The e-MCQ System

Author and Developer :
ADITYA ANAND
B.Tech ECE
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IIIT Allahabad
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1. Introduction

1.1 Purpose

The purpose of this document is to present a detailed description of the designs of the MCQ Test Simulation System, created as a part of the Database Management course project. This document the software structure, its components, interfaces and the data necessary to understand the working and implementation of the software. By the end of this document, the reader would be having a fair idea about the entire flow of events, the components, the structure and the interfaces of the software which is to be developed. This document is intended for the programming group of the software team,to use the designs as guidelines to implement the project. Equally, this document is also for the team's instructor, as it fulfils one of the requirements of the project. Lastly, this document could be used for designers who try to upgrade or modify the present design of the inventory system.

1.2 Scope

This document gives a detailed description of the database architecture of the MCQ Test Simulation system. It specifies the structure and design of some of the modules discussed in the database. The Entity Relationship diagrams is for the programming team to guide them in implementing a specific module.

2. System Overview

The MCQ Test Simulation is a platform to gain knowledge on various topics though multiple choice questions. The software allows a user to participate in challenges hosted by a person / an organisation. The web application may also be used as a tool for recruitment by conducting private challenges to test the skills of the participating candidates.

The functionalities of the e-mcq simulation system are as follows:

1. Registration of the candidate by asking his/her credentials.After asking for the details and than storing these details in the database.When the user Logs in with his/her credentials to enter the dashboard these details are matched with the details in the database to verify that the candidate is a valid one..

2. Participate in Test in the contest arena. One may gain access to private challenges by directly entering the contest slug (URL address).

3. Apply to become a setter in the setter section. Once granted the access, you may create new open/private challenges and control the runtime of the contest.

4. Administrators have to accept the setter requests and keep a check on the quality of questions being asked in the contests.

The main modules included in the software are:

1. User - A standard user can access functionalities 1 to 4.
2. Setter - A setter is a user with 4th functionality granted. He may create challenges .
3. Admin - Administrator has supreme access to all the functionalities of the software.

Technologies used:

1. FrontEnd : HTML, CSS, Javascript
2. BackEnd : Python, Flask
3. Database : MySQL

3. System Architecture

3.1 Architectural Design

The MCQ Test Simulation software is divided into 3 main modules, namely User, Setter and Admin. Every module registered to the MCQ web application is a User. A Setter is also a User with some additional facilities like creating a challenge and setting new questions for the participants. Admin is a User with the responsibility to accept setter requests. Admin also has access to create a challenge.

1. User(Candidate Portal) - The most basic module of the software. Every registered person to the application may be classified as a User. A User may practice problems in the Practice section. Problems may be sorted topic wise and according to their difficulty level. Successful attempt to a question fetches user some points which adds to their total score. The total score is

used to display the ranking of a User in the Overall Leaderboard. In the contest section, the User may view the open challenges available to participate. Access to private challenges can be done via entering the direct address to the contest page. A User has to update his information such as contact information, education, etc. in the profile section. A User may apply to become a setter with certain Description.

2. Setter - A User with additional responsibilities of creating and managing new contests.challenges. A contest (or challenge) may be open - meaning all Users may participate in the contest, or private - meaning only certain Users with the contest URL may participate in the challenge. A Setter may control the running time of the contest i.e he may start or end the contest as necessary.

3. DBA (Admin) - A User with supreme access to the application is the Admin. Admin is a User managing the entire web application once deployed. Admin has the responsibility to grant a User the responsibility of a Setter, Admin may also take back the responsibility of a Setter or ban a User.

4. Data Design

Data Description

In this section we describes the way the system is structured and the purpose and function of each entity like user, setter, admin, questions, contests. Various Data entities are as described:

1. Users : Users contains data of all the user logging into the system, having their
email id as their primary key. We will save their name, gender, email address, contact number, date of birth etc.

2. Problems : The problems published will be saved with their id or question number as the primary key, question, options (A,B,C,D).They will also contain the correct answer of each question as well as the marks corresponding to the questions.

3. Leaderboard : The leaderboard table will maintain the record of the rankings of the paper aspirants.It contains the username as the foreign key which references to a valid user from the users table and the obtained marks of each user sorted in the order of their marks.

