

Online Quiz Application System

A project submitted to

UKA TARSADIA UNIVERSITY

in partial fulfillment of the requirements for the degree of

Bachelor of Science

in

Information Technology

for

5 Years Integrated M.Sc. (IT)

By

Desai Yash Ashokkumar

202006100110086

Guided by

Ms. Jaimini Patel

Assistant Professor



Babu Madhav Institute of Information Technology

Uka Tarsadia University

Bardoli – 394350

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This is to certify that **Desai Yash A. (202006100110086)** has submitted project entitled “**Online Quiz Application System**” as the partial fulfillment for the award of the degree of Bachelor of Science in Information Technology for 5 Years Integrated M.Sc. (IT) in 2023 – 2024.

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Place: Uka Tarsadia University

Ms. Jaimini Patel

Guide

Dr. Jitendra Nasriwala

Programme Coordinator,

External Examiner



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**Babu Madhav Institute of Information
Technology, Uka Tarsadia University,
Bardoli – 394350**

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1. INTRODUCTION

1.1 Problem Definition:

The quiz application aims to provide an interactive and engaging platform for students to take quizzes, tests, and exams. However, ensuring the integrity of the quiz process is crucial. Traditional quiz applications cannot often monitor and prevent unauthorized activities such as tab switching, content copying, and other forms of cheating. This can compromise the fairness and effectiveness of the quiz process.

1.2 Project Objective:

The primary objective of developing this quiz application is to create a secure and efficient platform for conducting quizzes and exams. The application will include advanced security features to monitor and prevent unauthorized activities, ensuring that the quiz process is fair and the integrity of the quiz results is maintained. The system will also provide real-time analytics to teachers, allowing them to track student activities and identify potential cheating attempts. This will help in creating a more secure and reliable quiz environment.

1.3 Project Scope:

The Quiz Application project scope focuses on developing a secure and interactive platform for conducting quizzes and exams, with key features including user registration and authentication for students and teachers, quiz creation and management by teachers, advanced security features such as tab switching detection, content copying prevention, and webcam monitoring to ensure the integrity of the quiz process, real-time analytics and reporting for teachers to monitor student activities and identify potential cheating attempts, and a feedback mechanism for both students and teachers to provide and receive feedback on the quiz process. The system aims to enhance the quiz experience by providing a secure environment, efficient quiz management, and valuable insights for improving quiz outcomes.

1.4 Initial Requirement Document:

Title of the project	Online Quiz Management System
Stakeholders involved in capturing requirements	Student, Teacher
Techniques used for requirement capturing	Interviewing, Brainstorming
Name of the persons along with designations	--
Date	11 th Jan, 2024
Version	1.0
Users of the system	Student, Teacher, Admin
Consolidated list of initial requirements:	
<ol style="list-style-type: none"> 1. The system shall provide a secure and user-friendly interface for all users (Student, Teacher, Admin) to register and log in. 2. The system shall allow the Teacher to create and manage quizzes, including setting questions, specifying quiz duration, and setting rules and restrictions (e.g., preventing tab switching or content copying). 3. The system shall include advanced security features to monitor and prevent unauthorized activities during quizzes, such as tab switching detection, content copying prevention. 4. The system shall provide real-time analytics and reporting for Teachers to monitor student activities, identify potential cheating attempts, and analyze quiz performance. 5. The system shall enable Students to take quizzes according to the schedule set by the Teachers, and view their quiz results and performance analytics. 6. The system shall support user authentication and authorization, allowing different levels of access based on user roles (Admin, Teacher, Student). 7. The system shall include features for quiz scheduling, allowing Teachers to set specific dates and times for quizzes, and for Students to plan their study schedules accordingly. 8. The system shall include a notification system for sending reminders about upcoming quizzes, results. 9. Students will have the ability to register and log in independently. 10. Teachers will be able to add Students to the system, facilitating the management of student accounts and ensuring that only authorized students have access to the quiz platform. 11. The system shall include a feature for Teachers to conduct live quizzes, allowing for real-time interaction and immediate feedback on quiz performance. 12. The system shall be able to generate login ID and password for the admin. 13. The admin shall be able to register Teacher for the system. 14. The admin shall be able to maintain all the details of the users of the system. 15. The admin shall provide username and password to Teacher to access system. 16. Admin shall be able to see Teacher's subject performance. 	

17. Teacher shall be able to see student performance.
18. Student shall be able to access quiz within schedule time which set by teacher.

2. Overall Description:**2.1 Product Perspective/Environment Description****2.1.1 Hardware Interface/ Hardware Specification**

Utilities	Needs
RAM	1 GB
Hard Disk	1 GB
Operating System	Any browser
Display	All Screen

2.1.2 Software Interface/Software Specification

Type	Web-Based Application
Front-End	REACT JS
Back-End	NODE JS, EXPRESS JS, MONGO DB
Operating System	Windows, ubuntu or mac
Tools	Postman, VS CODE, MongoDBCompass

3. System Specific Requirement:

3.1 Functional Requirements:

3.1.1 Manage Login

3.1.2 Manage Users (Student, Teacher, Admin)

3.1.3 Manage Quizzes

3.1.4 Manage Quiz Analytics and Reporting

3.1.5 Manage Student Performance Tracking

3.1.6 Manage Notifications

3.1.7 Manage User Registration

Manage Login

RN	Description	Comments
FR1	System shall allow users (Student, Teacher, Admin) to log in securely using their credentials.	Login_Page
FR2	System shall be able to generate new password if in case user forgets his old password.	ForgotPass_Page
FR3	System shall allow users of the system to logout from the system.	All pages after Login

Manage Users (Student, Teacher, Admin)

RN	Description	Comments
FR1	System shall allow admin to register and manage Teachers.	Teacher Management Page
FR2	System shall allow Teachers to add and manage Students.	Student Management Page
FR3	System shall maintain user profiles with relevant details for each user type.	User Profile Page

Manage Quizzes

RN	Description	Comments
FR1	System shall allow Teachers to create and manage quizzes, including adding questions, options, and answers.	Quiz Creation/Management Page
FR2	System shall allow Teachers to schedule quizzes by specifying start and end times.	Quiz Creation/Management Page

Manage Quiz Analytics and Reporting

RN	Description	Comments
FR1	System shall provide real-time analytics and reporting for Teachers to monitor student activities and identify potential cheating attempts.	Teacher Analytics Dashboard

Manage Student Performance Tracking

RN	Description	Comments
FR1	System shall allow Students to view their quiz results and performance analytics.	Student Performance Dashboard
FR2	System shall allow Teachers to view individual and overall student performance for quizzes.	Teacher Performance Dashboard

Manage Notifications

RN	Description	Comments
FR1	System shall implement a notification system to send invitation of subject.	Notification System

Manage User Registration

RN	Description	Comments
FR1	System shall allow Students to register and create accounts independently.	Student Registration Page

3.2 Non-Functional Requirements:

RN	DESCRIPTION	COMMENTS
NFR1	The system shall be able to provide security to all the users of the system.	Security
NFR2	The system shall be easy to use as it shall provide easy navigation, interface, and notifications.	Usability
NFR3	The system shall be able to work on any JavaScript supported browser	Compatibility

4. System Design:**4.1 Database Design:****4.1.1 Database Schema:**

1. User (userId[PK], user_email, user_password, user_role, user_status, contact, role_id[FK referencing student or teachers])
FD -> user_email, user_password, user_role, user_status, contact
2. Subjects (subjectId[PK], Quizzes[FK referencing Quizzes], subject_name, subject_code, Teacherid[FK referencing Users])
FD -> subject_name, subject_code
3. Teachers (teacherId[PK], subject[FK referencing Subjects], teacher_name, teacher_email)
FD -> teacher_name, teacher_email
4. Quizzes (quizId[PK], Quiz_data, Quiz_ans, quiz_name, subjectid[FK referencing Subjects], Teacherid[FK referencing Users], start_time, end_time, secure_url_cvs, total_marks, passing_marks)
FD -> quiz_name, Quiz_data, Quiz_ans, start_time, end_time, secure_url_cvs, total_marks, passing_marks
5. Anaylsis(anaylsisId[PK], quizId[FK], studentId[FK], cheating_attempt_description)
FD-> cheating_attempt_description
6. Assessment(AssesmentId[PK], quizId[Fk], subjectid [FK] ,studentId[FK], result)
FD-> result
7. Notifications (notificationId[PK], student_id[FK referencing Users], student_email, role, status, date_time, Last_activity, token_id, subject[FK referencing Subjects], teacher_id[FK referencing Users])
FD -> student_email, role, status, date_time, token_id, Last_activity

