

ACADEMIC GURU

*A Mini Project-1 Report submitted
in partial fulfilment of the requirements
for the award of the degree of*

BACHELOR OF TECHNOLOGY

In

COMPUTER SCIENCE & ENGINEERING

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CERTIFICATE

*This is to certify that the Mini Project-1 entitled "**ACADEMIC GURU**", is being submitted by **P.UMADEVI, P.VEEKSHITA, Y.LAASIKA, K.LAKSHMI PRASANNA, K.V.M. MADHURI** bearing the **Regd. No. 18B01A05B0, 18B01A0580, 18B01A0588, 19B05A0512, 19B05A0511** in partial fulfilment of the requirements for the award of the degree of "**Bachelor of Technology in Computer Science & Engineering**" is a record of bonafide work carried out by them under my guidance and supervision during the academic year 2019–2020 and it has been found worthy of acceptance according to the requirements of the university.*

Internal Guide

Head of the Department

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ABSTRACT

Students are facing much inconvenience to get their doubts clarified or to collect pre-requisites and get prepared for any opportunities accordingly. There are many students who want to know the requirements to attend a workshop, tips or suggestions for exams, pre requirements for any training programs being conducted etc.

To clear the doubtful mind, we came up with a "STUDENT FORUM" where ideas and doubts are exchanged and clarified respectively. It is a Web Application where students and faculty get registered. Anyone at any point of time can post their queries in the forum. Faculty registered or senior students or peers can answer the questions posted. The queries and their answers are viewed by everyone but the chance to post a query or reply to an answer is only for registered users. The platform is for academic purposes only.

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1. INTRODUCTION:

Students are facing much inconvenience to get their doubts clarified or to collect pre-requisites and get prepared for any opportunities accordingly. There are many students who want to know the requirements to attend a workshop, tips or suggestions for exams, pre requirements for any training programs being conducted etc.

To clear the doubtful mind, we came up with a "**STUDENT FORUM**" where ideas and doubts are exchanged and clarified respectively. It is a Web Application where students and faculty get registered. Anyone at any point of time can post their queries in the forum. Faculty registered or senior students or peers can answer the questions posted. The queries and their answers are viewed by everyone but the chance to post a query or reply to an answer is only for registered users. The platform is for academic purposes only.

In our forum registered user can access the web page, user is able to see the queries and respective solutions for the particular queries posted by faculty members, seniors and their peers, but if the user want to post a query or wants to answer the query then he/she should register by giving their respective credentials like First Name, Last Name, User Name, Mail Id, Password to the web page by choosing their respective identity either student or faculty.

If the user is already registered by giving respective credentials to the webpage then user can see a navigation part in the page like,

Menu: This shows four categories where the user needs to select one among them to get related queries and their answers.

Home: This redirects to the Homepage of the user where queries of all categories are seen along with their answers.

Ask: In this, the user can post his/her query.

User info: In this users are able to see their personal information like First Name, Last Name, User Name, Password. If a user wants to make any changes he/she can change and click the Save changes option.

2. SYSTEM ANALYSIS:

2.1 Existing system:

- **"STUDENT EDGE"** is one such platform that works as a Forum all over the world. It is collaborated with many schools and colleges where students can find jobs, make career decisions etc.
- This platform is open for all type of communities where it involves all fields like Education, Jobs, Movies, Cooking, Games etc.
- But this is not suitable for a place like college where both Students and Faculty get involved. And also, this is not confined particularly to a college or a school.
- Student Edge contains, all articles and reviews about Movies, Music, News, Sports etc.
- In student edge any one can access and register into the page and post any type of query either it related to education or it related to entertainment or any other field.
- In Student edge we may interact with many people, it is a worldwide forum different people post different queries based on their respective fields.
- If the user wants to post a query, then he/she should register to get a chance to post a query or answer a query posted by others.
- Without registering we are only able to see the queries posted and respective solutions for them answered by others.
- Student edge also provides online courses where we can select and learn.
- Student Edge delivers digital online courses that helps us to navigate every day challenges. They conduct some quizzes while learning the courses. After completing the course, the user will receive a certificate regarding that particular course.
- They offer courses like Cyber security, Job Readiness, Particular advice on preparing for your first job etc.

2.2 Proposed System

- The main aim of this project is to have a Student Forum for our institution where Students and Faculty can have their discussions and idea exchanges.
- This provides a better way for Students to approach Faculty and clear their doubts. People can post their queries and answers in the Forum.
- This project involves Java to get a good look and feel Graphical User Interface (GUI) and Advanced Java to connect it to Database and HTML.
- This project includes various keynotes like Workshops, Training programs, Recruitments etc., where the queries and their answers are listed accordingly.
- The user is able to post the query or answer the query posted by others only when he/she registered into the website.
- The user can post their query and the solution was given by their respective faculty, seniors, or peers.
- The forum is only for academic purpose means the posted query must relate to education.

2.3 Feasibility Study:

Generally, the feasibility study is used for determining the resource cost, benefits and whether the proposed system is feasible with respect to the organization. The proposed system feasibility could be as follows:

- Technical Feasibility
- Economic Feasibility
- Behavioural Feasibility

Technical Feasibility:

Technical feasibility deals with the existing technology, software and hardware requirements for the proposed system. The proposed system "STUDENT FORUM" is planned to run on java. Thus, the project is considered technically feasible for the development. The work for the project can be done with current equipment, existing software technology and available personnel. Hence the proposed system is technically feasible.

Economic Feasibility

This method is most frequently used for evaluating the effectiveness of a java. It is also called as benefit analysis. The project is developed on existing software technology. Since the required hardware and software for developing the system is already available in the organization, it doesn't cost much developing the proposed system.

Behavioural Feasibility

This project has been implemented by java and it satisfies all conditions and norms of the organization and the users. This project has much behavioural feasibility because users are provided with a better facility.

3. SYSTEM REQUIREMENTS SPECIFICATION (SRS)

A SRS is a document which sets out what the client expects and what is expected of the software system which is being developed. It is a mutual agreement and insurance policy between client and developer and is a vital part of the Software Development Lifecycle.

