Object Oriented Analysis And Design With Java – UE20CS352

Mini Project On Quiz Application

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SOFTWARE REQUIREMENTS SPECIFICATION

1. Introduction

1.1. Purpose

The purpose of System Requirements Specification (SRS) document is to describe the external behavior of the Quiz Application. Requirements Specification defines and describes the operations, interfaces, performance, and quality assurance requirements of the Quiz Application. The document also describes the nonfunctional requirements such as the member interfaces. It also describes the design constraints that are to be considered when the system is to be designed, and other factors necessary to provide a complete and comprehensive description of the requirements for the software. The SRS captures the complete software requirements for the system.

1.2. Intended Audience and Reading Suggestions

The application focuses on students, professors, trainees, club enthusiasts and quiz conductors to take up quiz based tests with ease and convenience.
The rest of the SRS contains details about objectives, scope, limitations, primary requirements and other relevant material.

1.3. Project Scope

The application's purpose is to make conducting & taking quizzes seamless and efficient, over the internet. It provides a simple environment that enables quiz conductors and quiz takers to host/take up their respective quizzes with ease and convenience. The Quiz Application is supposed to have the following features.

- The application provides members with the ability to take up and host their own quizzes.
- The system provides facility for each member to login to their own accounts.
- The system provides the members with the option to change their profile details and/or change their password whenever needed.
- The system allows each member to create their own quiz, along with time constraints and deadlines and share it to it's intended quiz takers by means of a unique code/URL.
- The system allows members to take up quizzes for which they have been given permission to take up (by the quiz conductor)
- The system provides an interface for the quiz takers to take up their quiz, with options for navigation, alerts for the remaining time, along with the current question and it's options as posted by the quiz conductor.

- The system intimates the score obtained by the quiz taker at the end of the quiz.
- The scoring system is handled as desired by the quiz conductor.
- The application allows the quiz conductor to view details related to the status of the quiz.

1.4. Overview

The SRS will provide a detailed description of the Quiz Application. This document will provide the outline of the requirements, overview of the characteristics and constraints of the system.

1.4.1. Chapter 2 - Overall Description

This section of the SRS will provide the general factors that affect the product and its requirements. It provides the background for those requirements. The items such as product perspective, product function, user characteristics, constraints, assumptions and dependencies and requirements subsets are described in this section.

1.4.2. Chapter 3 - External Interface Requirements

This section of the SRS describes the interface requirements, namely UI requirements, Hardware and Software Interface requirements and Communication interface requirements.

1.4.3. Chapter 4 - System Features

This section of SRS captures most of the feature structure provided by Quiz Application. This section briefly explains each feature, its priority and stimulus and response sequence of the same.

1.4.4. Chapter 5 - Other Non-Functional Requirements

This section of SRS captures all the non-functional requirements of the Quiz Application. This section explores safety & security requirements, and other quality attributes: Reliability, Maintainability and Availability.

2. Overall Description

2.1. Product Perspective

The Quiz Application is a system developed keeping in mind the perspective of primary test takers and test conductors, like students & professors; although any other actors like competition conductors, quiz clubs and such enthusiasts can make use of the application.

It greatly benefits colleges and schools because they can seamlessly conduct their tests through this popular format for assessment. Any member can be a quiz conductor and a quiz taker.

The quiz created by a member quiz conductor is stored over the cloud. Quiz takers are given access to take up the quiz within a specified deadline. The results of each quiz taker is stored along with their details separately for the quiz conductor's future reference.

It aims to simplify the process of conducting quizzes online, with minimal effort required to conduct or take a quiz. The product is required to interact with other systems like the Internet, the cloud database, the member and the administrators.

Overview:

- Admin Manages Teachers, Students, Quizes
- Teacher can only View Student Performance, Create Quiz
- Student can attend quiz, View Result2.2. Product Functions

The Quiz Application the basic functions as described in project perspective section. The functions of the system include the system providing different type of services based on the type of members [Member/Admin].

- The member should be able host a quiz, or can even take up a quiz from a unique code.
- The quiz conductor should be able to set the timings of the quiz.
- The quiz conductor should be able to pool the questions into the database and can set number of questions and number of options for each question.
- The quiz conductor should be able to view the score and certain details of the quiz takers.
- The quiz taker should be able to access the quiz with the help of the unique code.
- The quiz taker should be able to view his/her score as soon as he/she submits the quiz.
- The quiz taker should be able to view the scores of previous quizzes.
- The admin should be able to add/edit/remove quizzes/members from the database.

2.3. User Classes and Characteristics

The users of the system are the members and the administrators who maintain the system.

2.3.1. Teacher

The teacher are assumed to have basic working knowledge of computers and internet browsing.

2.3.2. Admin

The administrators handle the internals of the system. They will be able to rectify the errors/crashes in case of power failure/system overload. Admins have superuser permissions, and can modify the database and add/remove/edit features at their will.

2.3.2. Student

Student can take up quiz

2.4. Operating Environment

The application will include support for the , q operating system and major ± distributions. It is intended to independently work across these different platforms without any major dependencies.

2.5. Design and Implementation Constraints

- The information of all the members must be stored in a database that is accessible by the Quiz Application.
- The Quiz Application is connected to the local computer and is running all 24 hours a day.
- The users access the Quiz Application from any computer that has Internet browsing capabilities and an Internet connection.
- The scoring system is connected to the Quiz Application system and the database used by the scoring system must be compatible with the interface of the Quiz Application.
- The members must have their correct usernames and passwords to enter into the application.

2.6. Assumptions and Dependencies

- The quiz conductors will only set right questions.
- The users are quite familiar with computers and accessing application’s interface.

- The quiz takers have an uninterrupted Internet connection.
- The users are comfortable with the English language and can understand UI options provided.
- The quiz format will only consist of MCQ questions.
- Google Cloud Platform will provide uninterrupted service for accessing our data through their cloud interface.

3. External Interface Requirements

3.1. User Interfaces

- The user interface will be a standard application window with components like buttons, text fields, radio buttons etc.
- First time users will have to create an account through a registration form page.
- After login, the user will be redirected to his dashboard where he can either take up an existing quiz by entering the unique quiz code or create a new quiz.
- Users are given options to log out and change their personal preferences of the application.