4.1.2 Data Dictionary:**1. User**

SR No.	Field Name	Datatype	Size	Constraints	Description
1	User_id	int	-	Primary Key	Stores Id of particular user
2	User_email	varchar	100	Not Null	Email of particular user
3	User_password	varchar	255	Not Null	Password of the user
4	User_role	int	-	Not Null	Role of user
5	User_status	varchar	50	Not Null	Status of user
6	contact	varchar	10	Not Null	Contact of the user
7	Role_id	Int	-	Foreign Key	Role id of user

2. Subjects

SR No.	Field Name	Datatype	Size	Constraints	Description
1	subjectId	int	-	Primary Key	Stores Id of subject
2	QuizId	int	-	Foreign Key	Store of Quiz id
3	Subject_name	varchar	50	Not Null	Name of subject
4	Subject_code	varchar	255	Not Null, Unique	Subject code
5	Teacherid	varchar	50	Foreign Key	Stores Teacher id

3. Teachers

SR No.	Field Name	Datatype	Size	Constraints	Description
1	teacherId	int	-	Primary Key	Stores Id of Teacher
2	subjectId	Int	-	Foreign Key	Store subject id of teacher
3	Teacher_name	varchar	50	Not Null	Name of teacher
4	Teacher_email	varchar	255	Not Null	Email of Teacher

4. Quizzes

SR No.	Field Name	Datatype	Size	Constraints	Description
1	quizId	int	-	Primary Key	Stores Id of quiz
2	Quiz_Data	varchar	50	Not Null	Quiz data(question)
3	Quiz_ans	varchar	255	Not Null	Quiz answer
4	Quiz_name	varchar	255	Not Null	Quiz name
5	subjectId	varchar	50	Not Null	Subject id of subject
6	TeacherId	Int	-	Not Null	Teacher id
7	Start_time	Varchar	50	Not Null	Start time of quiz
8	End_time	Varchar	50	Not Null	End time of quiz
9	Secure_url_cvs	Varchar	255	Not Null	Csv cloud link
10	Total_marks	Int	-	Not Null	Total marks of quiz
11	Passing_marks	Int	-	Not Null	Passing marks

5. Anaylsis

SR No.	Field Name	Datatype	Size	Constraints	Description
1	anaylsisId	int	-	Primary Key	Stores Id of anaylsis
2	quizId	varchar	255	Foreign Key	Stores id of quiz
3	studentId	varchar	255	Foreign Key	Stores id of student
4	cheating_attempt_description	varchar	255	Not Null	Cheating description

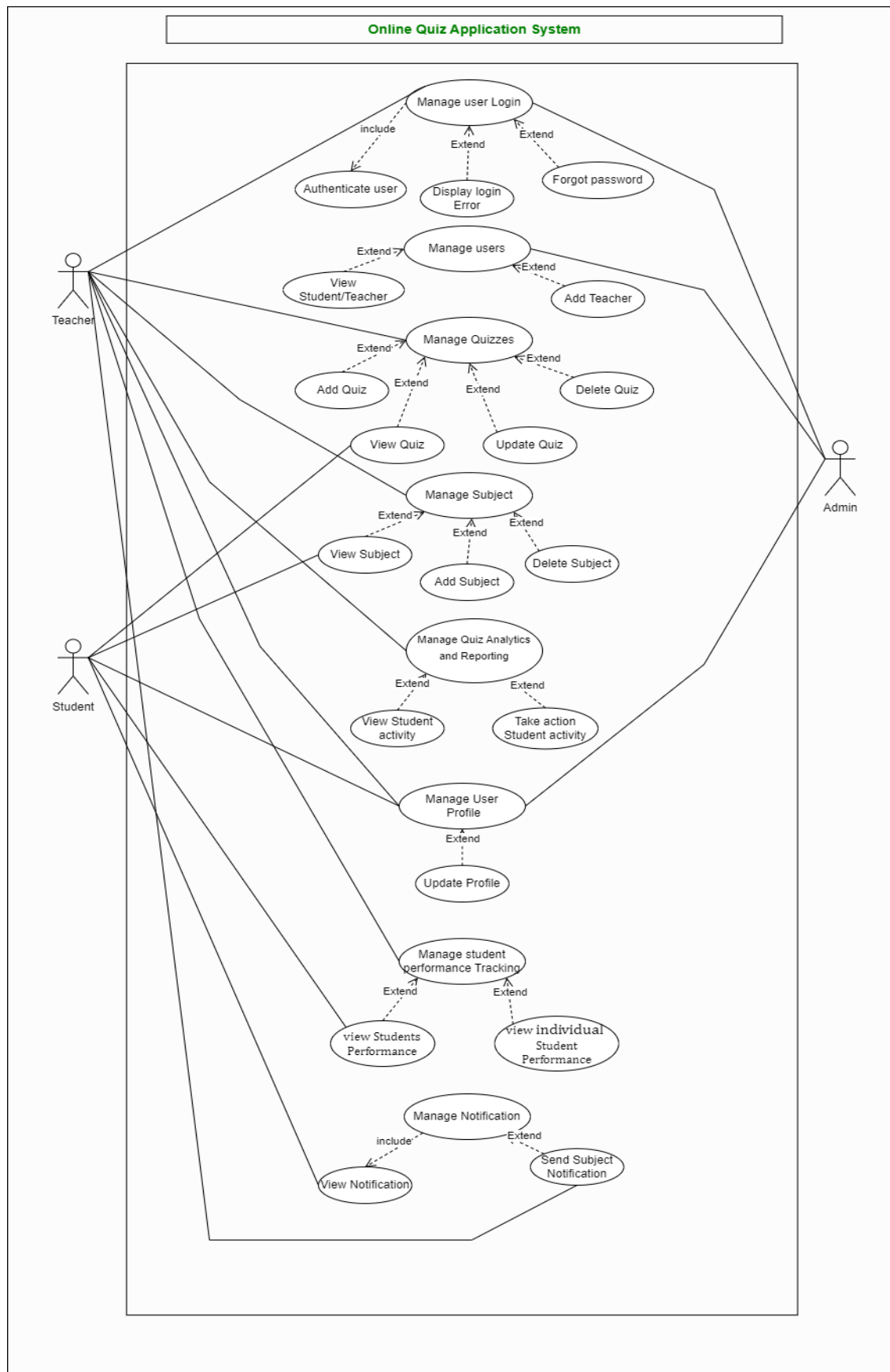
6. Assessment

SR No.	FieldName	Datatype	Size	Constraints	Description
1	AssesmentId	int	-	Primary Key	Stores Id of assesmentid
2	quizId	int	-	Foreign Key	Stores id of quiz
3	subjectid	int	-	Foreign Key	Stores id of subject
4	studentId	int	-	Foreign Key	Stores id of student
5	result	Int	-	Not Null	Stores result of student