3.1 Software Requirements:

The **software requirements** are descriptions of features and functionalities of the target system. **Requirements** convey the expectations of users from the **software** product. The **requirements** can be obvious or hidden, known or unknown, expected or unexpected from the client's point of view.

- SOFTWARE CONSIDERATIONS:
 1. Java
 2. JDBC (Java Database Connectivity)
 3. HTML (Hypertext Mark-up Language) and CSS
 4. JSP (Java Server Pages)
 5. MySQL
 6. Apache Tomcat Server

3.2 Hardware requirements

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware, a hardware requirements list is often accompanied by a hardware compatibility list (HCL), especially in case of operating systems. An HCL lists tested, compatible, and sometimes incompatible hardware devices for a particular operating system or application. The following subsections discuss the various aspects of hardware requirements.

- HARDWARE CONSIDERATIONS:
 1. RAM: 12GB
 2. Processor: Intel core i5
 3. Hard disk space: 1TB
 4. Operating System: Windows 10

4. SYSTEM DESIGN

4.1 Introduction

System design is the process of designing the elements of a system such as the architecture, modules and components, the different interfaces of those components and the data that goes through that system.

System Analysis is the process that decomposes a system into its component pieces for the purpose of defining how well those components interact to accomplish the set requirements. The purpose of the System Design process is to provide sufficient detailed data and information about the system and its system elements to enable the implementation consistent with architectural entities as defined in models and views of the system architecture.

The purpose of the design phase is to plan a solution of the problem specified by the requirement document. This phase is the first step in moving from the problem domain to the solution domain. The design of a system is perhaps the most critical factor affecting the quality of the software, and has a major impact on the later phases, particularly testing and maintenance. The output of this phase is the design document. This document is similar to a blueprint or plan for the solution, and is used later during implementation, testing and maintenance.

The design activity is often divided into two separate phase-system designs and detailed design. System design, which is sometimes also called top-level design, aims to identify the modules that should be in the system, the specifications of these modules, and how they interact with each other to produce the desired results. At the end of system design all the major data structures, file formats, output formats, as well as the major modules in the system and their specifications are decided.

A design methodology is a systematic approach to creating a design by application of a set of techniques and guidelines. Most methodologies focus on system design. The two basic principles used in any design methodology are problem partitioning and abstraction. A large system cannot be handled as a whole, and so for design it's partitioned into smaller systems. Abstraction is a concept related to problem partitioning. When partitioning is used during design, the design activity focuses on one part of the system at a time. Since the part being designed interacts with other parts of the system, a clear understanding of the interaction is essential for properly designing the part.

4.2 UML Diagrams

USE CASE DIAGRAM:

Use case diagrams consist of actors, use cases and their relationships. The diagram is used to model the system/subsystem of an application. A single use case diagram captures a particular functionality of a system.

1. Functionalities to be represented as use case
2. Actors
3. Relationships among the use cases and actors

In our example the preliminaries are,

ACTORS: Student1, Student 2, Faculty.

USE CASES: Register, Search topic, Search question, Gets answer, Login, Posts query, Answer query, Query gets clarified, Hits like option.

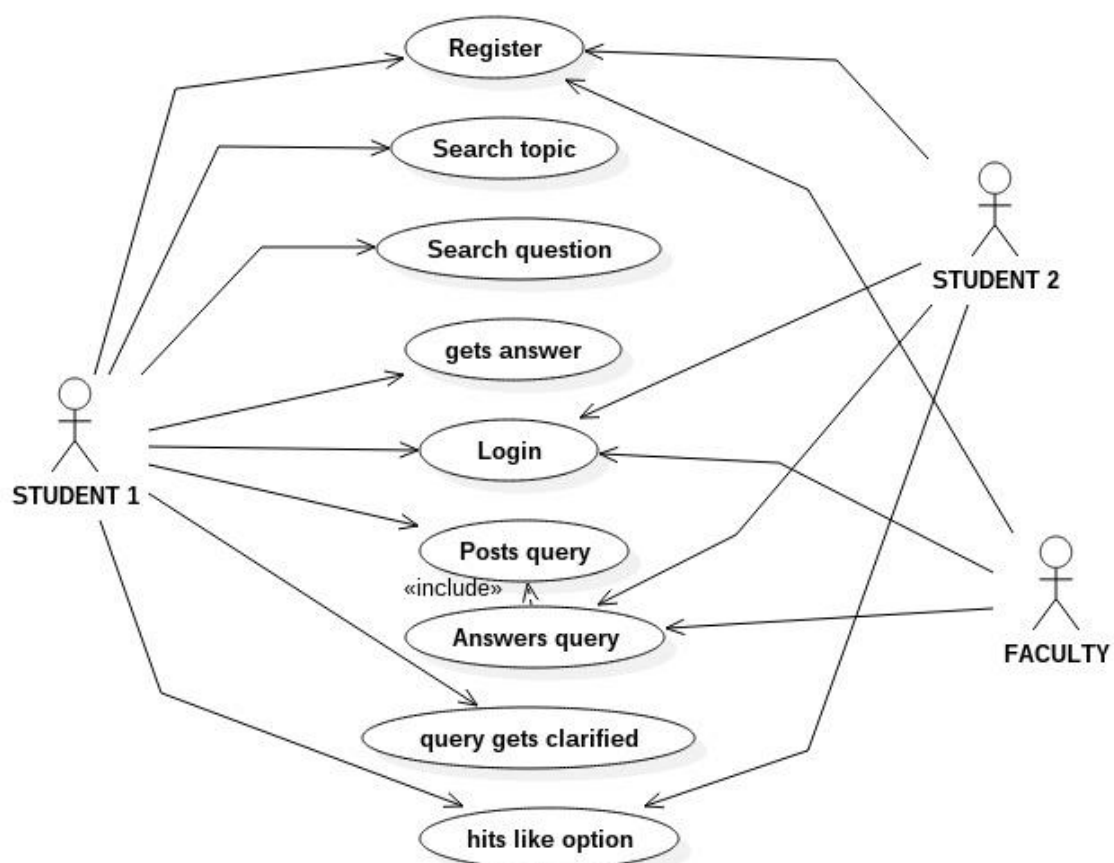


Fig: 1 – Use Case Diagram

CLASS DIAGRAM:

A class diagram in 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 objects.