5. ER Diagram
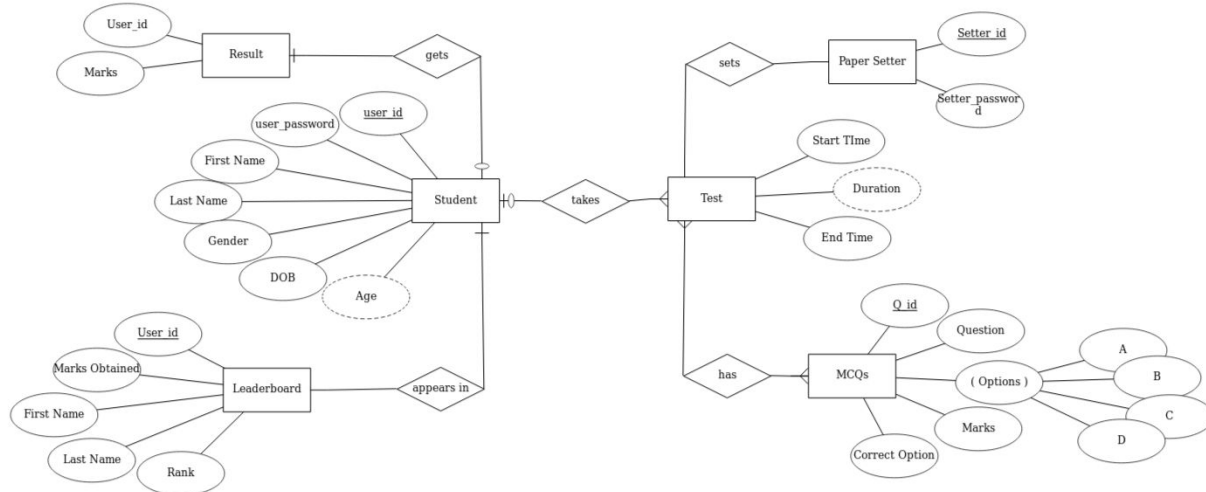
6. Activity Diagram
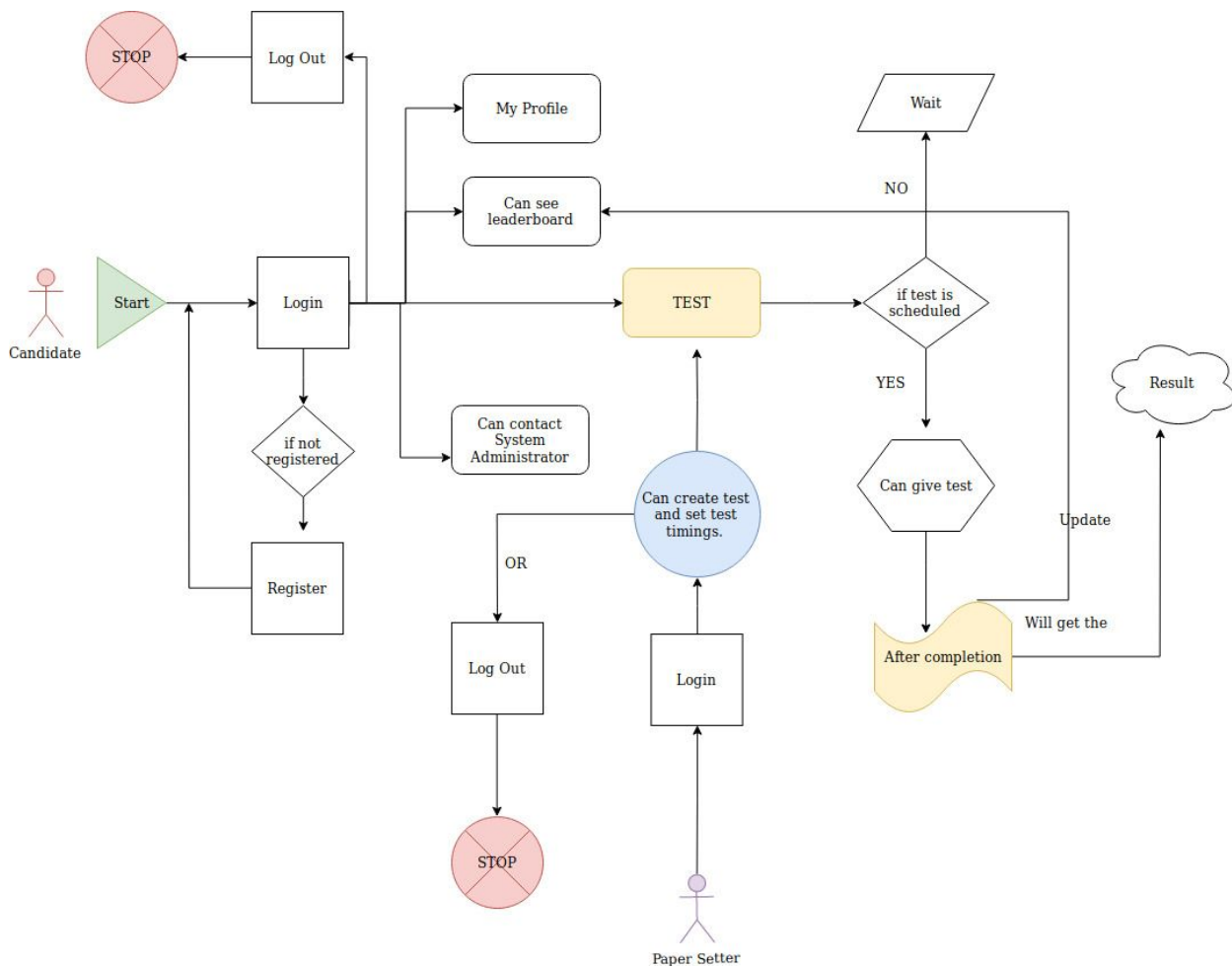
7. Interface Description