7. notifications

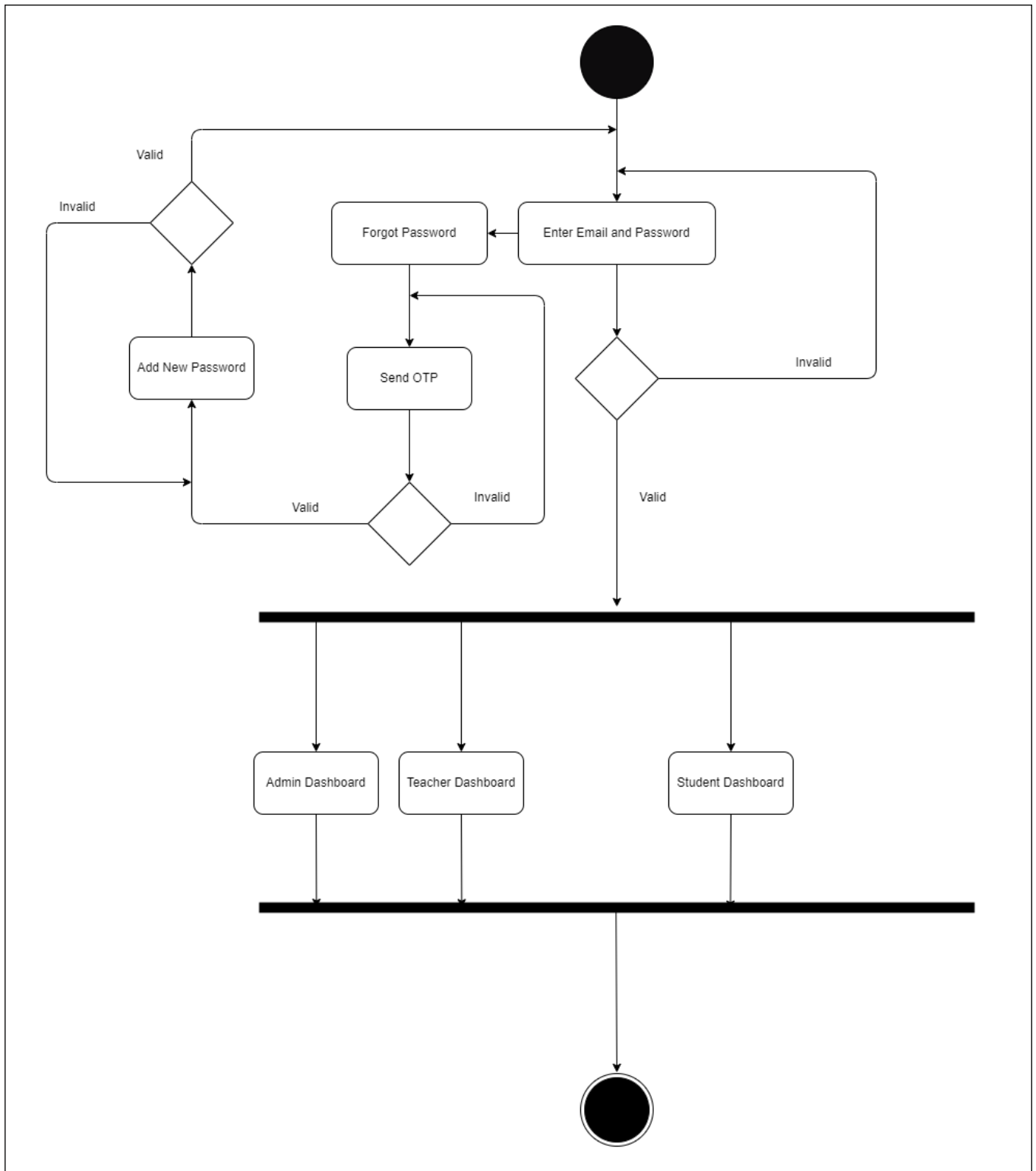
SR No.	Field Name	Datatype	Size	Constraints	Description
1	notificationId	int	-	Primary Key	Stores Id of notification
2	student_id	int	-	Foreign Key	Id of student
3	student_email	varchar	50	Not Null	Student email
4	role	int		Not Null	Store role
5	status	Int	-	Not Null	Status of notification
6	date_time	Varchar	50	Not Null	Store date and time
7	Last_activity	Varchar	100	Not Null	Last activity
8	token_id	Varchar	255	Not Null	Token id
9	subject	Varchar	50	Foreign Key	Store subject name
10	teacher_id	Int	-	Foreign Key	Store teacher id

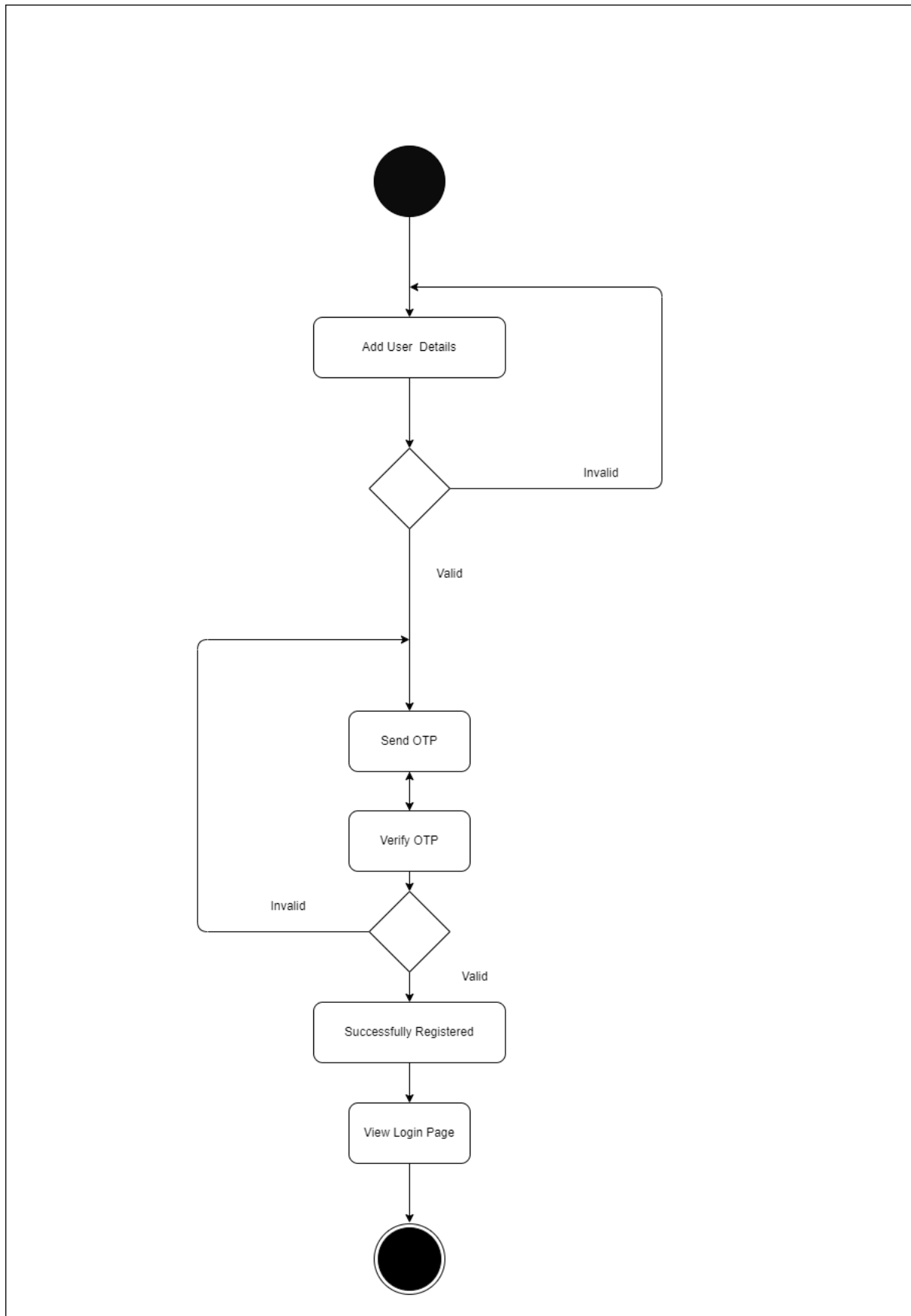
5.1 Use Case Diagram:



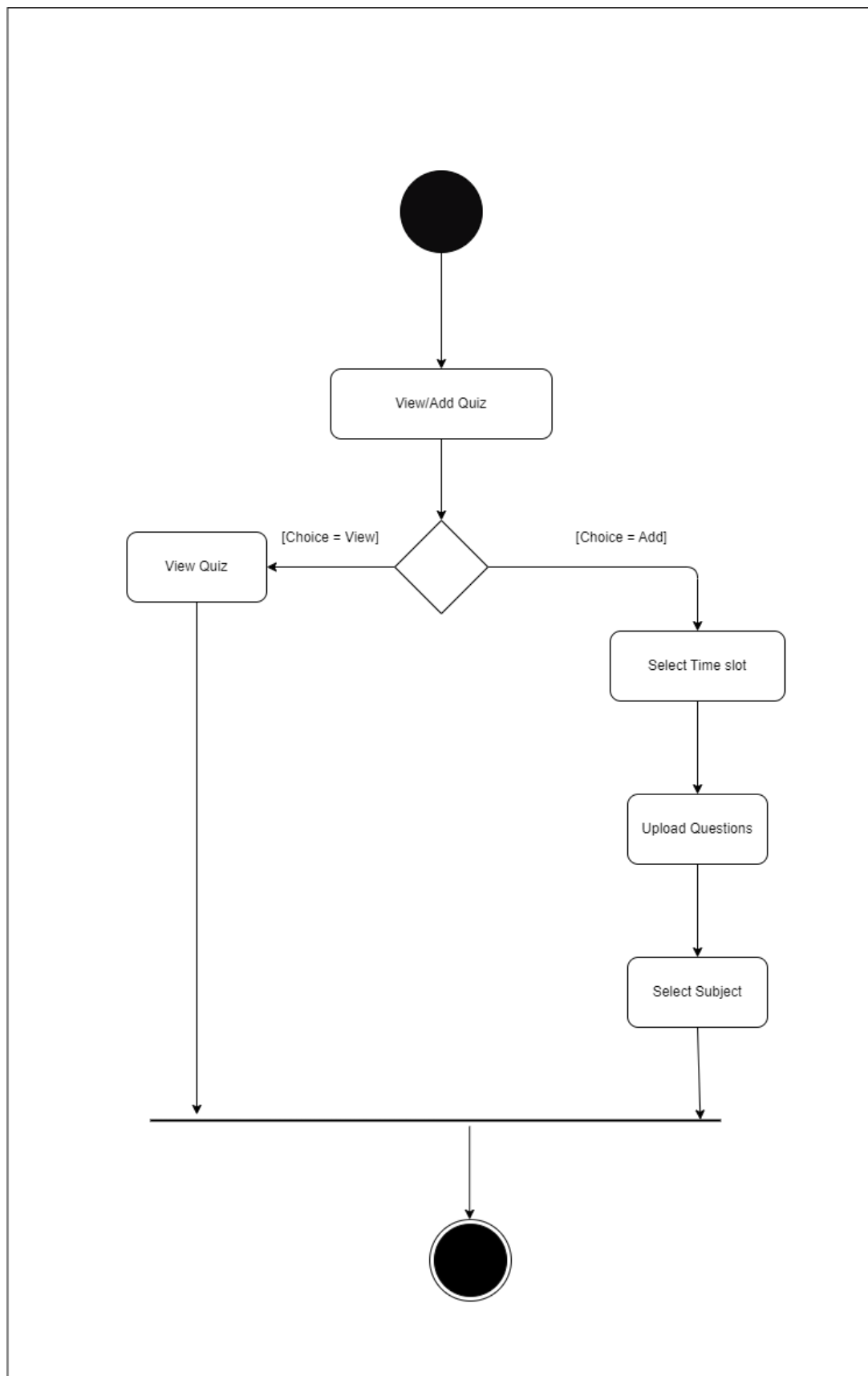
5.2 Activity Diagram

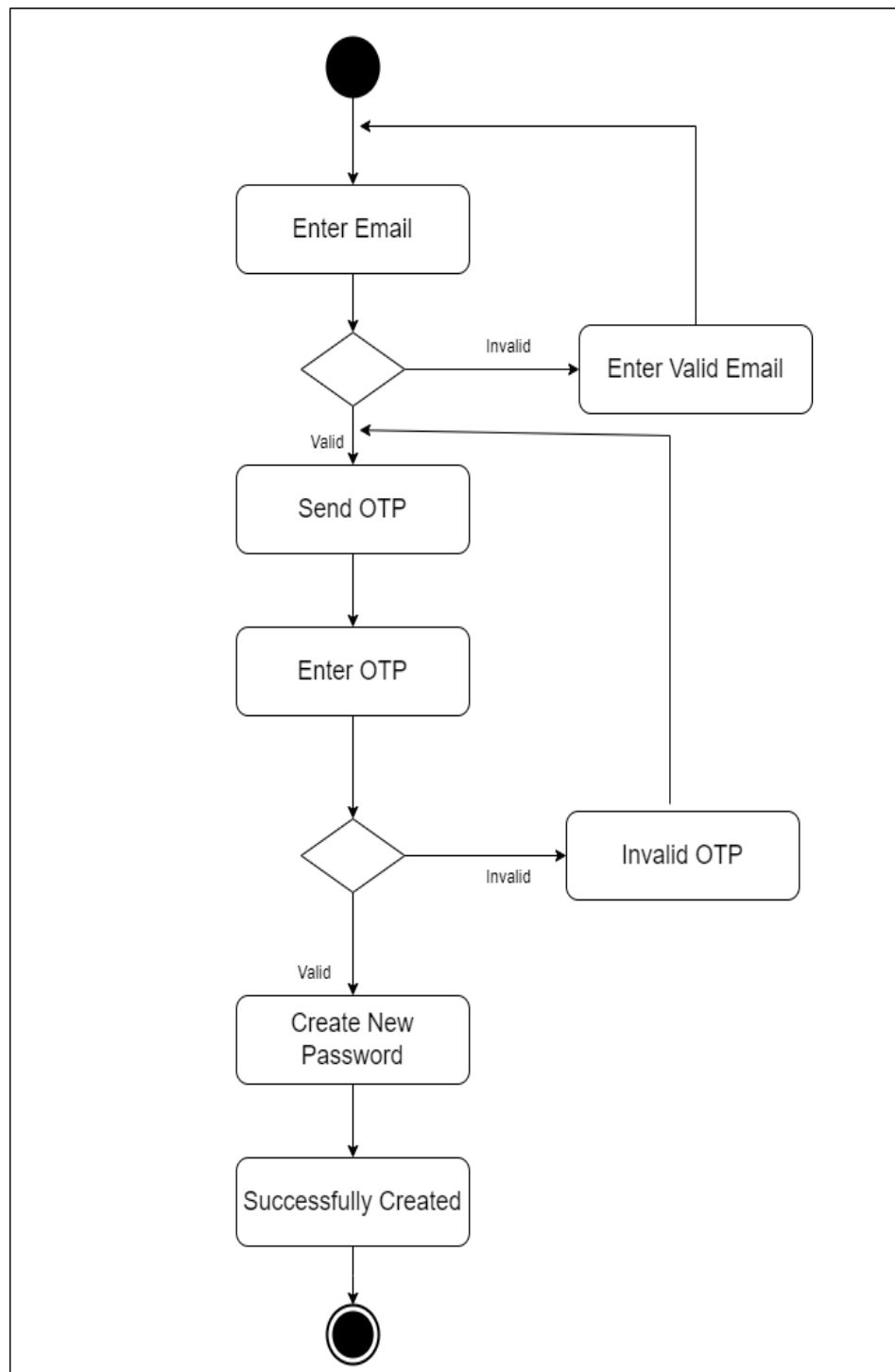
5.2.1 Activity Diagram for Login