CLASSES: User, Database, Post, Student, Faculty, Query, Answer.

The attributes of the user are Id, name, mail Id, phno, address, password. The Student class and Faculty class inherit the attributes of User class so they are connected using generalization. Methods are search Topic (), post Query (), search Query(), postAnswer(), like().

The attributes of the database are user Details, query Posts, answer Posts, likes. Methods are show Queries (), show Answers (), show Likes ().

The attributes of the post are date, time, no of Likes. The Query class and the Answer class inherit some attributes from Post class so they are connected using generalization. Methods are postedBy ().

This Student and Faculty class have an extra attribute called department which may or may not be the same for every user.

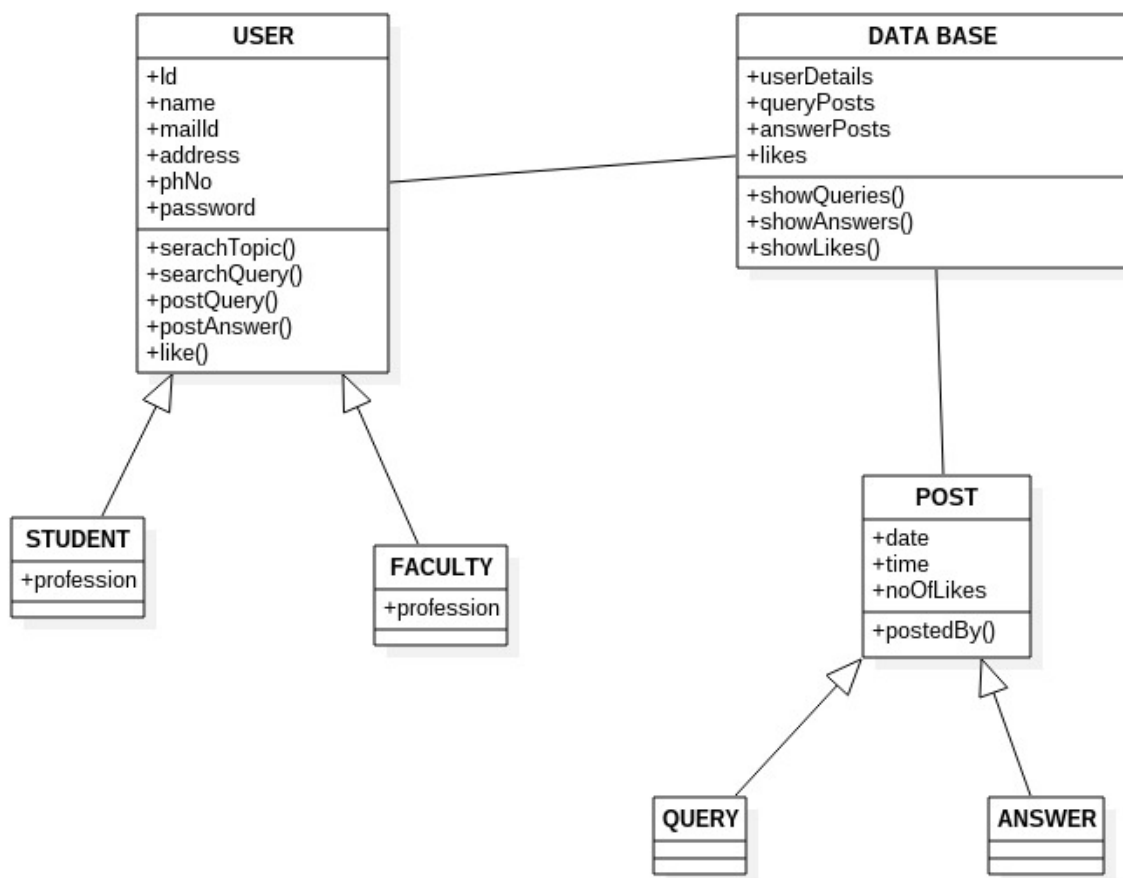


Fig: 2 – Class Diagram

SEQUENCE DIAGRAM:

A Sequence diagram is an interaction diagram that emphasizes the time ordering of messages. It consists of a set of objects and their Relationships, including the messages that may be dispatched among them. Sequence diagrams address the dynamic view of the system. Sequence diagrams are two dimensional in nature.

OBJECTS: Student1, Database, Student2, Faculty.

All the registered information is stored in the database. While login this database gets retrieved and provides access. And also all the questions posted and their answers are stored in the database.