User Interface Description

1. Login Page* : Any User has to first login to his account by entering the valid credentials.. A User may register to the application by clicking on register button.

2. The Test Area : After the user has logged in,he will be directed to the test arena where he will be facing number of multiple choice questions one at a time.
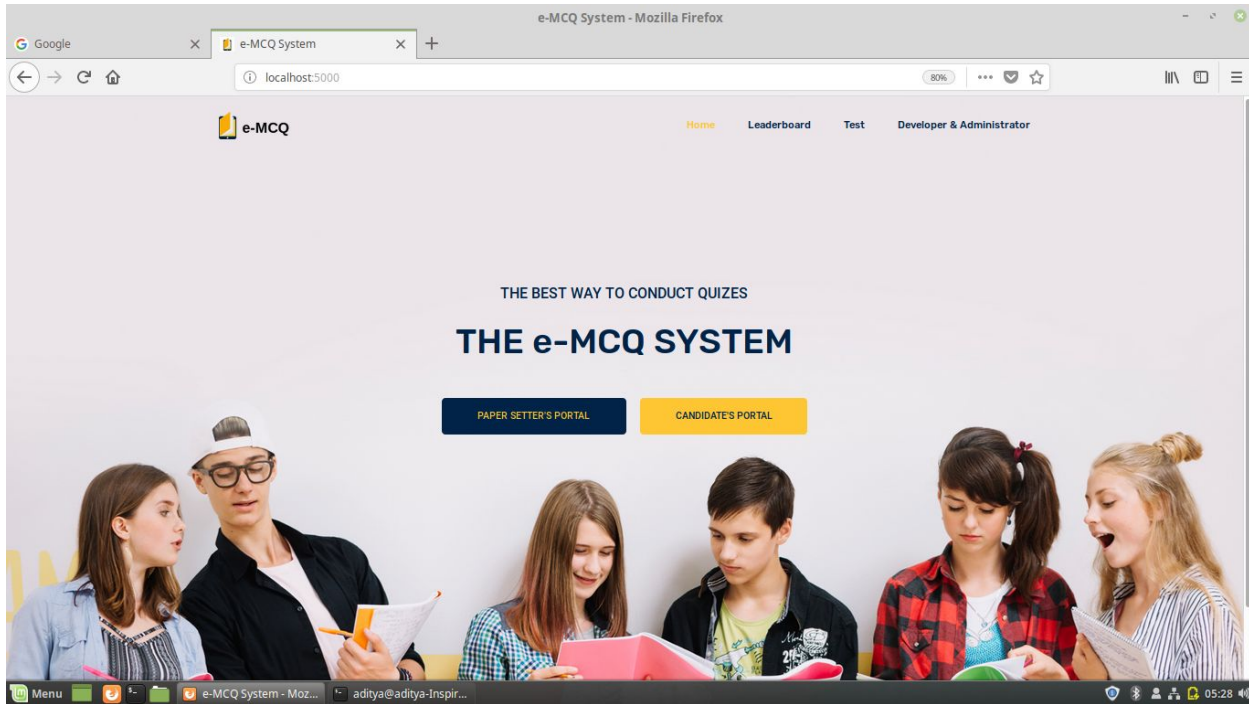
3. User Profile Page : Displaying the personal details of the user i.e his/her name, email address, username, date of birth, gender etc.

4. Setter : The paper setter portal has a default username and password through which any paper setter logs into the portal. The paper setter has various functionalities to perform i.e he can add, delete, edit the questions. Also he can set the test timings and has the privileges to clear the clear the leaderboard before the test starts.

5. Result : The result section displays the final result of the user i.e. marks scored by the user out of the total marks of the test as soon as the user finishes his/her test or the timer expires i.e the test time finishes.