3.2. Hardware Interfaces

- The application will collect data from the users and push it to our cloud for persistent storage and future processing.
- Any computer that can run on , q 7 or above, ± distributions like Ubuntu 16.04 and such similar ± distributions will be compatible to run the application without any major issues and bottlenecks.

3.3. Software Interfaces

Database	:	Firebase
Front-End Application	:	Written in a general purpose programming language.

3.4. Communications Interfaces

- The system will be connected to the Internet.

- Communication to the database will take place through existing secure APIs defined by Google Cloud Platform.
- Firewall and antivirus programs are recommended for security purposes.

4. System Features

4.1. User Authentication

4.1.1. Description and Priority

Each user will be allowed to access the features provided by the application only after they login to their respective account. Provision will be given for first-time users to create a new account for themselves.

4.1.2. Stimulus/Response Sequences

The user on opening the application sees a prompt in his/her user interface asking him/her to login to their account or create a new account. Existing users can login to their account by providing their login ID and password, whereas new users will have to fill out a form and register their account with the application. The credentials will be validated by the system and the user will be be proceeded to the application dashboard if the credentials are correct. Otherwise, he/she will receive an intimation claiming that the credentials are invalid.

4.2. Database and Storage

4.2.1. Description and Priority

The proposed database is intended to store, retrieve, update information related to the users, which includes:

- User details
- Questions and Responses List
- Test Results

4.2.2. Stimulus/Response Sequences

Responses for the Administrator

- The administrator can login and logout using his/her credentials.
- The system will check for the validity of the login.

- Upon successful login the administrator will be able to perform basic **CRUD** operations and other operations that can be performed on the database.

Responses for the quiz taker

- When the user creates a new account, the user record is added to the database.
- The quiz taker can update his/her details.
- The quiz taker's test results will get stored in the database after the completion of each quiz.

4.3. Creating A Quiz

4.3.1. Description and Priority

This is one of the primary features of the application, and it is a platform to generate new quizzes along with their constraints.

4.3.2. Stimulus/Response Sequences

Any member who's logged in to the application can create his own quiz. The member can type in his/her questions along with their choices, and indicate to the system the correct option. He/she can also set the preferences for time control, number of questions, shuffling, pooling of questions etc. He/She will be given an interface to set these parameters for the quiz once the questions are uploaded. Once this is done, the system will prompt the user with a confirmation and generate a unique code for the quiz that can be shared with the quiz takers.

4.4. Taking A Quiz

4.4.1. Description and Priority

This is one of the primary features of the application, and it is a platform to take up existing quizzes.

4.4.2. Stimulus/Response Sequences

Any member who's logged in to the application can take up a quiz that has already been published on the application by some other user, using the unique code of the quiz. The user has to take up the quiz within the deadline, if any. Otherwise, the system will intimate the user that the quiz has expired. On taking up a valid quiz, the user can select options for each question one by one, can revisit marked questions and can submit the quiz within the timer. On timer expiry, the latest marked answers are auto-submitted by the application. Once the quiz has ended, the user is intimated with his/her score. The user's score & few other details are also stored by the application for the quiz conductor's reference.

5. Other Nonfunctional Requirements

5.1. Safety Requirements

The application is meant to be used as-is. Interested users are informed to download the application files from our official repository . Users are also required to keep their account credentials private, for maintaining their own privacy.

5.2. Security Requirements

The system's database is highly secure, since it is hosted on Google Cloud Platform, which has its own security solutions. Google Cloud Platform is an industrially renowned expert in providing such solutions. The application's internal working is abstracted from the user, thus it is not vulnerable to manual changes.

5.3. Software Quality Attributes

5.3.1. Reliability

The system's database is completely maintained online as the system uses Google Firebase for data storage. Thus, the application will be reliable and robust, and will be free from data breaches and other such vulnerabilities. Each end-user is authorized by means of Login ID and Password, thus privacy is maintained.

5.3.2. Availability

The application will be available to all the members, provided they have a stable and persistent Internet connection. The application will not be down unless our cloud data is unreachable, and since Google Firebase is a reliable solution with very minimal and infrequent downtimes, the application is available 24/7.

5.3.3. Maintainability

The application is regularly monitored by the crash analytics feature of Firebase. The performance of the application remains unaltered for any number of members, provided the application's hosting resources are scaled suitably.

USE-CASE MODEL

6. Use-Case Scenarios

6.1. UC1 : Create A New Account

Scope

Quiz Application

Level

User Goal

Actor(s)

Member

Pre-Condition(s)

1. Actor must have a supported device with active Internet connection.
2. Actor must have the application installed in his/her device.

Post-Condition(s)

1. Actor's account will be created.
2. Database has a record of actor's account details.

Main Scenario

1. Actor enters a *Username*, a constraint-satisfying *Password* and repeats the same password for confirmation in another field.
2. Actor enters first name, last name, e-mail ID, nationality and profession.
   Actor repeats step 1-2 until a unique username is filled or until there is no password mismatch or until the e-mail ID is unique.
3. System validates the details given by the actor.
4. System adds actor's account details to the database.
5. System takes the actor to the login page.

Alternate Scenario 1

1. Actor experiences network connectivity issues/other system issues.
2. System attempts recovery procedures and does error logging.
3. System flushes the existing related content and reverts the process.
4. System takes actor back to the registration page.

Frequency of Occurrence Occasional, only one time per user.

6.2. UC2 : Login To An Existing Account

Scope

Quiz Application

Level

User Goal

Actor(s)

Quiz Taker, Quiz Conductor, Administrator

Pre-Condition(s)

1. The actor must have a supported device with an active Internet connection.
2. The actor must have a registered account to login.

Post-Condition(s)

1. Upon successful login, the actor is authorized into the system and shown his/her dashboard based on his/her granted permissions.

Main Scenario

1. Actor enters his/her credentials for authentication.
2. System verifies the credentials and lets the actor into the application, upon successful authentication.
3. System reverts back to home page.

Alternate Scenario 1

1. Actor enters incorrect credentials.
2. System intimates actor with relevant error message.
3. System reverts actor back to login page.

Alternate Scenario 2

1. Actor experiences network connectivity issues/encounters other problems.
2. System attempts recovery procedures and does error logging.
3. System intimates actor with relevant error message.
4. System reverts actor back to login page.

Frequency of Occurrence

Frequent, needed as and when the actor needs to use the application.