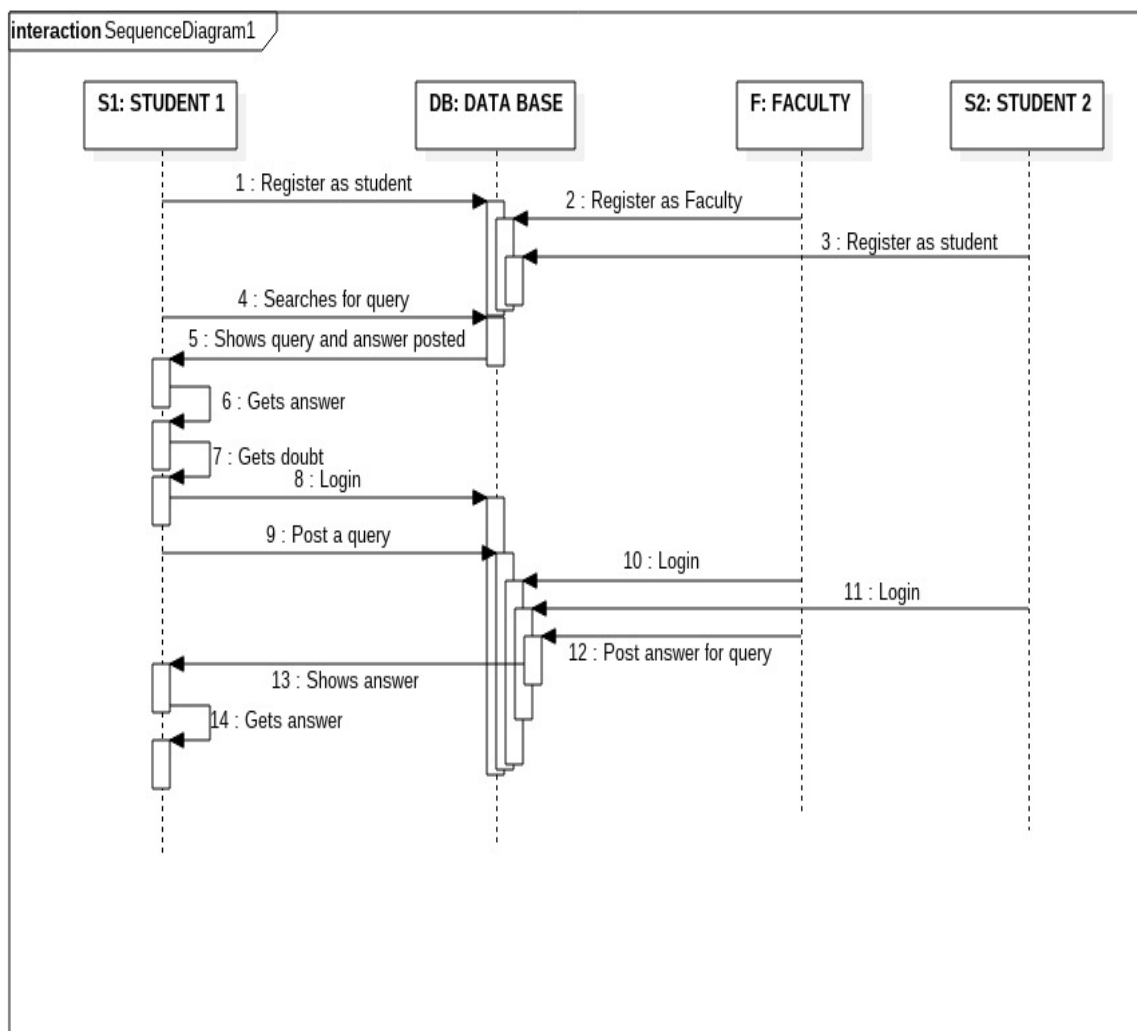


Fig: 3 – Sequence Diagram

ACTIVITY DIAGRAM:

An activity diagram is a special kind of state chart diagram that shows the flow from activity to activity within a system. Activity Diagrams address the dynamic view of a system. They are especially important in modelling the function of a System and emphasize the flow of control among objects

- It describes the flow of activity in the system.
- Before drawing an activity diagram, you should list activity of user and connection between both activities.

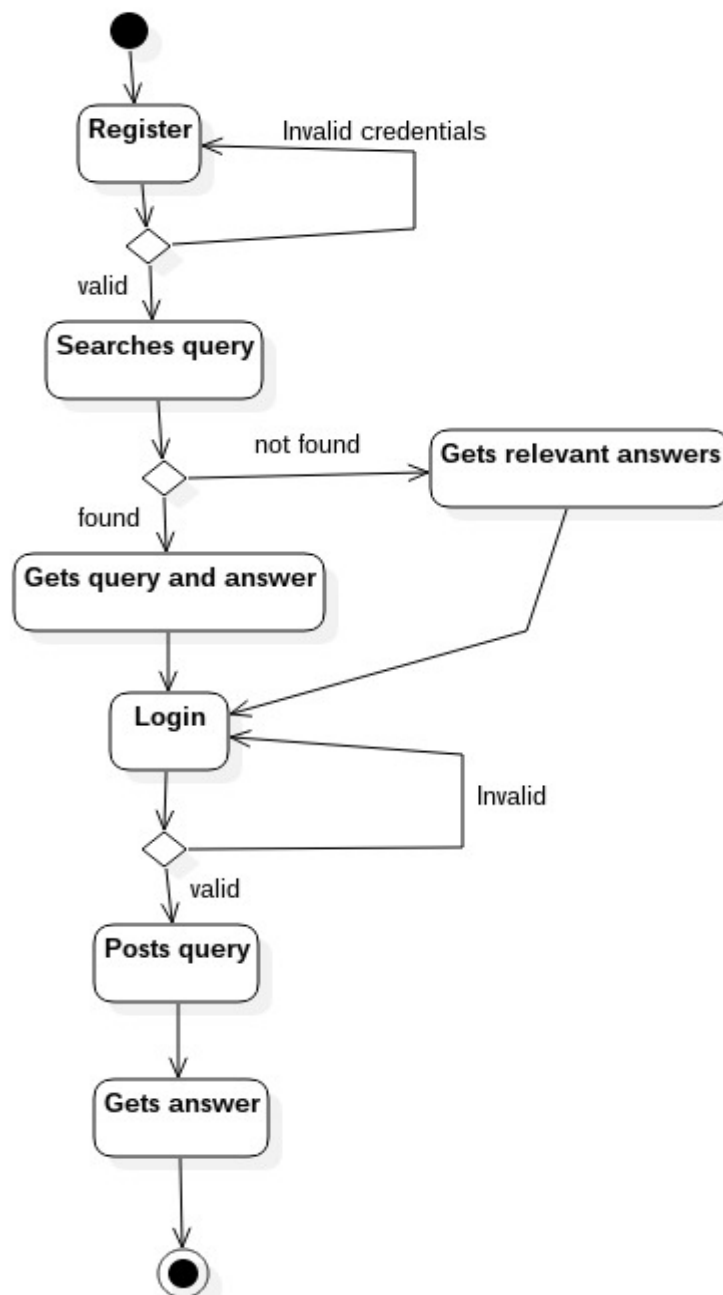


Fig: 4 – Activity Diagram

COLLABORATION DIAGRAM:

It is the organization of the objects that sends messages. A collaboration diagram is very similar to a sequence diagram. Collaboration diagram shows the objects and their association with other objects.

OBJECTS: Student1, Student2, Faculty, Database.