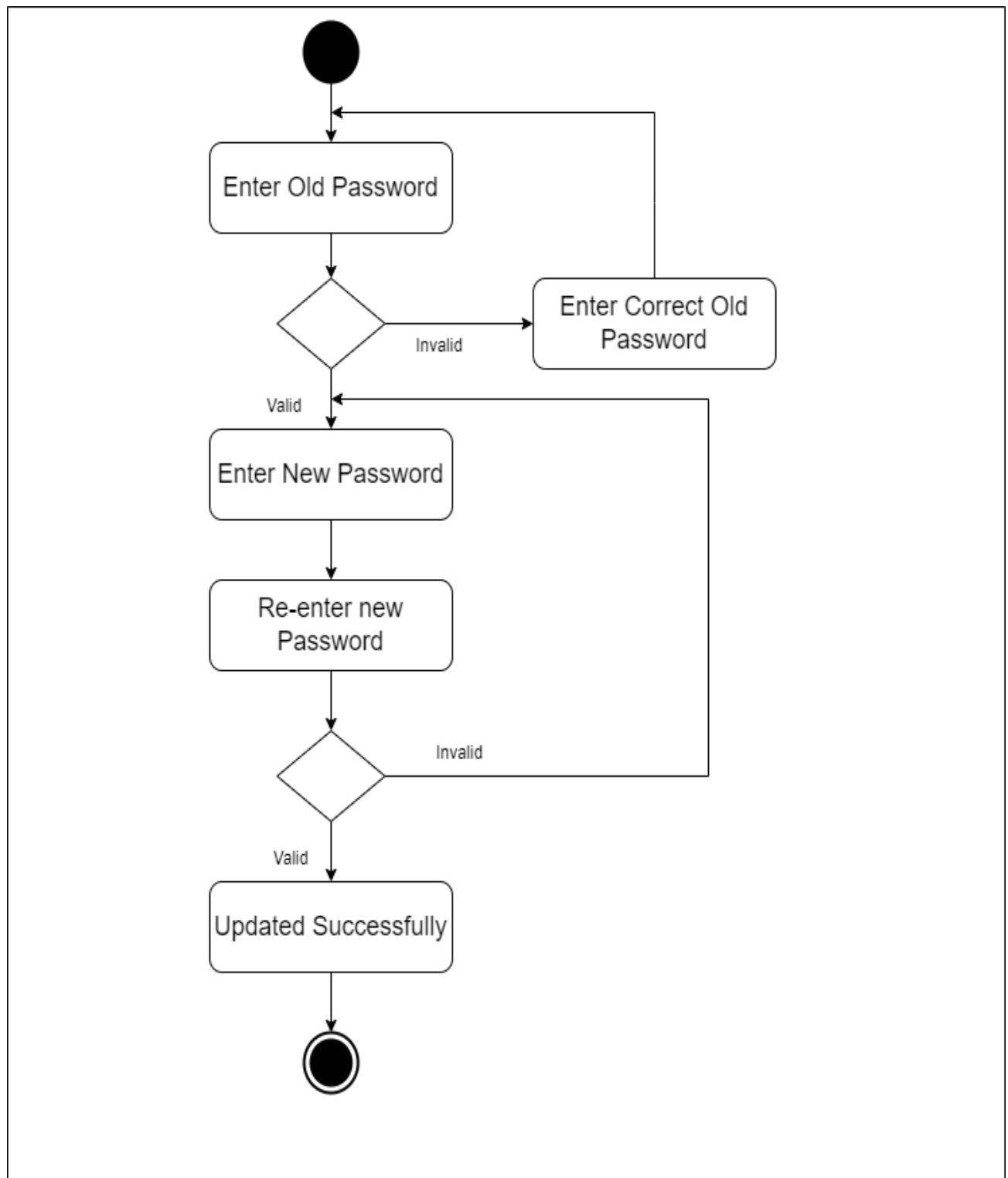


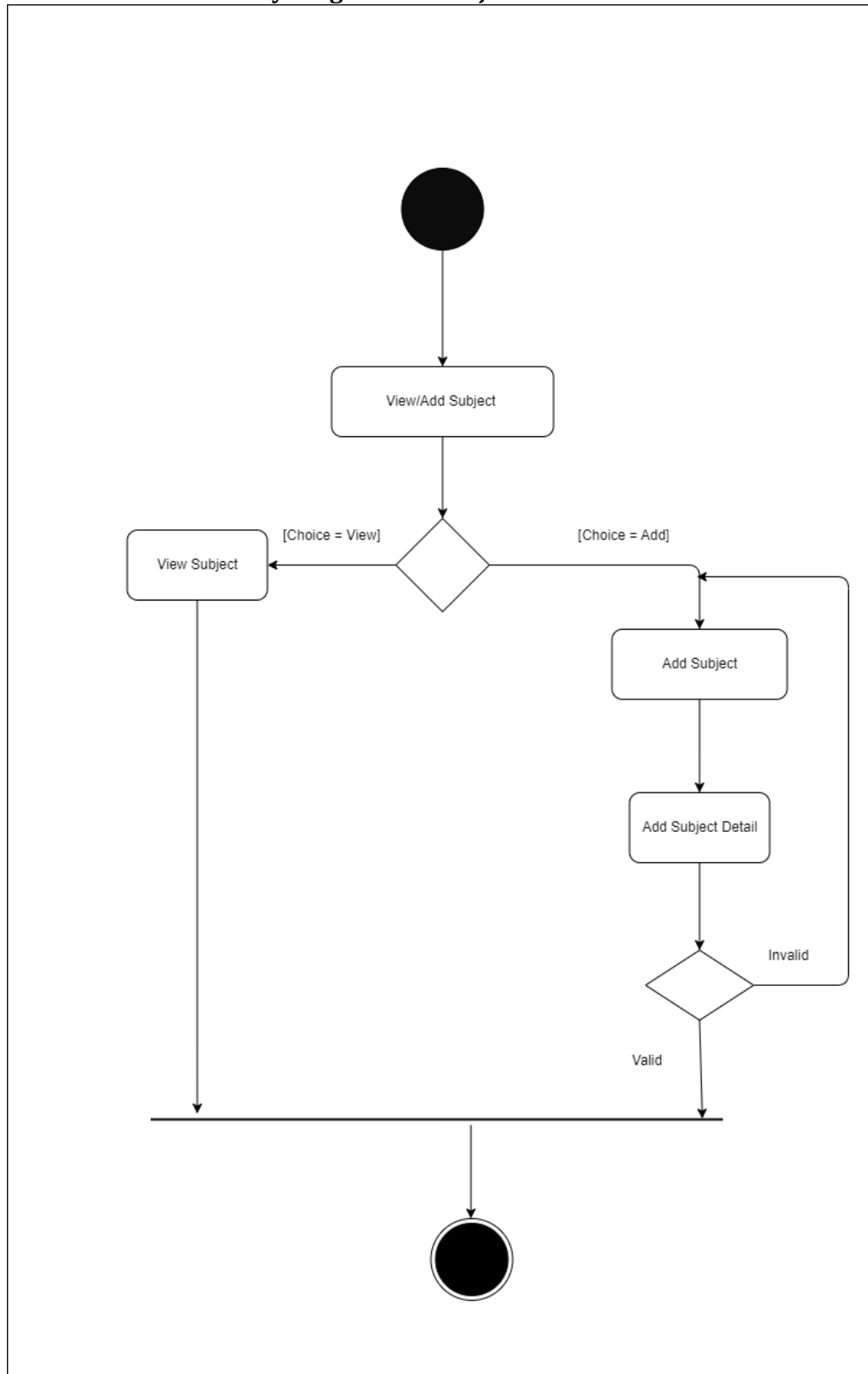
5.2.2 Activity Diagram for Registration:

5.2.3 Activity Diagram for Quiz :

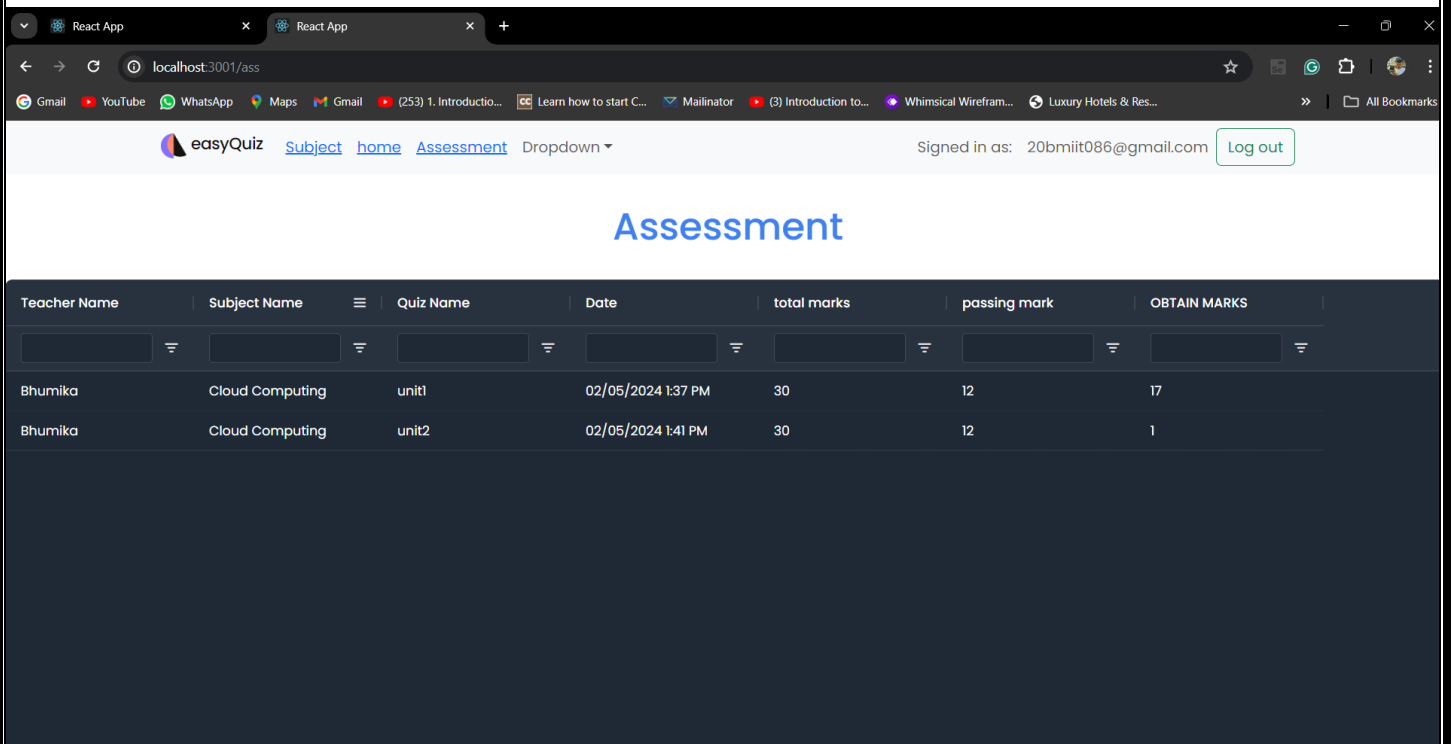


5.2.4 Activity Diagram for Forgot Password:

5.2.5 Activity Diagram for Change Password:

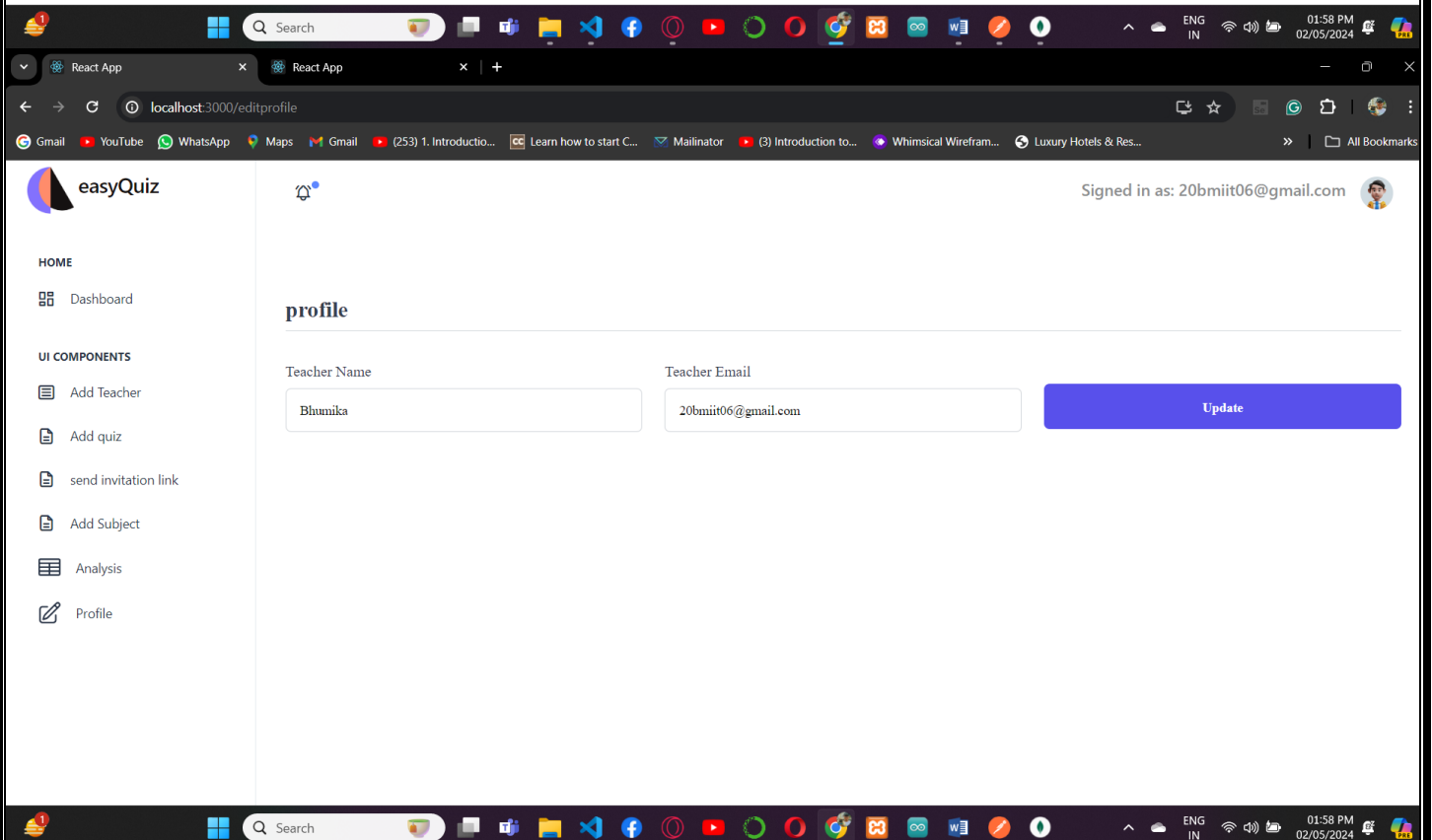
5.2.6 Activity Diagram for Subject

6. Screenshots

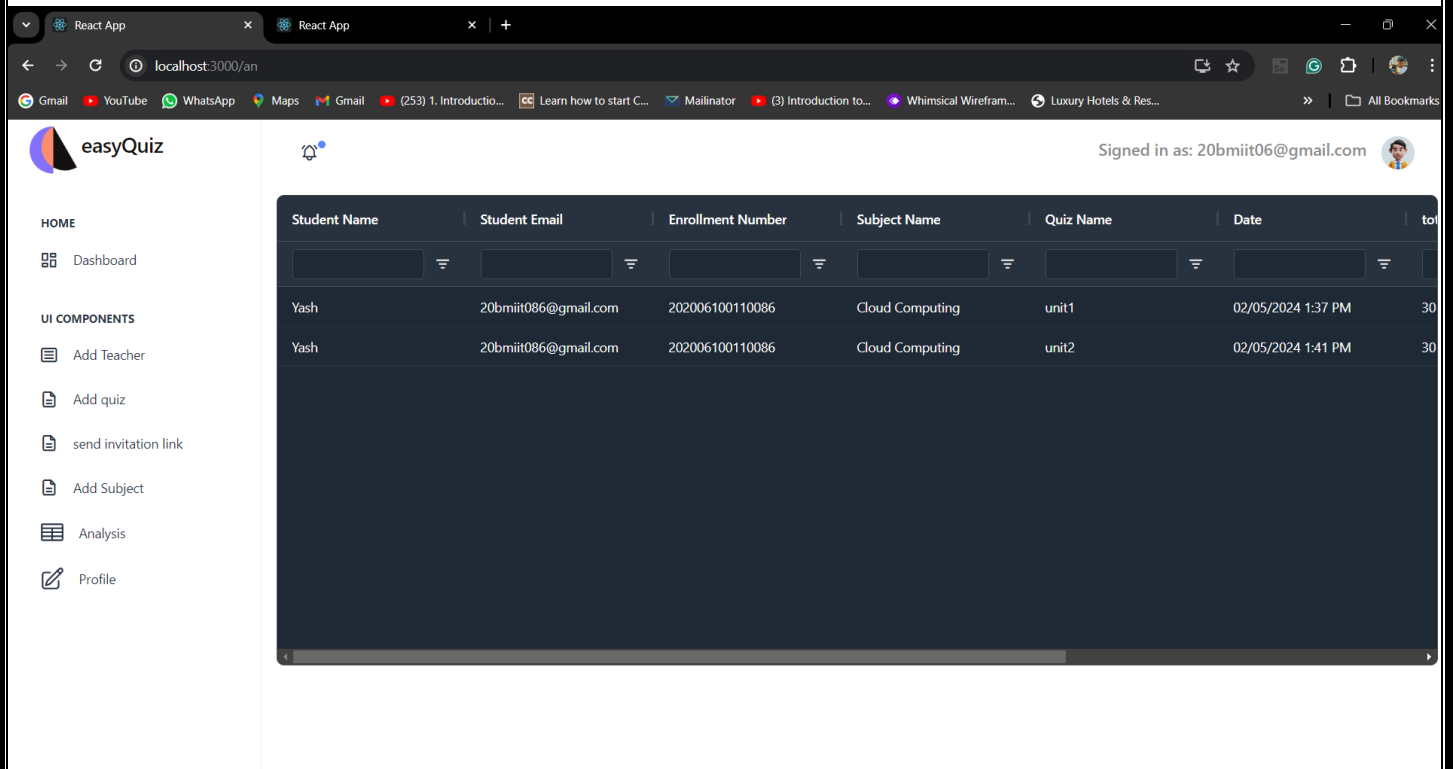


The screenshot shows the 'Assessment' page of the easyQuiz application. The browser address bar indicates the URL is localhost:3001/ass. The page header includes the easyQuiz logo, navigation links (Subject, home, Assessment), a dropdown menu, and a 'Signed in as: 20bmiit086@gmail.com' status with a 'Log out' button. The main content area features a table with the following data:

Teacher Name	Subject Name	Quiz Name	Date	total marks	passing mark	OBTAIN MARKS
Bhumika	Cloud Computing	unit1	02/05/2024 1:37 PM	30	12	17
Bhumika	Cloud Computing	unit2	02/05/2024 1:41 PM	30	12	1