6.3. UC3: Create A New Quiz

Scope

Quiz Application

Level

User Goal

Actor(s)

Quiz Conductor

Pre-Condition(s)

1. Actor should be logged in.
2. Actor must be connected to the Internet.

Post-Condition(s)

1. Actor's quiz is uploaded to the database and saved along with the correct responses.
2. System generates a unique code for the quiz, and is intimated to the actor.
3. Actor is returned to the main menu.

Main Scenario

1. Actor chooses quiz preferences, including duration, deadline, number of questions, shuffle, question pooling etc.
2. System stores the preferences for the quiz and proceeds to show the quiz form for the actor to fill out.
3. Actor fills the form for one question and confirms the action.
4. System stores the question along with its options, and clears the form for the next question to be filled.
   Actor repeats steps 3-4 until all the questions are set and stored.
5. Actor confirms the publication of the quiz.
6. System uploads all the quiz related content to the online database.

Alternate Scenario 1

1. Actor cancels the creation of the quiz in between.

2. System flushes the existing content related to the quiz.
3. Actor is intimated that the action has been canceled.
4. System reverts actor to the main menu.

Alternate Scenario 2

1.
2.
3. System flushes the existing content related to the quiz.
4. System reverts actor to the main menu.

Frequency of Occurrence

Occasional, as domain understanding dictates that quizzes will not be created as frequently.

Actor experiences network connectivity issues/other system issues.
System attempts recovery procedures and does error logging.

6.4. UC4: Take Up A Quiz

Scope

Quiz Application

Level

User Goal

Actor(s)

Quiz Taker

Pre-Condition(s)

1. Actor should be logged in.
2. The quiz must be available.
3. Actor must have the quiz's unique code.
4. Actor must be connected to the Internet.

Post-Condition(s)

1. Actor is intimated with his score.
2. Actor's score and details are updated to the database.
3. Actor is returned to the main menu.

Main Scenario

1. Actor enters the quiz code and confirms the start of his/her attempt. The quiz timer starts on confirmation.
2. Actor is displayed a question with its choices. The actor picks his/her response.
3. Actor moves to the next/previous question.
   Actor repeats steps 2-3 until all questions are attempted, or until the timer expires and the attempt is auto-submitted.
4. Actor's latest answers are saved and considered for evaluation on submission.

Alternate Scenario 1

1. Actor enters an invalid/expired quiz code.
2. Actor is intimated with a relevant error message.
3. System reverts actor to the main menu.

Alternate Scenario 2

1.
2.
3. Actor's attempt is not considered.
4. System reverts actor to the main menu.

Frequency of Occurrence

Somewhat frequent, as an actor will probably take up multiple quizzes.

Actor experiences network connectivity issues/other system issues.
System attempts recovery procedures and does error logging.

6.5. UC5: View Quiz Status

Scope

Quiz Application

Level

User Goal

Actor(s)

Quiz Conductor

Pre-Condition(s)

1. Actor should be logged in.
2. The quiz must be available.
3. Actor should be the owner of the quiz. 4. Actor must have the unique quiz code.
5. Actor must be connected to the Internet.

Post-Condition(s)

1. Actor is shown a list of quiz taker's details along with their respective scores.
2. Actor is returned to the main menu.

Main Scenario

1. Actor enters the quiz code to view the scores of the quiz takers.
2. System returns the scores of the quiz takers.
3. Actor returns to the main menu.

Alternate Scenario 1

1. Actor enters an invalid/expired quiz code.
2. Actor is intimated with a relevant error message.
3. System reverts actor to the main menu.

Alternate Scenario 2

1. Actor enters a valid quiz ID.
2. System intimidates a warning message, if zero quiz takers attempted the quiz.

3. System reverts actor to the main menu.

Alternate Scenario 3

1.
2.
3. System reverts actor to the main menu.

Frequency of Occurrence

Very occasional, as the actor will view quiz status only after the deadline.

Actor experiences network connectivity issues/other system issues.
System attempts recovery procedures and does error logging.

6.6. UC6 : Perform Housekeeping

Scope

Quiz Application

Level

User Goal

Actor(s)

Administrator

Pre-Condition(s)

1. Actor should be logged into the system.
2. Actor must be connected to the Internet.

Post-Condition(s)

1. Actor is returned to the main-menu.

Main Scenario

1. Actor chooses quiz/member ID.
2. Actor enters the respective ID.
3. Actor chooses to delete/not delete that ID.
4. Actor confirms his/her decision.

Alternate Scenario 1

1. Actor enters an invalid ID.
2. Actor is intimidated with the error message.
3. System reverts actor to the main menu.

Alternate Scenario 2

1. Actor experiences network connectivity issues/other system issues.
2. System attempts recovery procedures and does error logging.
3. System reverts actor to the main menu.

Frequency of Occurrence

Rare, as administrative CRUD activities need to be done only when required.