All the registered information is stored in the database. While login this database gets retrieved and provides access. And also all the questions posted and their answers are stored in the database.

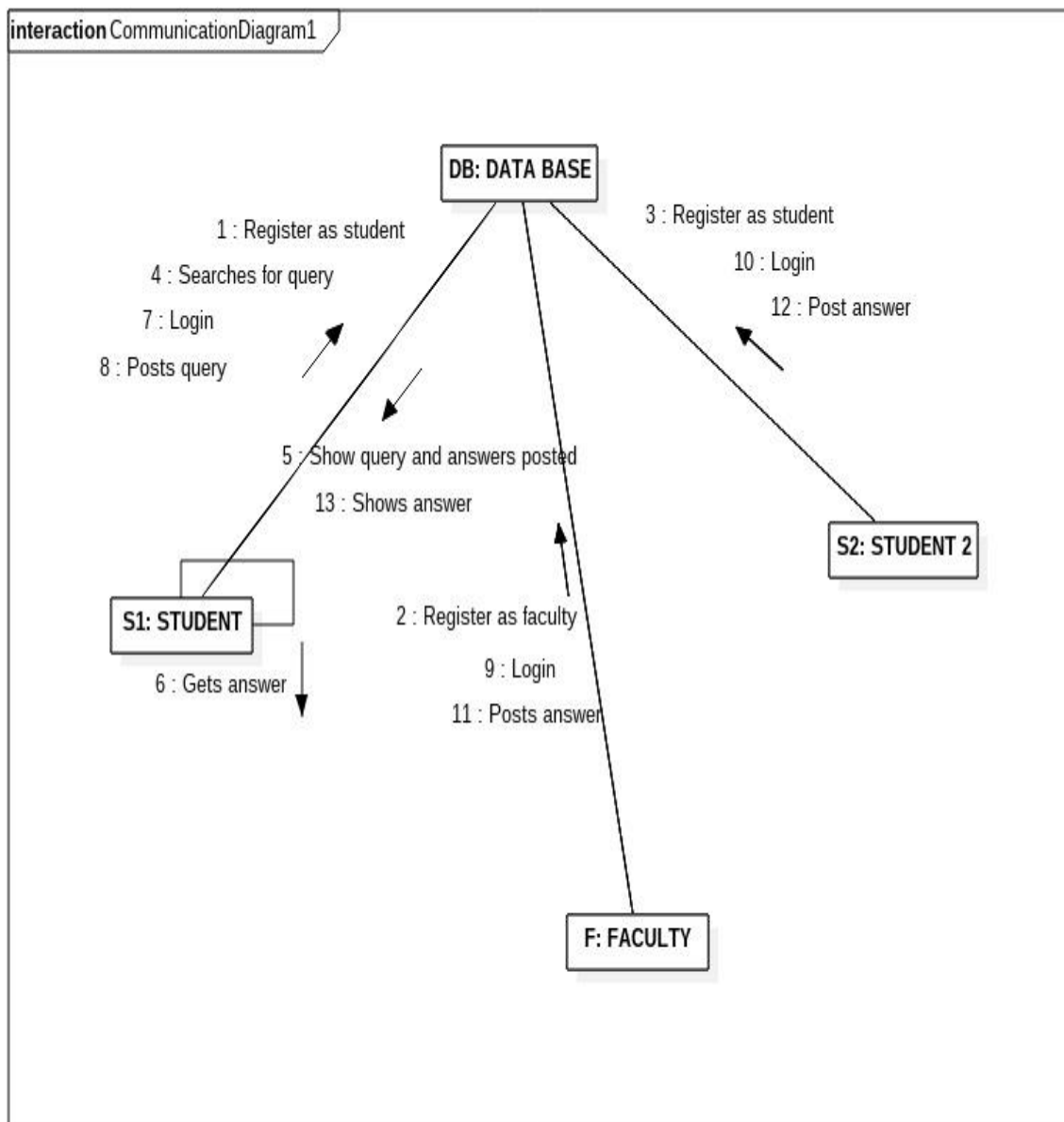


Fig: 5 – Collaboration Diagram

4.3 Database Designs

4.3.1 ER Diagrams:

An **Entity–relationship model (ER model)** describes the structure of a database with the help of a diagram, which is known as **Entity Relationship Diagram (ER Diagram)**. An ER model is a design or blueprint of a database that can later be implemented as a database.

ENTITIES: Student1, Student2, Faculty, Query.

ATTRIBUTES: FirstName, LastName, UserName, EmailId, Password (for Student1, Student2, Faculty), category.

RELATIONSHIPS: Post, Answers.