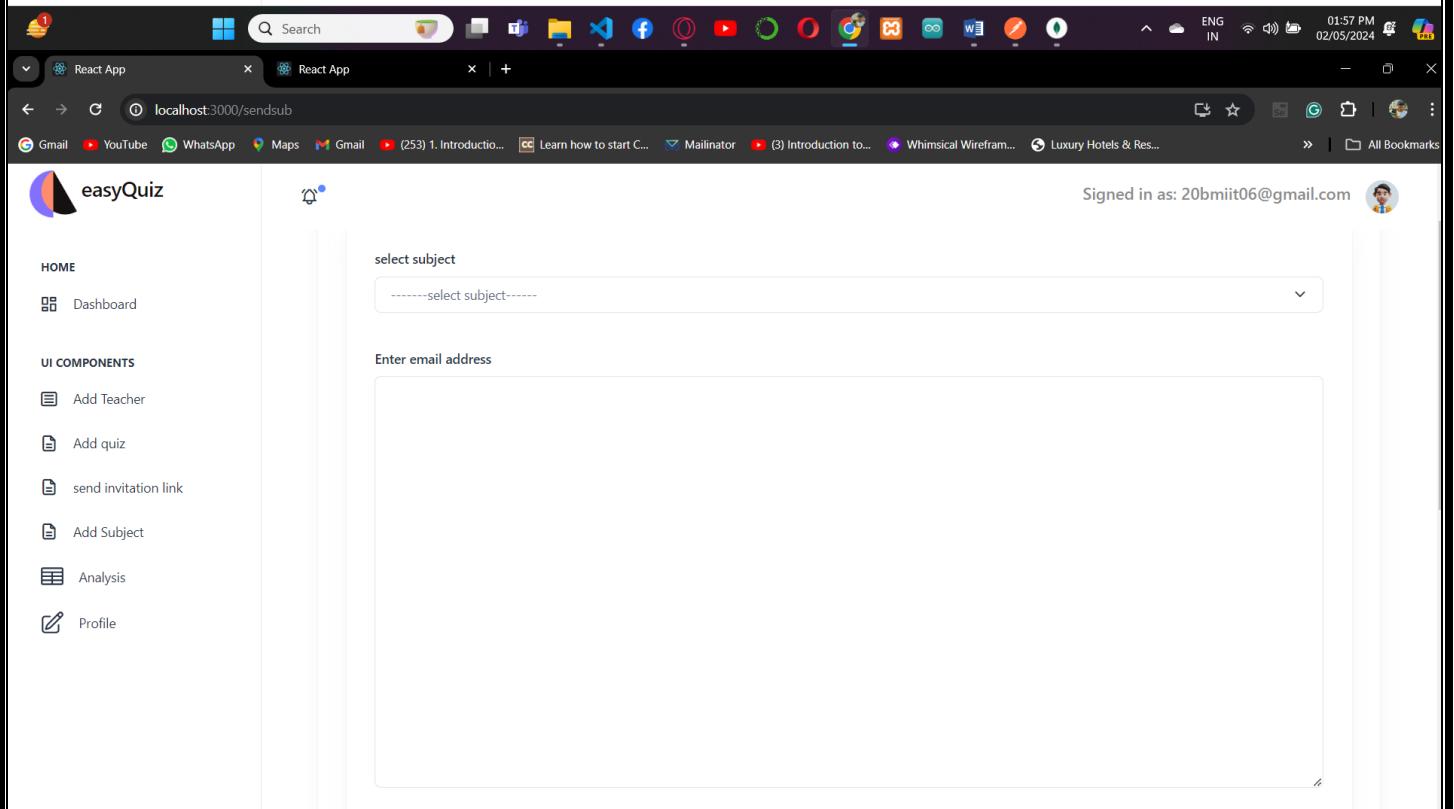


The screenshot shows the 'editprofile' page of the easyQuiz application. The browser address bar indicates the URL is localhost:3000/editprofile. The page header includes the easyQuiz logo, a notification bell, and a 'Signed in as: 20bmiit06@gmail.com' status with a user profile picture. The left sidebar contains a 'HOME' section with a 'Dashboard' link and a 'UI COMPONENTS' section with links for 'Add Teacher', 'Add quiz', 'send invitation link', 'Add Subject', 'Analysis', and 'Profile'. The main content area is titled 'profile' and contains two input fields: 'Teacher Name' (with the value 'Bhumika') and 'Teacher Email' (with the value '20bmiit06@gmail.com'). An 'Update' button is located to the right of these fields.



The screenshot shows the 'easyQuiz' application dashboard. The left sidebar contains navigation links: HOME, Dashboard, UI COMPONENTS, Add Teacher, Add quiz, send invitation link, Add Subject, Analysis, and Profile. The main content area displays a table with the following data:

Student Name	Student Email	Enrollment Number	Subject Name	Quiz Name	Date	Score
Yash	20bmiit086@gmail.com	202006100110086	Cloud Computing	unit1	02/05/2024 1:37 PM	30
Yash	20bmiit086@gmail.com	202006100110086	Cloud Computing	unit2	02/05/2024 1:41 PM	30



The screenshot shows the 'easyQuiz' application 'sendsub' form. The left sidebar is identical to the dashboard. The main content area contains a 'select subject' dropdown menu with the text '-----select subject-----' and a 'Enter email address' text input field.

React App | React App | +

localhost:3000/addsubject

easyQuiz

Signed in as: 20bmiit06@gmail.com

HOME

- Dashboard

UI COMPONENTS

- Add Teacher
- Add quiz
- send invitation link
- Add Subject
- Analysis
- Profile

Forms

Subject name

Subject Code

submit

React App | React App | +

localhost:3000/addquiz

easyQuiz

Signed in as: 20bmiit06@gmail.com

HOME

- Dashboard

UI COMPONENTS

- Add Teacher
- Add quiz
- send invitation link
- Add Subject
- Analysis
- Profile

Select date and time: none

Select End Date and Time

Selected date and time: None

☐ Can't check this

Submit

Subject_name	Id	Quiz_name	Start_time	End_time	Secure_url_cvs
Cloud Computing	663348634d2c7b37d4bf4...	unit1	02/05/2024 12:00 AM	18/05/2024 12:00 AM	https://res.cloudin
Cloud Computing	663349054d2c7b37d4bf4...	unit2	02/05/2024 12:00 AM	17/05/2024 12:00 AM	https://res.cloudin
Intorduction to iOS	6633497d4d2c7b37d4bf4...	iosunit1	02/05/2024 12:00 AM	16/05/2024 12:00 AM	https://res.cloudin

easyQuiz

Signed in as: 20bmiit06@gmail.com

HOME

- Dashboard

UI COMPONENTS

- Add Teacher
- Add quiz
- send invitation link
- Add Subject
- Analysis
- Profile

Cloud Computing - unit2

Pass

Fail

easyQuiz

[Subject](#) [home](#) [Assessment](#) Dropdown

Login

Get Started

Already have an account? [Sign in](#)