7. Usecase Diagram

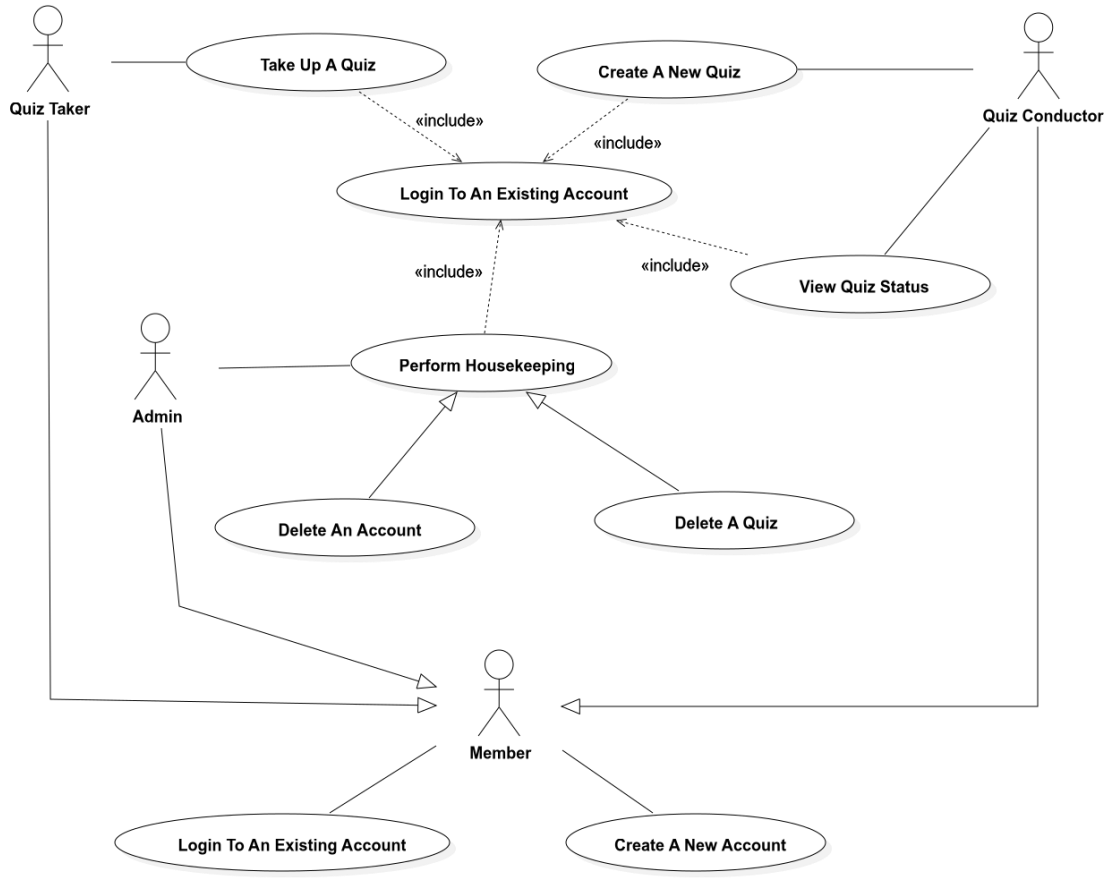


Figure 7.1.: *Usecase Diagram for the Quiz Application*

UML DIAGRAMS

DOMAIN MODEL

8. Class Diagram

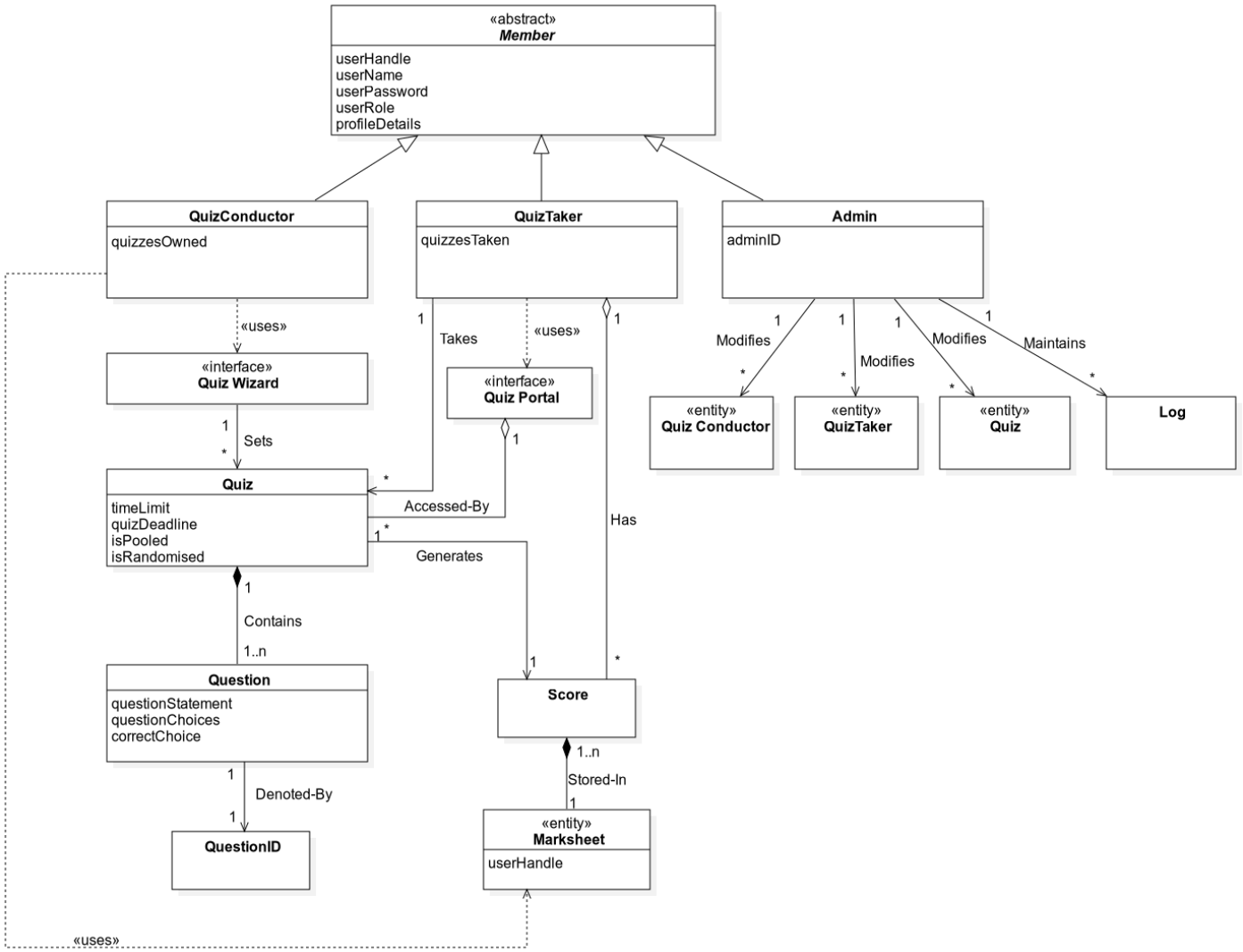