Here are some screenshots of the implemented login system:

1. Homepage
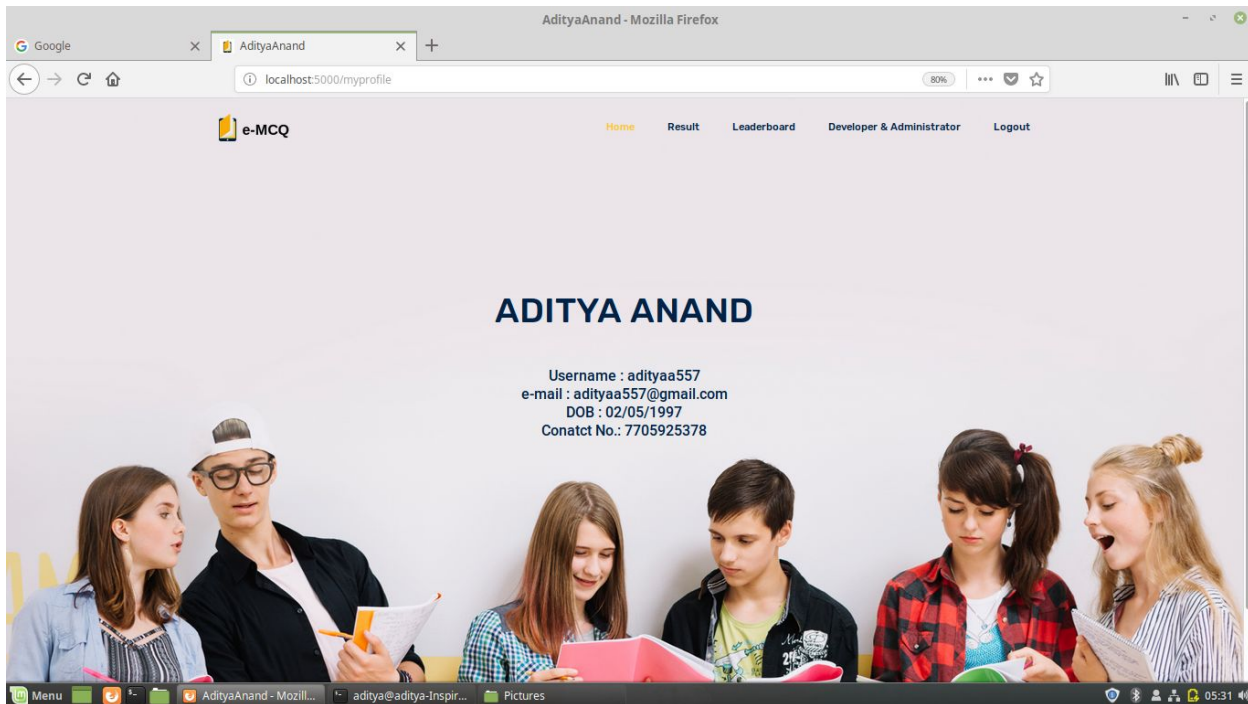