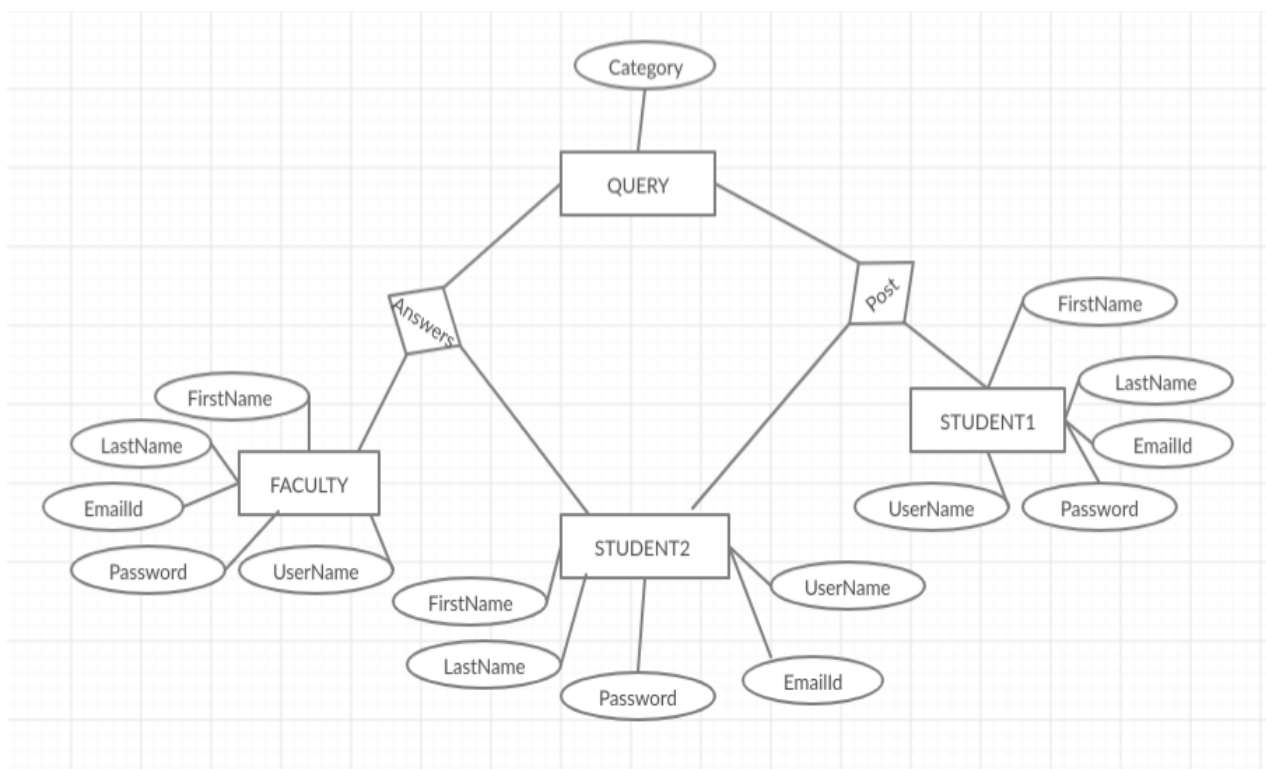


Fig: 6 – ER Diagram

4.3.2 Table Structures:

The tables in our project are user, questions, answers.
The table structures of these tables are:

Structure of "user":

Field	Type	Null	Key	Default	Extra
firstName	varchar(20)	YES		NULL	
lastName	varchar(20)	YES		NULL	
userName	varchar(20)	NO	PRI	NULL	
mailId	varchar(20)	YES		NULL	
Password	varchar(20)	YES		NULL	

Structure of "questions":

Field	Type	Null	Key	Default	Extra
username	varchar(20)	YES		NULL	
query	varchar(100)	YES		NULL	
category	varchar(20)	YES		NULL	

Structure of "answers":

Field	Type	Null	Key	Default	Extra
userName	Varchar(20)	YES		NULL	
category	varchar(20)	YES		NULL	
query	varchar(100)	YES		NULL	
answer	varchar(500)	YES		NULL	

5.SYSTEM IMPLEMENTATION:

5.1 Introduction:

The main aim of our project is to let the students get their prerequisites of who is unable to interact with the faculty members and also regarding any career guidance aspects like Recruitments, Workshops, Jobs etc. It is a "STUDENT FORUM" where faculty, other senior students and peers get registered on the website to clarify the prerequisites of the user.

In our project only the registered candidates can access the website by verifying the queries posted by others and can also post their queries. If the user is not registered, then the user must register accordingly.

The main functionality of our project is to clarify the prerequisites of the user. In our forum navigation bar consists of a Menu, Home, Ask, User info. Menu consists of

different programs such as Recruitments, Training programs, Workshops, Subjects. In home the user can refer to the previous queries posted by others so that the user finds his/her query if it is posted before. If the user couldn't find the appropriate solution for his/her query, then the user can visit, ask and post the query. In home, the user can view the solutions of the others queries by show answer option, if the user knows any answer for the posted queries then the user can also post answer by post answer option. User info consists of personal data of users like First Name, Last Name, User Name, Mail Id, password. If the user wants to make any changes in his/her info users can edit and click on Save Changes.

5.2 Project Modules:

There are four main options in the navigation bar of our project. They are MENU, HOME, ASK, userProfile (with name).

MENU: This option lets user to select four different categories (WORKSHOPS, RECRUITMENT, TRAINING PROGRAMS, SUBJECTS). Each category consists of its related questions and answers posted. It lets the user search for their query in simple and efficient way.

HOME: This option redirects the user to homepage whenever he/she is in another page.

ASK: This option lets user to post his query in the website so that his/her doubt gets clarified through others. This posted question is displayed to all users in their homepage. After typing the question one need to click "Post" option below. Then the question is posted to everyone displaying a message to the user.

User Profile (*with name*): This option on clicking displays the profile of the user. One can make any changes if needed and click on "Save Changes" option to get details updated.

For every question there are two option below it. They are "Show Answers" and "Post Answer".

Show Answer: This option shows all the answers posted by other users to that particular question.

Post Answer: This option lets user to post answer for that question in his/her view. The answer gets posted tagging that specific question.

5.4 Screens:

Registration Page

ACADEMIC GURU REGISTRATION FORM

Enter First Name

Enter Last Name

Enter Username

Enter Email Id

Enter Password

[Already a member](#)



Login Page

ACADEMIC GURU LOGIN FORM

Enter Username

Enter Password



First Page

ACADEMIC GURU

[MENU](#)

[HOME](#)

[ASK](#)

[TEAM](#)

Welcome TEAM.

Let's check out the queries waiting for your answers. Go to HOME to post answers

Have a doubt? Come and post it in the ASK to clarify.

Home Page

ACADEMIC GURU

[MENU](#)

[HOME](#)

[ASK](#)

[TEAM](#)

ALL CATEGORIES

USER	CATEGORY	QUERY	SHOW	POST
RAMU	WORKSHOPS	What are the workshops going on in the campus?	Show Answers	Post Answer
uma	RECRUITMENT	How many placements are completed till date?	Show Answers	Post Answer
ram	SUBJECTS	Best subject to learn in II B.Tech. II Semester?	Show Answers	Post Answer
gayatri	RECRUITMENT	What is pattern of Adobe Internship online test?	Show Answers	Post Answer
lakshmi	SUBJECTS	What is meant by relational model in DataBase?	Show Answers	Post Answer
Veekshita	WORKSHOPS	When is Machine Learning Workshop?	Show Answers	Post Answer
user	TRAININGPROGRAMS	What is the fee structure for Wise?	Show Answers	Post Answer

Ask Page

ACADEMIC GURU

MENU

HOME

ASK

TEAM

POST YOUR DOUBT HERE.