Figure 8.1.: *Domain model using class diagram*

STATE CHART DIAGRAM

10. State Chart

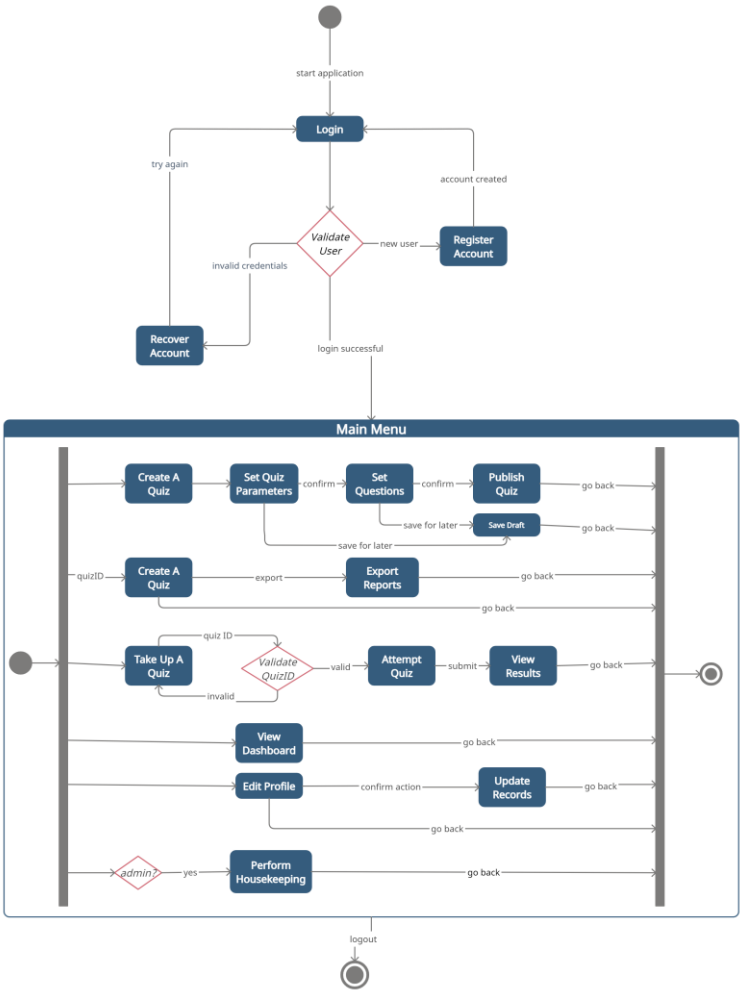
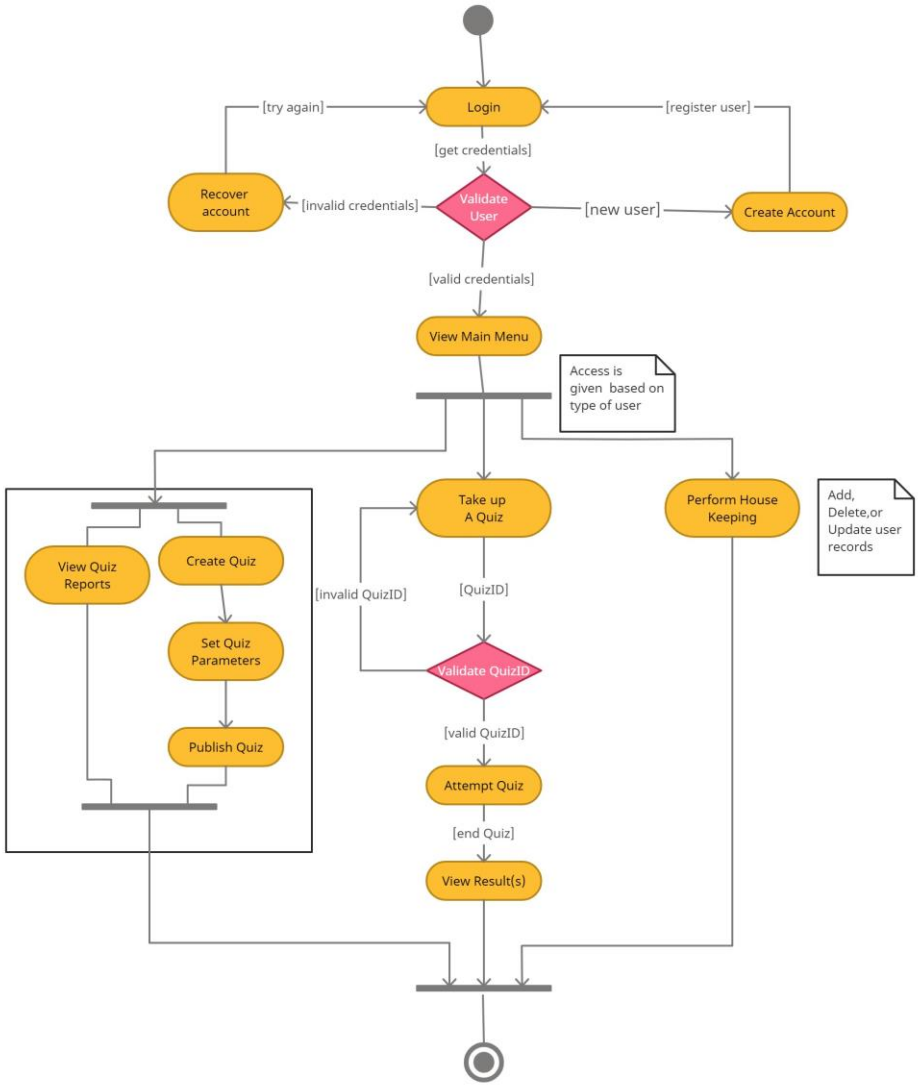