Name

enrollment number

Email

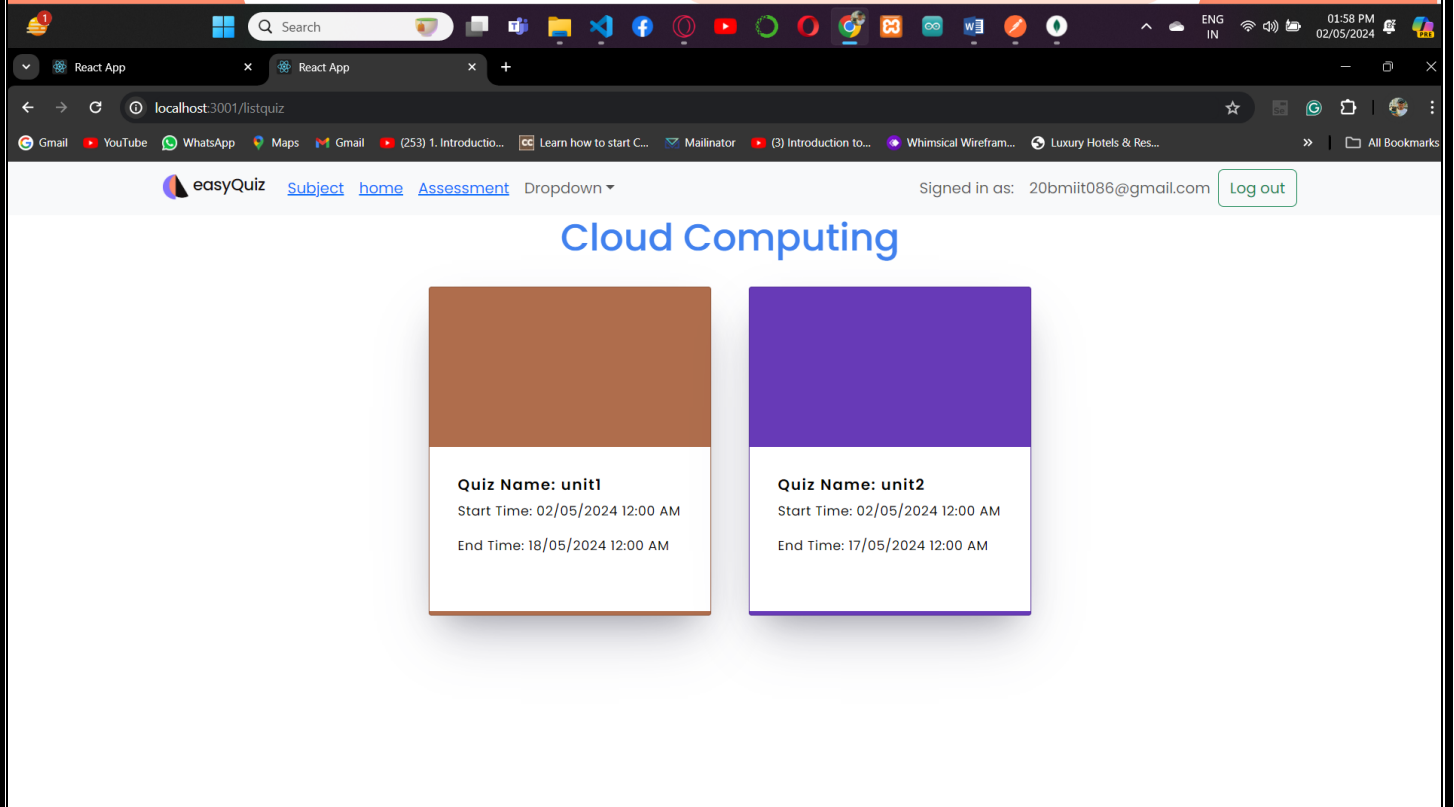
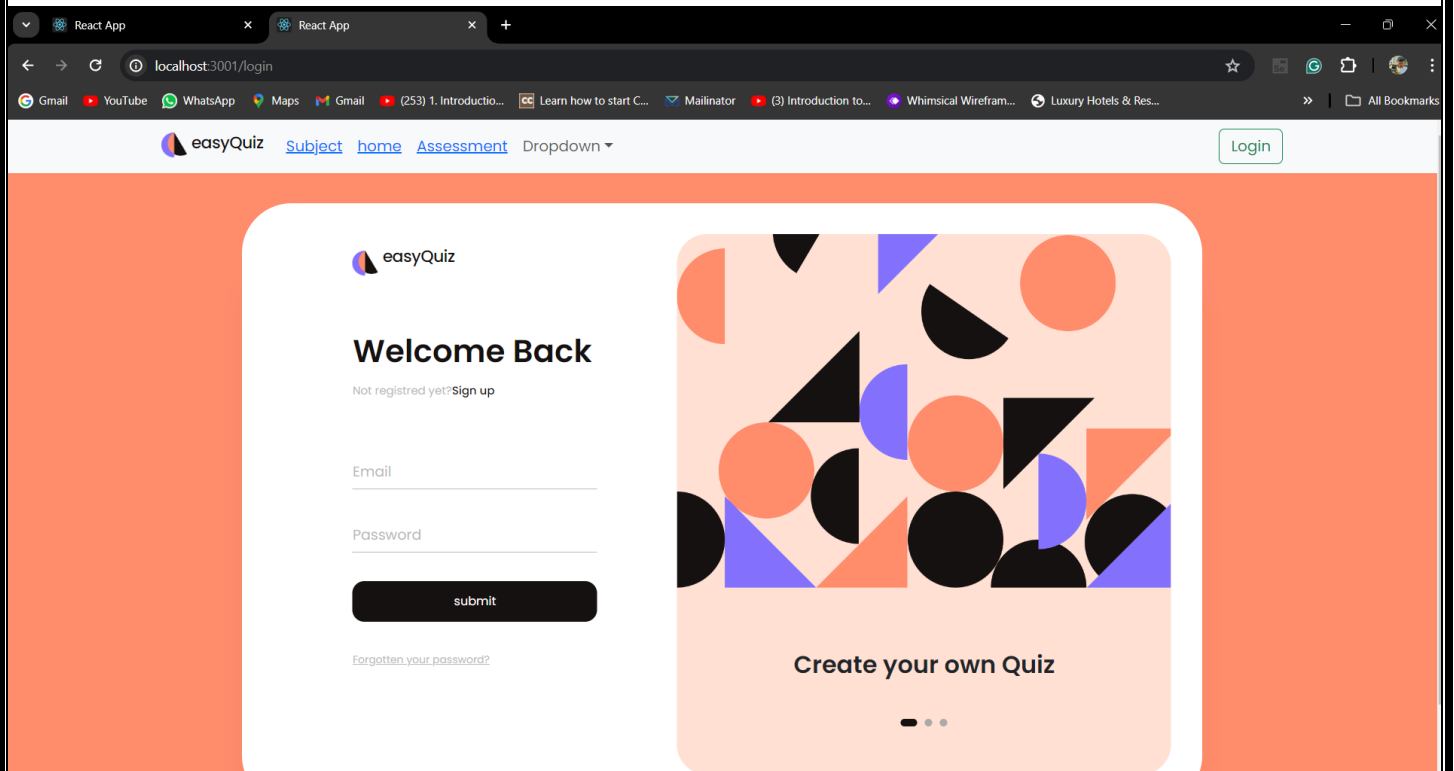
Password

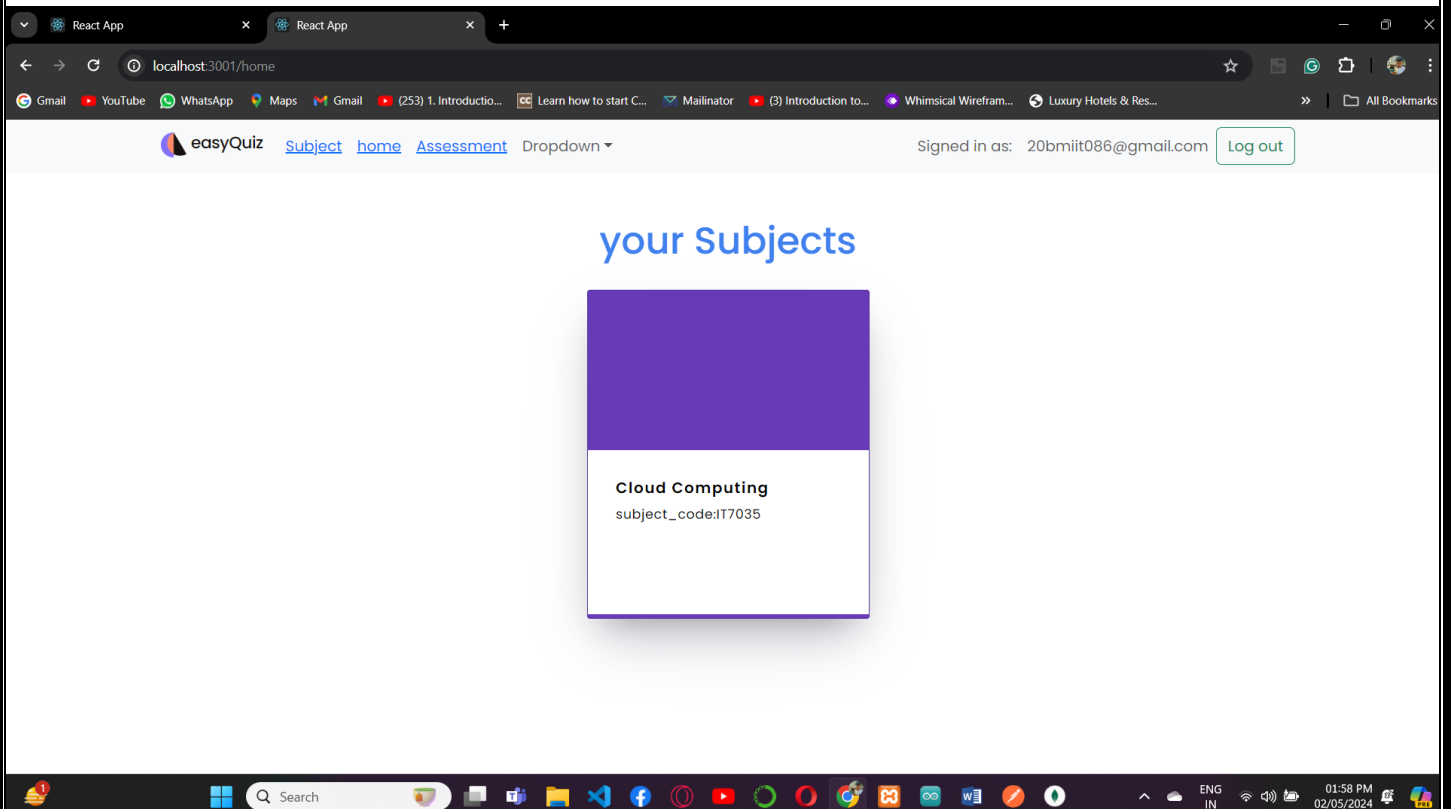
confirm password

Submit

By signing up, I agree to the [Terms of Services](#) and [Privacy Policy](#)

Create your own Quiz





7. Test Cases:

7.1 Test case for Student registration:

SR No.	Test Description	Input Value	Expected Value	Actual Value	Result
1	Check if first name accepts number or not.	Yash123	Invalid	Invalid	Pass
2	Check contact number accepts char or not.	8388abc	Invalid	Invalid	Pass
3	Check contact number accepts empty value or not.	[Empty]	Invalid	Invalid	Pass
4	Check if email is in correct format or not.	abv@	Invalid	Invalid	Pass
5	Check password matches pattern or not.	abc@124	Invalid	Invalid	Pass

7.2 Change Password

SR No.	Test Description	Input Value	Expected Value	Actual Value	Result
1	Check if current password entered is in correct format or not.	Yash123	Valid	Valid	Pass
2	Check if password takes empty input or not.	[Empty]	Invalid	Invalid	Pass
3	Check if confirm password takes empty input or not.	[Empty]	Invalid	Invalid	Pass