2. Candidate Registration
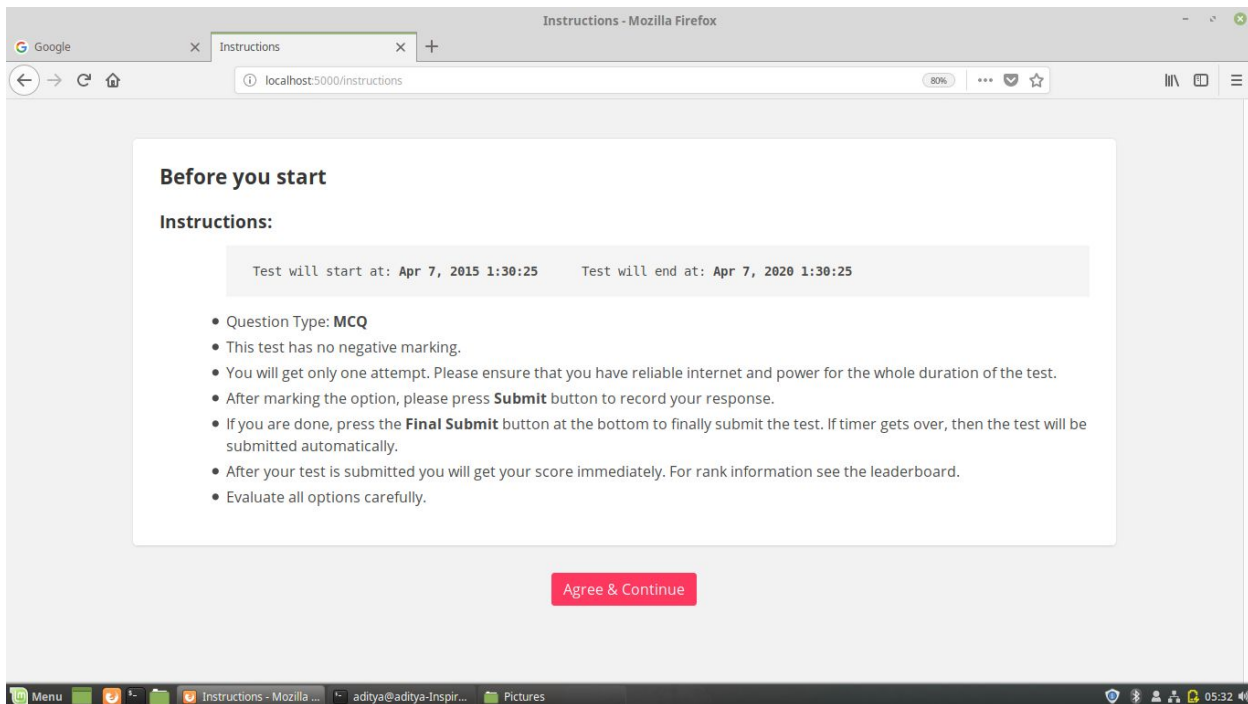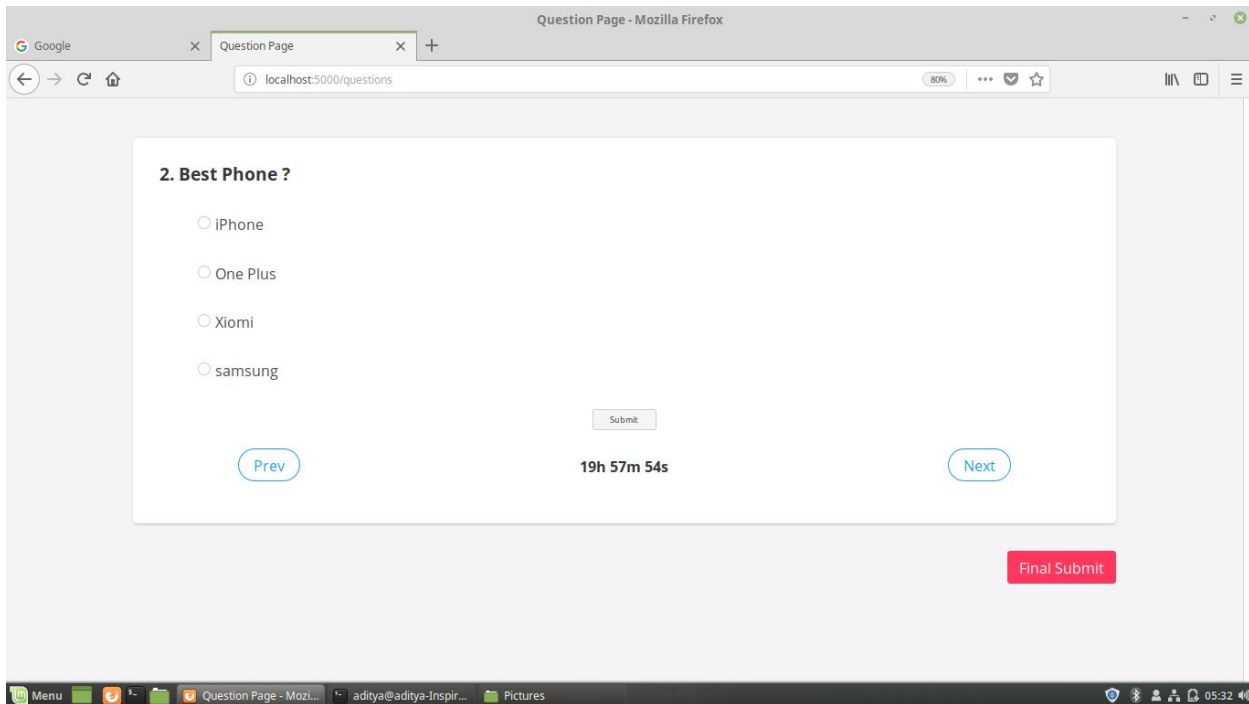
3. Candidate Login