SELECT CATEGORY

Enter query here...

Post

NOTE: Answer for your question is posted by other user. So please wait...

User Profile Page

ACADEMIC GURU

MENU

HOME

ASK

TEAM

TEAM's Profile

FIRSTNAME:

LASTNAME:

USERNAME:

MAILID:

PASSWORD:

Save changes

Post Answer

ACADEMIC GURU

Please Post your Answer here for the question

Enter Answer here...

Post

Menu bar

ACADEMIC GURU

MENU

HOME

ASK

TEAM

WORKSHOPS

RECRUITMENT

TRAINING PROGRAMS

SUBJECTS

ALL CATEGORIES

USER	CATEGORY	QUERY	SHOW	POST
RAM	SUBJECTS	What are the workshops going on in the campus?	Show Answers	Post Answer
uma	RECRUITMENT	How many placements are completed till date?	Show Answers	Post Answer
ram	SUBJECTS	Best subject to learn in II B.Tech. II Semester?	Show Answers	Post Answer
gayatri	RECRUITMENT	What is pattern of Adobe Internship online test?	Show Answers	Post Answer
lakshmi	SUBJECTS	What is meant by relational model in DataBase?	Show Answers	Post Answer
Veekshita	WORKSHOPS	When is Machine Learning Workshop?	Show Answers	Post Answer
user	TRAININGPROGRAMS	What is the fee structure for Wise?	Show Answers	Post Answer

6. SYSTEM TESTING

6.1. INTRODUCTION:

Software Testing is an important element of the software quality assurance and represents the ultimate review of specification, design and coding. The increasing feasibility of software as a system and the cost associated with the software failures are motivated forces for III planned through testing.

TESTING OBJECTIVES

These are several rules that can save as testing objectives:

- Testing is a process of executing a program with the intent of finding an error.
- A good test case is one that has a high probability of finding an undiscovered error.

Test Levels

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

6.2. TESTING METHODS

6.2.1 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.

6.2.2 Integration Testing

Integration tests are designed to test integrated software components to determine if they run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields.

6.2.3 White Box Test

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 purposeful. It is used to test areas that cannot be reached from a black box level.

6.2.4 Black Box Test

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.

6.2.5 Acceptance Testing

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user.

7. Conclusion:

The user gets registered into the website where in the background all details of the user get stored in the database and the queries posted by the user are also stored.

At last the user can get appropriate solutions for his/her query from the guidance of other peers, faculty and seniors.

Our Project's main motto is to clarify the prerequisites of the user who are finding difficulty in clarifying her queries and also to have a STUDENT FORUM for our college. And the user is able to know the various pre-requisites/queries posted by others. Users can ask her query in any aspect regarding academics and get clarified.

8. BIBLIOGRAPHY

WEBSITES:

1. W3Schools:
2. Stack overflow:
3. Geeks for geeks:
4. TutorialsPoint:
5. JavatPoint:

9. APPENDIX

9.1 Introduction to Java and JDBC

JAVA:

Java is a write-once, run-anywhere programming language developed by Sun Microsystems. It is similar to C and C++ but a lot easier. You can combine Java with a lot of technologies like Spring, node JS, Android, Hadoop, J2EE, etc... to build robust, scalable, portable and distributed full-fledged applications. Java also promotes continuous integration and testing using tools like Selenium.

Features of java:

Java offers plenty of attractive features -

- Platform independent language
- Rich standard library making it easy to code. You can create a whole stand-alone application using Java.
- Java supports automatic memory allocation and deallocation (called garbage collection).
- It offers great performance as Java supports multithreading and concurrency, thus making it a highly interactive and responsive language.
- Secure and simple

What is the Java platform?

You must have heard a lot about Java as a programming language. But, do you know it is also a 'platform'? Java platform is a software-only platform quite different from traditional platforms like Windows, Mac, Linux or Solaris. The former runs on top of the hardware of the latter platforms. Java programs go through Java Virtual Machine, that converts the byte code into native code, thus making the program run just on any device! This means you don't need individual machine-specific compilers for the Java code to run. This is why Java is called a *platform* too. The Java programming language is *different* from the Java platform. Java programming language helps you build applications. What you write in the Java programming language is developed and run with the help of an existing collection of programs and tools collectively called a Java platform. Java platform consists of the JDK, JVM, and JRE.

There are four Java platforms of the Java programming language –

- Java SE (Java Platform, Standard Edition)
- Java EE (Java Platform, Enterprise Edition)
- Java FX
- Java ME (Java Platform, Micro Edition)

While stand-alone applications can be built on the Java SE platform, most of the world wide web (internet) depends on Java EE. Java ME is for applications on small devices (like mobile phones).

Components of Java

There are three main components of Java - JVM, JDK, and JRE.

JDK or Java Development Kit is where the developers write their code and run it through the JRE or Java Runtime Environment.

How is the code translated? That's through the Java Virtual Machine (JVM). With JVM, any code is written in Java (or any other language) can be translated to Java bytecode. Any machine can then implement this code based on the Operating System. JVM resides inside the JRE along with the java packages (libraries)

Java Database Connectivity (JDBC)

Java Database Connectivity (JDBC) is an application program interface (API) packaged with the Java SE edition that makes it possible to standardize and simplify the process of connecting Java applications to external, relational database management systems (RDBMS).

Fundamentally, applications written in Java perform logic. The Java language provides facilities for performing iterative logic with loops, conditional logic with *if* statements and object-oriented analysis through the use of classes and interfaces. But Java applications do not store data persistently. Data persistence is typically delegated to NoSQL databases such as MongoDB and Cassandra, or to relational databases such as IBM's DB2 or Microsoft's SQL Server or the popular open source database MYSQL

JDBC interfaces, classes and components

The JDBC API is composed of a number of interfaces and classes that represent a connection to the database, provide facilities for sending SQL queries to a database and help Java developers process the results of relational database interactions.

