual resource pool via the network and a large number of virtual technology available resources. The ability of integration crossing regional and cross database resource is breaking the distributed data resources. It would cause the imbalance information but in another hand it also improves the effective of circulation and utilization of resources. This paper summarizes the study of distance education at home and abroad on the basis of resource sharing with the open source IaaS project and OpenStack to propose a model base on cloud computing to making a distance education resources sharing system. The model was finished at all levels of design and implementation.

CHAPTER 10 REFERENCES

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ANNEXURE A

LABORATORY ASSIGNMENTS ON PROJECT ANALYSIS OF ALGORITHMIC DESIGN

- To develop the problem under consideration and justify feasibility using concepts of knowledge canvas and IDEA Matrix.

  Refer [2] for IDEA Matrix and Knowledge canvas model. Case studies are given in this book. IDEA Matrix is represented in the following form. Knowledge canvas represents about identification of opportunity for product. Feasibility is represented w.r.t. business perspective.

I	D	E	A
Increase	Drive	Educate	Accelerate
Improve	Deliver	Evaluate	Associate
Ignore	Decrease	Eliminate	Avoid

Table A.1: IDEA Matrix

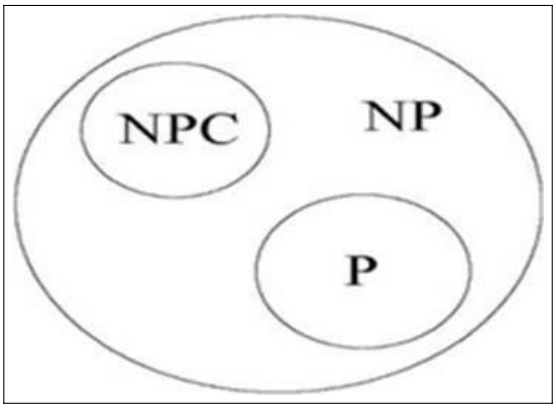
- Project problem statement feasibility assessment using NP-Hard, NP Complete or satisfy ability issues using modern algebra and/or relevant mathematical models.

- Input x output y, y=f(x) When solving problems we have to decide the difficulty level of our problem. There are three types of classes provided for that. These are as follows

P Class

NP hard Class

NP Complete Class



NP-hard:

- A lot of times to solve the problem by reducing it to a different problem.
- Reducing the Problem B to Problem A if given a solution to Problem A, it can easily construct a solution to Problem B. (In this case, ”easily” means ”in polynomial time.”) If a problem is NP-hard, this means reduce any problem in NP to that problem. This means easily solve any problem in NP.
- If solve an NP-hard problem in polynomial time, this would prove P = NP. To solve the existing problem by reducing it to a different problem. For e.g. the existing system is having problem time and speed. Suppose reduce problem of time by using another method to reduce the time problem. So that It can easily construct another solution to the existing problem. This means this problem is NP-Hard.
- NP-Complete :
- A technical point: O (n) actually means the algorithm runs in asymptotically linear time, which means the time complexity approaches a line as n gets very large. Also, O (n) is technically an upper bound, so if the algorithm ran in sub linear time it could be still say it’s O (n), even if that’s not the best description of it. Note that if the input has many different parameters, like n and k, it might be polynomial in n and exponential in k Per Xuan Luo’s comment, deterministic and nondeterministic Turing machines can compute exactly the same things, since every nondeterministic Turing ma- chine can be simulated by a deterministic Turing machine (a “regular com- putter”). However, they may compute things in different amounts of time.

ANNEXURE B

LABORATORY ASSIGNMENTS ON PROJECT QUALITY AND RELIABILITY TESTING OF PROJECT DESIGN

It should include assignments such as

- Use of divide and conquer strategies to exploit distributed/parallel/concurrent processing of the above to identify object, morphisms, overloading in functions (if any), and functional relations and any other dependencies (as per requirements). It can include Venn diagram, state diagram, function relations, i/o relations; use this to derive objects, morphism, overloading
- Use of above to draw functional dependency graphs and relevant Software modelling methods, techniques including UML diagrams or other necessities using appropriate tools.
- Testing of project problem statement using generated test data (using mathematical models, GUI, Function testing principles, if any) selection and appropriate use of testing tools, testing of UML diagram's reliability. Write also test cases [Black box testing] for each identified functions. You can use Mathematica or equivalent open source tool for generating Test data. Additional assignments by the guide.

ANNEXURE C

REVIEWERS COMMENTS OF PAPER SUBMITTED

(At-least one technical paper must be submitted in Term-I on the project design in the conferences/workshops in IITs, Central Universities or UoP Conferences or equivalent International Conferences Sponsored by IEEE/ACM)

(a) Paper Title:

(b) Name of the Conference/Journal where paper submitted :

(c) Paper accepted/rejected :

(d) Review comments by reviewer :

(e) Corrective actions if any :

ANNEXURE D

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