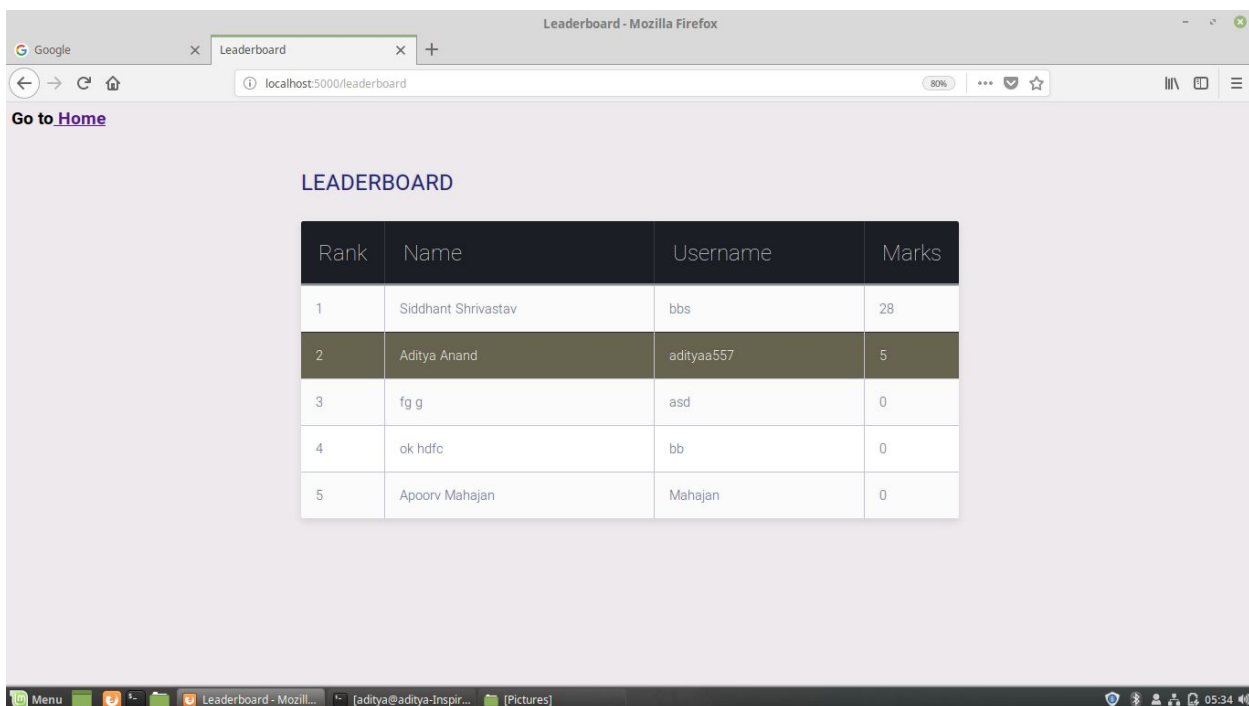## 4. Setter Login
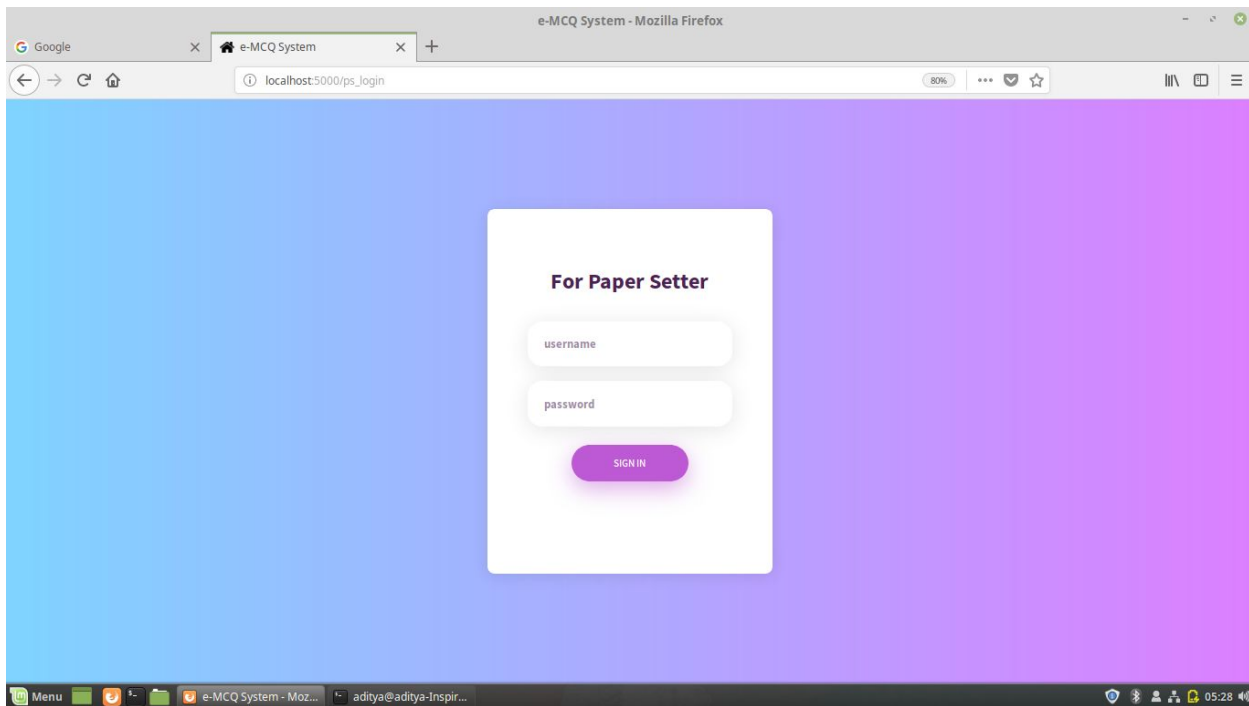