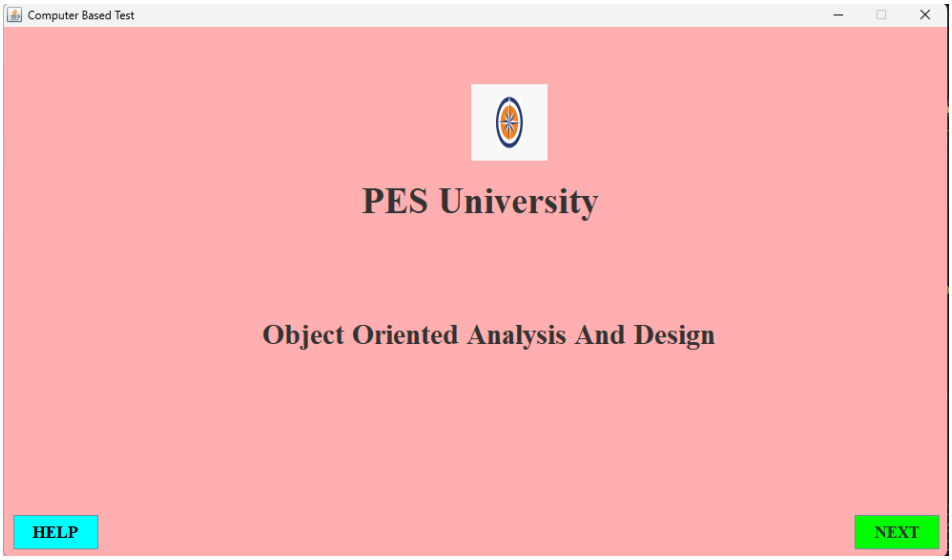
Figure 10.1.: *State Chart diagram*

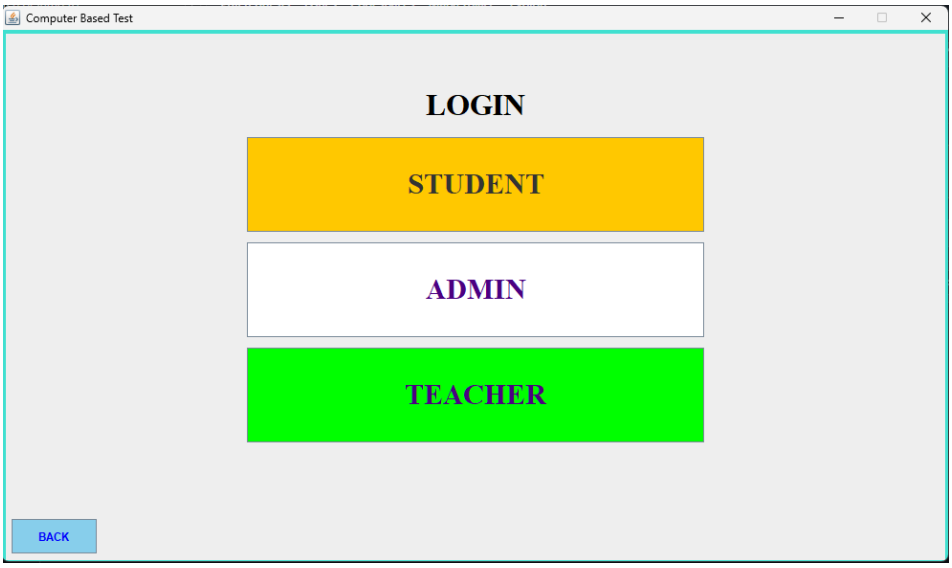
ACTIVITY DIAGRAM

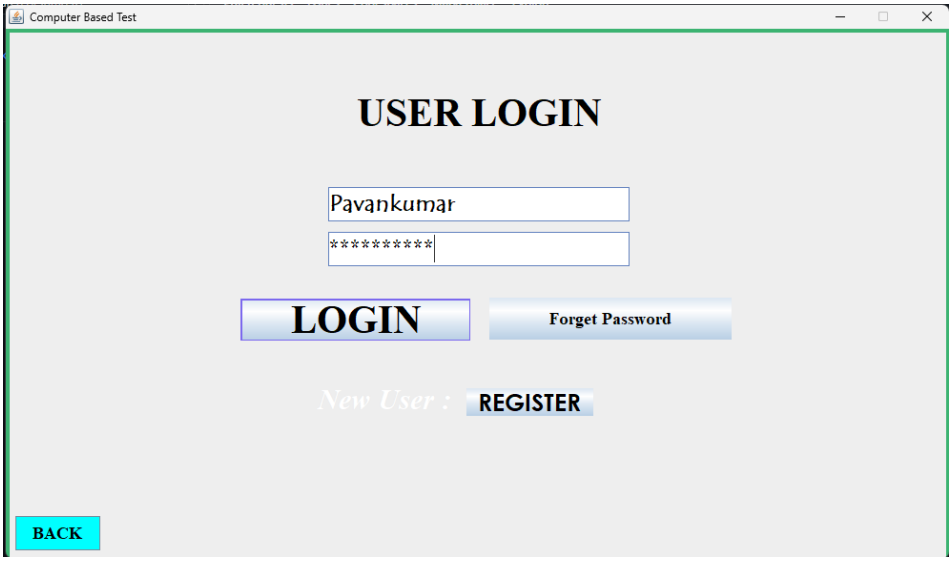
11. Activity Diagram

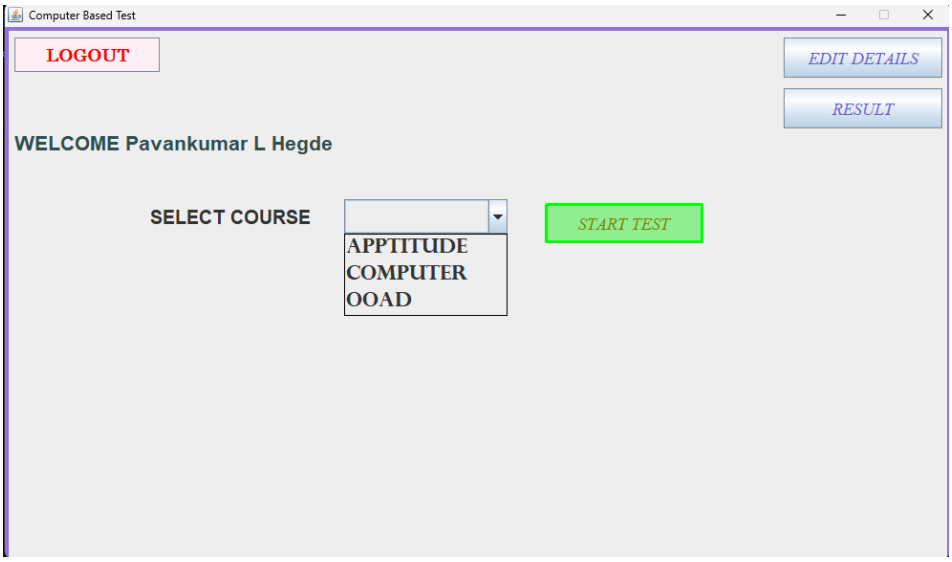


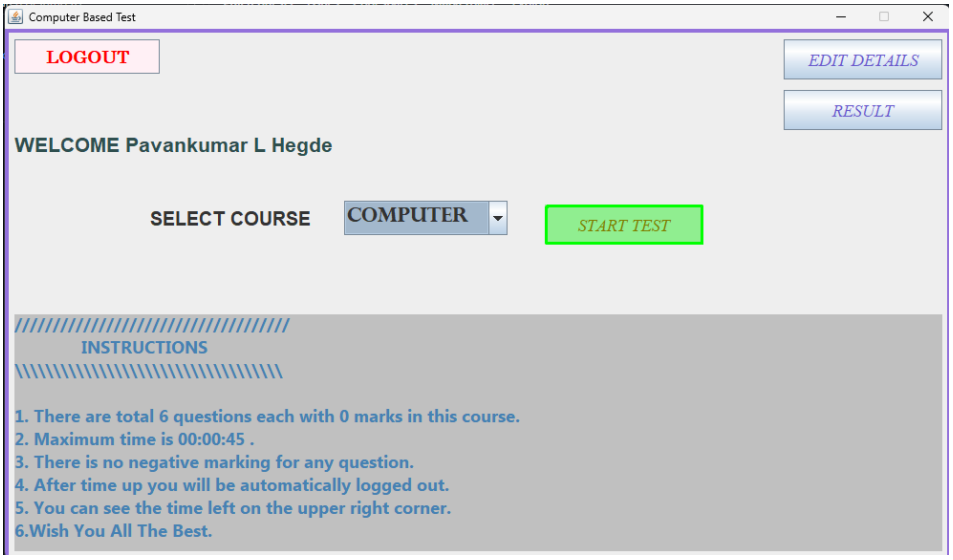
OUTPUT

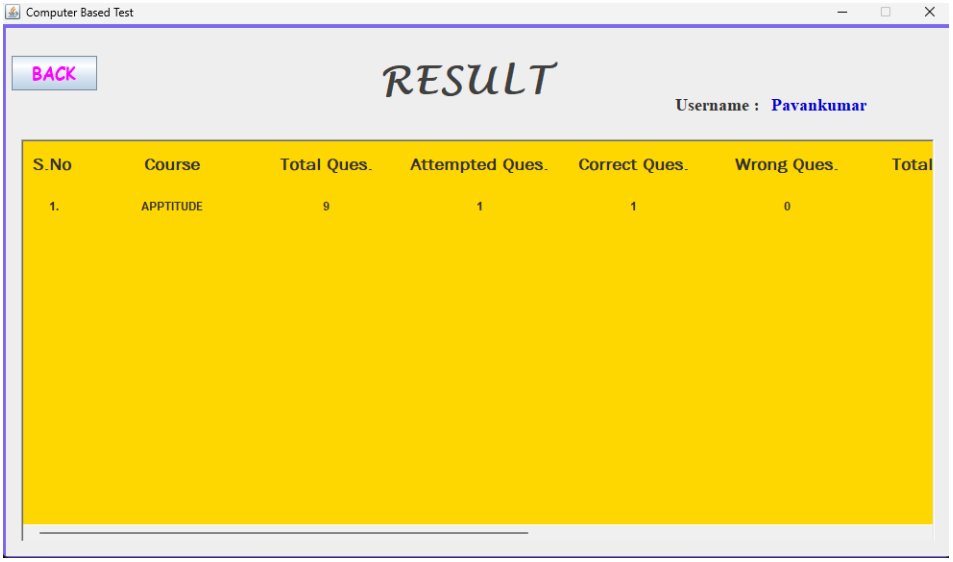

Computer Based Test
PES University
Object Oriented Analysis And Design
HELP
NEXT

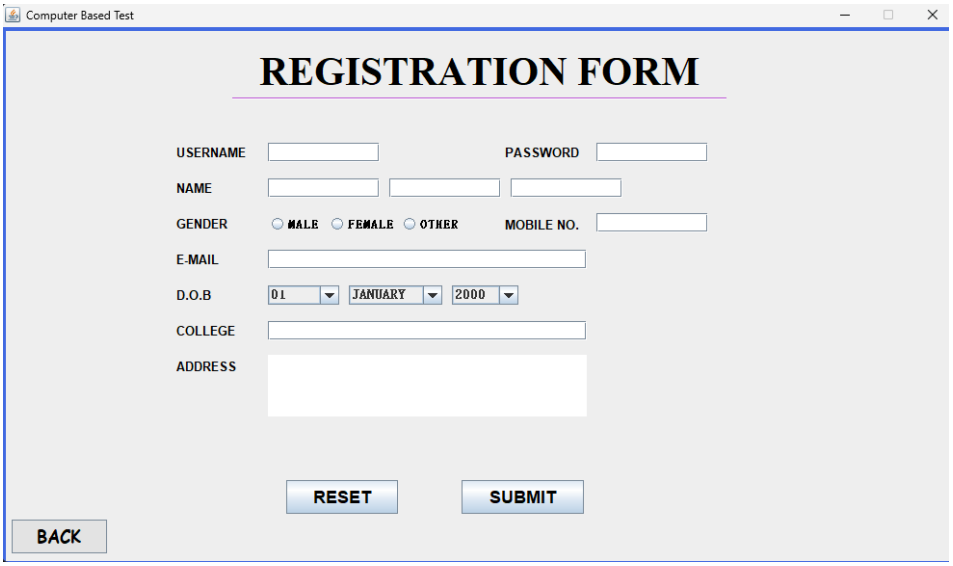

Computer Based Test
LOGIN
STUDENT
ADMIN
TEACHER
BACK

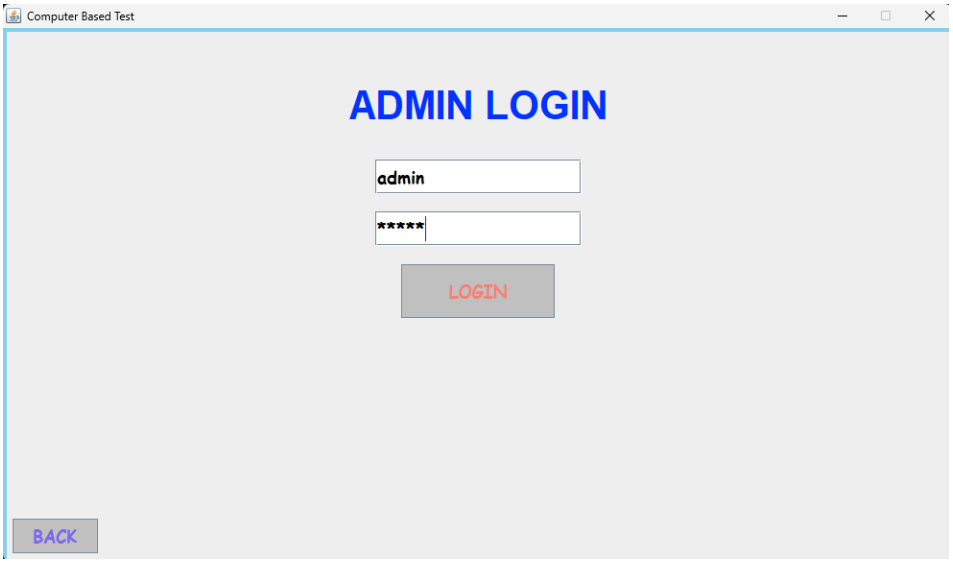

Computer Based Test
USER LOGIN
Pavankumar
****
LOGIN
Forget Password
New User :
REGISTER
BACK