Common JDBC API classes and interfaces	
java.sql.Connection	Represents a connection from the Java program to the external database system
java.sql.Statement	Used to issue raw SQL statements to a relational database
java.sql.PreparedStatement	Used to issue precompiled SQL statements to a relational database
java.sql.ResultSet	Represents the results returned from a relational database after an SQL statement has been processed
java.sql.Blob	The blob represents a database field containing a large binary object such as an image or a video.

JDBC and SQL compared

Structured Query Language (SQL) is an ISO specification that defines how applications can query, update and just generally interact with a relational database. The JDBC API does not perform any functions that could otherwise be performed through a SQL query. The goal of the JDBC API is to provide a connection to a relational database through which SQL queries can be performed, and the results from those queries can be processed within a Java program. JDBC is a connectivity API. SQL remains the language used to actually talk to the database.

JDBC architecture

JDBC is designed to make Java applications database agnostic. That is, a program written using JDBC will work with any JDBC compliant database. That was a Java application that is tested with Apache Derby can confidently be deployed against an IBM DB2 database in production. However, there are differences between database vendors, and these differences must be abstracted away. The tool for abstracting away these differences is known as a JDBC driver..

How to connect to a database with JDBC

The basic steps to connect to a JDBC database are:

1. Load the right JDBC driver
2. Obtain the database URL
3. Use the JDBC DriverManager to connect to the database
4. Create a SQL based Statement or PreparedStatement object
5. Execute the statement against the database
6. Process the results and handle any SQL exceptions
7. Close any database connections or resources no longer in use.

Types of JDBC drivers

The JDBC-ODBC bridge is referred to as the Type 1 JDBC driver. There are four types, with the distinctions being:

1. The Type 4 JDBC driver is written purely in Java and works over a network connection. This is often referred to as the JDBC thin driver.
2. The Type 3 JDBC driver which first interacts with a middleware server such as IBM WebSphere, which then in turn communicates with the relational database. This is sometimes referred to as the JDBC proxy driver.
3. The Type 2 JDBC driver which may or may not be written in Java. These drivers typically include proprietary code written specifically for a given database to optimize performance and throughput. This driver is often referred to as the thick JDBC driver.
4. The Type 1 JDBC driver is the aforementioned JDBC-ODBC bridge.

9.2 Introduction to CSS, HTML, JSP

CSS:

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 colours are used, layout designs, 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 markup languages HTML or XHTML.

Advantages of CSS:

- **CSS saves time** – You can write CSS once and then reuse the 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.

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.

Why Use CSS?

CSS is used to define styles for your web pages, including the design, layout and variations in display for different devices and screen sizes.

What is HTML?

HTML is the standard mark-up language for creating Web pages.

- HTML stands for Hyper Text Mark-up Language
- HTML describes the structure of a Web page
- HTML consists of a series of elements
- HTML elements tell the browser how to display the content
- HTML elements are represented by tags
- HTML tags label pieces of content such as "heading", "paragraph", "table", and so on
- Browsers do not display the HTML tags, but use them to render the content of the page

Example Explained

- The `<!DOCTYPE html>` declaration defines this document to be HTML5
- The `<html>` element is the root element of an HTML page
- The `<head>` element contains meta information about the document
- The `<title>` element specifies a title for the document
- The `<body>` element contains the visible page content
- The `<h1>` element defines a large heading
- The `<p>` element defines a paragraph

Introduction to JSP

- It stands for **Java Server Pages**.
- It is a server side technology.
- It is used for creating web applications.
- It is used to create dynamic web content.
- In this JSP tags are used to insert JAVA code into HTML pages.
- It is an advanced version of Servlet Technology.

- It is a Web based technology that helps us to create dynamic and platform independent web pages.
- In this, Java code can be inserted in HTML/ XML pages or both.
- JSP is first converted into servlet by JSP container before processing the client's request.

JSP pages are more advantageous than Servlet:

- They are easy to maintain.
- No recompilation or redeployment is required.
- JSP has access to the entire API of JAVA .
- JSP are extended versions of Servlet.

Features of JSP

- **Coding in JSP is easy:** As it is just adding JAVA code to HTML/XML.
- **Reduction in the length of Code:** In JSP we use action tags, custom tags etc.
- **Connection to Database is easier:** It is easier to connect a website to the database and allows to read or write data easily to the database.
- **Make Interactive websites:** In this we can create dynamic web pages which help users to interact in a real time environment.
- **Portable, Powerful, flexible and easy to maintain:** As these are browser and server independent.
- **No Redeployment and No Re-Compilation:** It is dynamic, secure and platform independent so no need to re-compilation.
- **Extension to Servlet:** As it has all features of servlets, implicit objects and custom tags.

9.3 Introduction to MySQL

MySQL:

MySQL is the most popular Open Source Relational SQL Database Management System. MySQL is one of the best RDBMS being used for developing various web-based software applications. MySQL is developed, marketed and supported by MySQL AB, which is a Swedish company.

WHAT IS A DATABASE?

A database is a separate application that stores a collection of data. Each database has one or more distinct APIs for creating, accessing, managing, searching and replicating the data, it holds.

Other kinds of data stores can also be used, such as files on the file system or large hash tables in memory but data fetching and writing would not be so fast and easy with those types of systems.

Nowadays, we use relational database management systems (RDBMS) to store and manage huge volumes of data. This is called a relational database because all the data is stored into different tables and relations are established using primary keys or other keys known as Foreign Keys.

A Relational Database Management System (RDBMS) is a software that:

- Enables you to implement a database with tables, columns and indexes.
- Guarantees the Referential Integrity between rows of various tables.
- Updates the indexes automatically.
- Interprets an SQL query and combines information from various tables.

MySQL Database:

MySQL is a fast, easy-to-use RDBMS being used for many small and big businesses. MySQL is becoming so popular because of many good reasons –

- MySQL is released under an open-source license. So, you have nothing to pay to use it.
- MySQL is a very powerful program in its own right. It handles a large subset of the functionality of the most expensive and powerful database packages.
- MySQL uses a standard form of the well-known SQL data language.