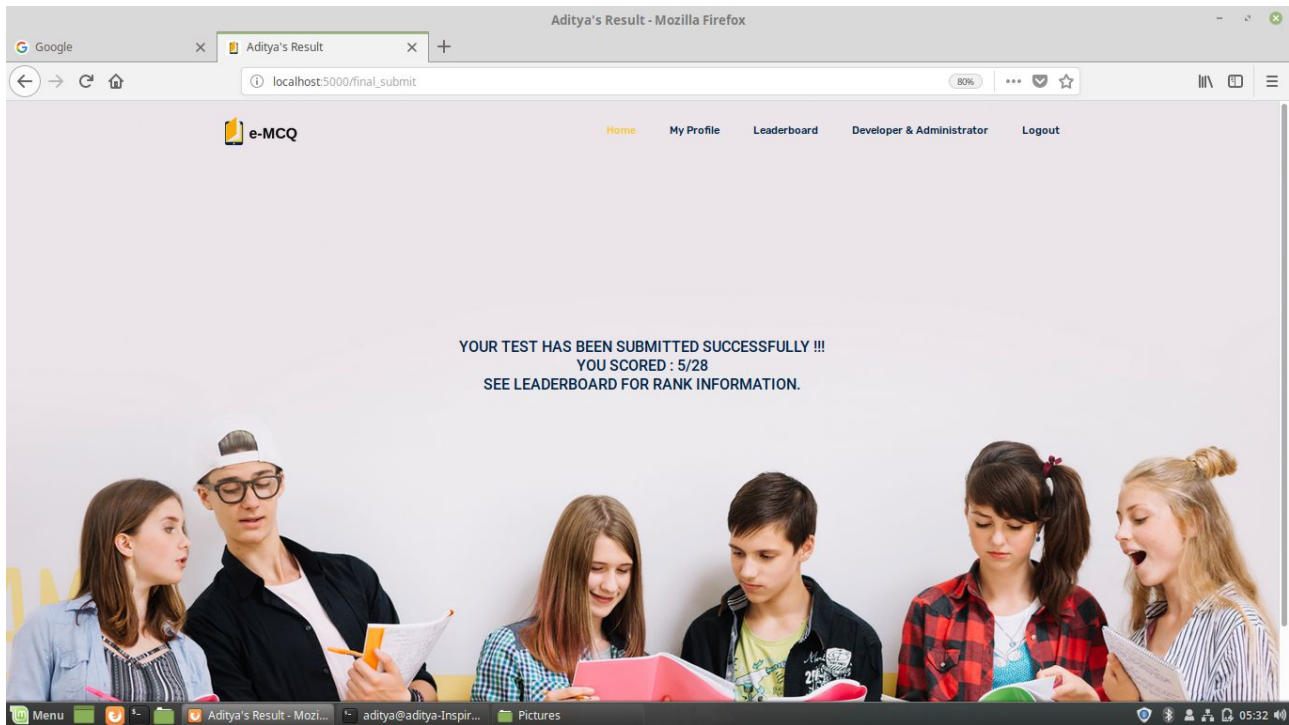## 5. User Profile