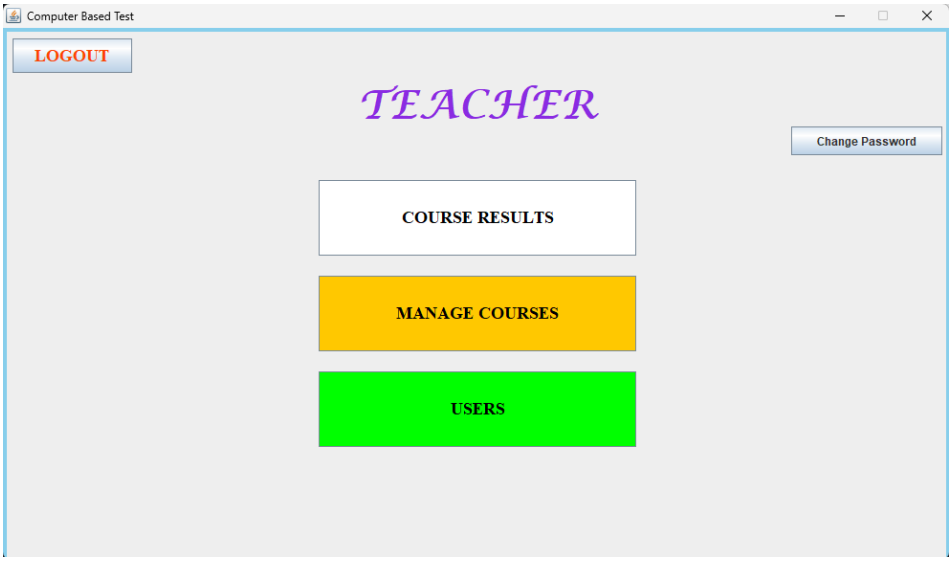

Computer Based Test
LOGOUT
EDIT DETAILS
RESULT
WELCOME Pavankumar L Hegde
SELECT COURSE
APPTITUDE
COMPUTER
OOAD
START TEST

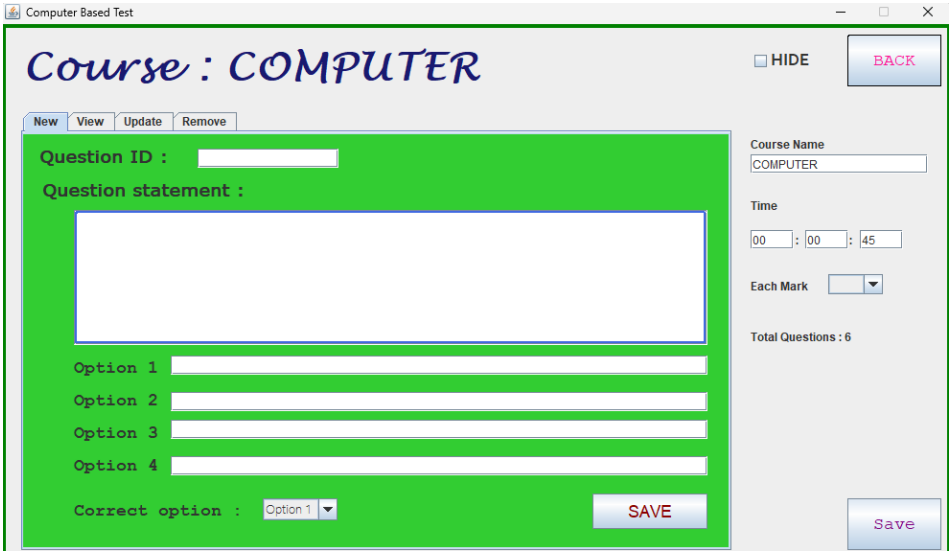

Computer Based Test
LOGOUT
EDIT DETAILS
RESULT
WELCOME Pavankumar L Hegde
SELECT COURSE
COMPUTER
START TEST
INSTRUCTIONS
1. There are total 6 questions each with 0 marks in this course.
2. Maximum time is 00:00:45 .
3. There is no negative marking for any question.
4. After time up you will be automatically logged out.
5. You can see the time left on the upper right corner.
6.Wish You All The Best.


Computer Based Test
BACK
RESULT
Username : Pavankumar
S.No
Course
Total Ques.
Attempted Ques.
Correct Ques.
Wrong Ques.
Total
1.
APPTITUDE
9
1
1
0


Computer Based Test
REGISTRATION FORM
USERNAME
PASSWORD
NAME
GENDER
MALE
FEMALE
OTHER
MOBILE NO.
E-MAIL
D.O.B
01
JANUARY
2000
COLLEGE
ADDRESS
RESET
SUBMIT
BACK


Computer Based Test
ADMIN LOGIN
admin
*****
LOGIN
BACK


Computer Based Test
LOGOUT
TEACHER
Change Password
COURSE RESULTS
MANAGE COURSES
USERS


Computer Based Test
Course : COMPUTER
HIDE
BACK
New
View
Update
Remove
Question ID :
Question statement :
Option 1
Option 2
Option 3
Option 4
Correct option :
Option 1
SAVE
Course Name
COMPUTER
Time
00 : 00 : 45
Each Mark
Total Questions : 6
Save