6. Test Instructions
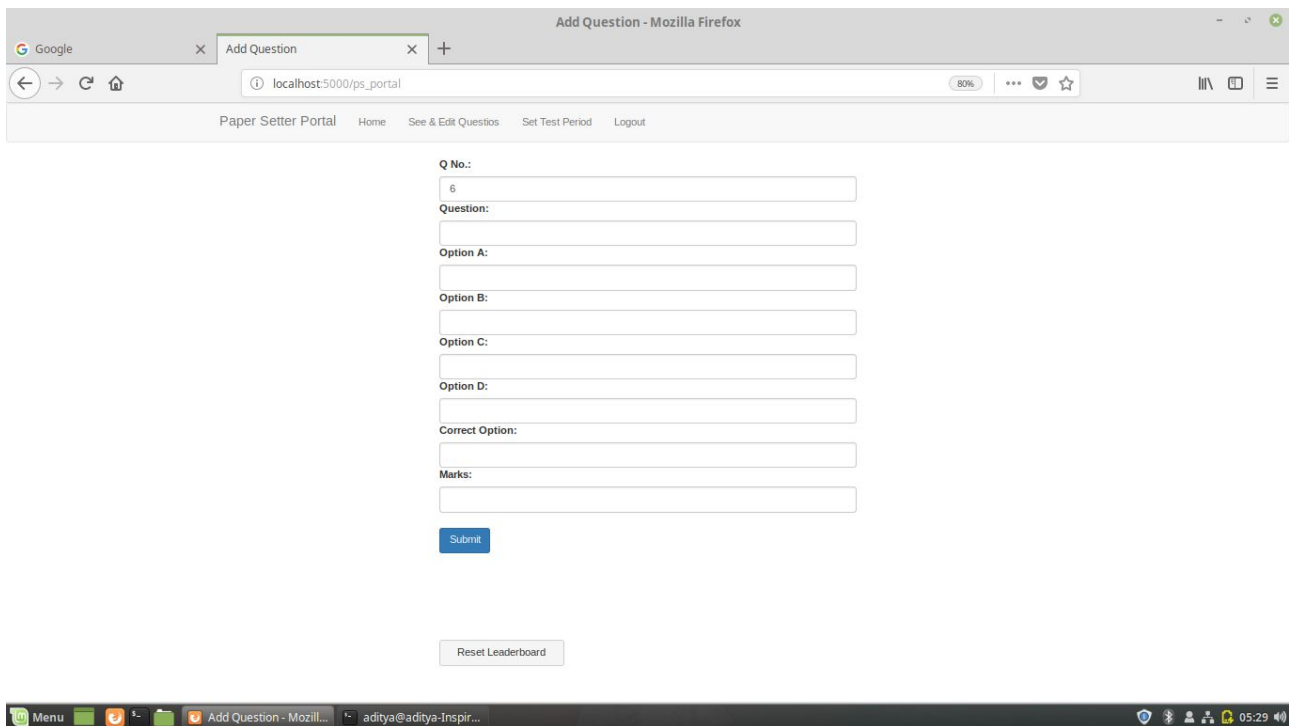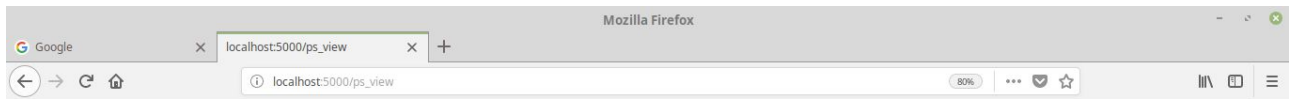
7. Questions

8. Leaderboard

9. Candidate Result

10. Paper Setter portal after login for setting questions

11. Edit Questions

Go to Paper Setter Home

Edit/Change Questions

Q no.	Question	Option A	Option B	Option C	Option D	Correct Option	Marks	Edit
1	None	None	None	None	None	None	0	Edit Delete
2	Best Phone ?	iPhone	One Plus	Xiomi	samsung	A	4	Edit Delete
3	Best superhero character ?	Deadpool	batman	Spiderman	Thor	D	5	Edit Delete
4	Best TV Series ?	Punisher	Westworld	Luke Cage	The Walking Dead	C	19	Edit Delete
5	None	None	None	None	None	None	0	Edit Delete

12. Set test period

Paper Setter Portal   Home   See & Edit Questios   Set Test Period   Logout

Test Starts at:

Apr 7, 2015 1:30:25

Test Ends at:

Apr 7, 2020 1:30:25

Submit

localhost:5000/test_timings
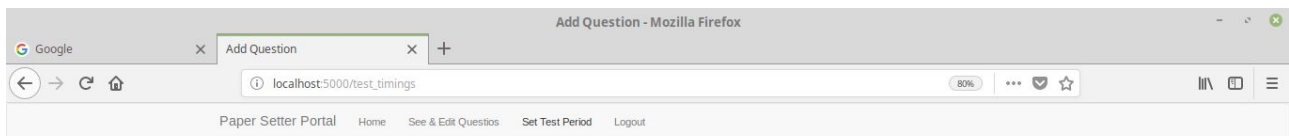
14. If anyone tries to access the test before time
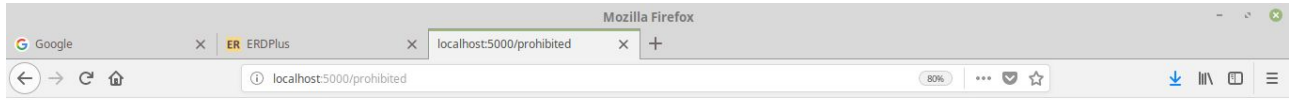
Test will start at Apr 7, 2021 1:30:25

Hang Onnn