DESIGN AND DEVELOPMENT OF LEARNING MANAGEMENT SYSTEM

A

MAJOR PROJECT-I REPORT

Submitted in partial fulfillment of the requirements

for the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE & ENGINEERING

By

Group No. 25

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Dec-2020

Department of COMPUTER SCIENCE & ENGINEERING
Sagar Institute of Science & Technology (SISTec)
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Approved by AICTE, New Delhi & Govt. of M.P.

Affiliated to Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal (M.P.)

Sagar Institute of Science & Technology (SISTec), Bhopal
Department of COMPUTER SCIENCE & ENGINEERING
Bhopal (M.P.)

Dec-2020

CERTIFICATE

We hereby certify that the work which is being presented in the B.Tech. Major Project-I Report entitled **Design and Development of Leaning Management System,** in partial fulfillment of the requirements for the award of the degree of ***Bachelor of Technology*** in ***Computer Science & Engineering*** and submitted to the Department of Computer Science & Engineering, *Sagar Institute of Science & Technology (SISTec)***,** Bhopal (M.P.) is an authentic record of our own work carried out during the period from Jul-2020 to Dec-2020 under the supervision of **Dr. Vasima Khan (Associate Professor).**

The content presented in this project has not been submitted by us for the award of any other degree elsewhere.

Name	**Enrollment Number**	**Signature**
Akhil Kumar Tiwari	**0187CS171020**	
Priyanshu Dubey	**0187CS171108**	

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date:

Project Guide ***HOD*** ***Principal***

ABSTRACT

The main purpose of this project is to provide a platform which can help faculties to deliver materials to students and other assignments, Track student progress, and manage record-keeping, handles online course administration, and tracking, and assessment of students work. It is also very useful in identifying progress towards learning and trainings. Supports Online Learning from anywhere and anytime. It helps in sharing up the student skills.

It is basically a web based learning management platform which can be used to evaluate the student's learning. This platform is developed in modular approach. It has different modules for different works and different accessibility levels. It is focused on online learning delivery and support a range of uses.

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ACKNOWLEDGEMENT

No volume of words is enough to express my gratitude towards my guide **Dr. Vasima Khan** and our project coordinator **Prof. Gajendra Gayakwad**, Department of Computer Science and Engineering, who has been very concerned and has added all the material essential for the preparation of this project report. We wish to express my sincere gratitude to **Dr. Keshvendra Choudhary**, Principal **Dr. Swati Saxena**, Vice-principal and **Prof. Ujjwal Nigam**, Head of Department for providing us an opportunity to do our project work on **"Design and Development of Learning Management System".** This project bears the imprint of many people.

We would also like to thank the staff members and my colleagues who were always there for the need of the hour and provided with all the help and facilities, which we required, for the completion of the project work.

Name	Enrollment Number	Signature
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LIST OF ABBREVIATIONS

ACRONYM	FULL FORM
SDLC	Software Development Life Cycle
SQL	Structured Query Language
HTML	Hyper Text Markup Language
UML	Unified Modeling Language
LMS	Learning management system
ER	Entity relations
MCQ	Multiple choice questions

Chapter 1
Introduction

CHAPTER-1
INTRODUNCTION

1.1 INTRODUCTION

During this pandemic situation in year 2020, where everything goes online it's not very easy for the faculties to track the student's performance. And there are very limited resources where faculties can take the test of their student's. This Leaning management system has been developed to override the problems prevailing in the practicing manual system of taking tests.

Every organization weather it's big or small, has challenges to overcome and manage the information of the students Assignment's, Quiz, Announcements, Programming Arena, Combined tests (includes both Quiz and Programming).

1.2 FUNCTIONALITIES

The functionalities provided by our learning management systems are:

- Student Management System
- Teachers/Faculties Management System
- Admin with Bird Eye
- Quiz App
- Programming Arena

1.2.1 STUDENT MANAGEMNET SYSTEM

Student module is added with very limited access reach. They can only work on the contents that are provided to them by admin or by teachers. Students have all the access to the programming arena, they can visit to programming arena and code there. But for the quiz app, they cannot go and start any quiz, they will be restricted with the only that are allocated to them.

Some of the important features for the student module:

- Create account (No Approval Required By Admin, Can Login After Signup)
- After Login, can see how many courses/exam & questions are there in system on dashboard.
- Can give exam any time, there is no limit on number of attempt.
- Can view marks of each attempt of each exam.
- Question pattern is MCQ with 4 options and 1 correct answer.

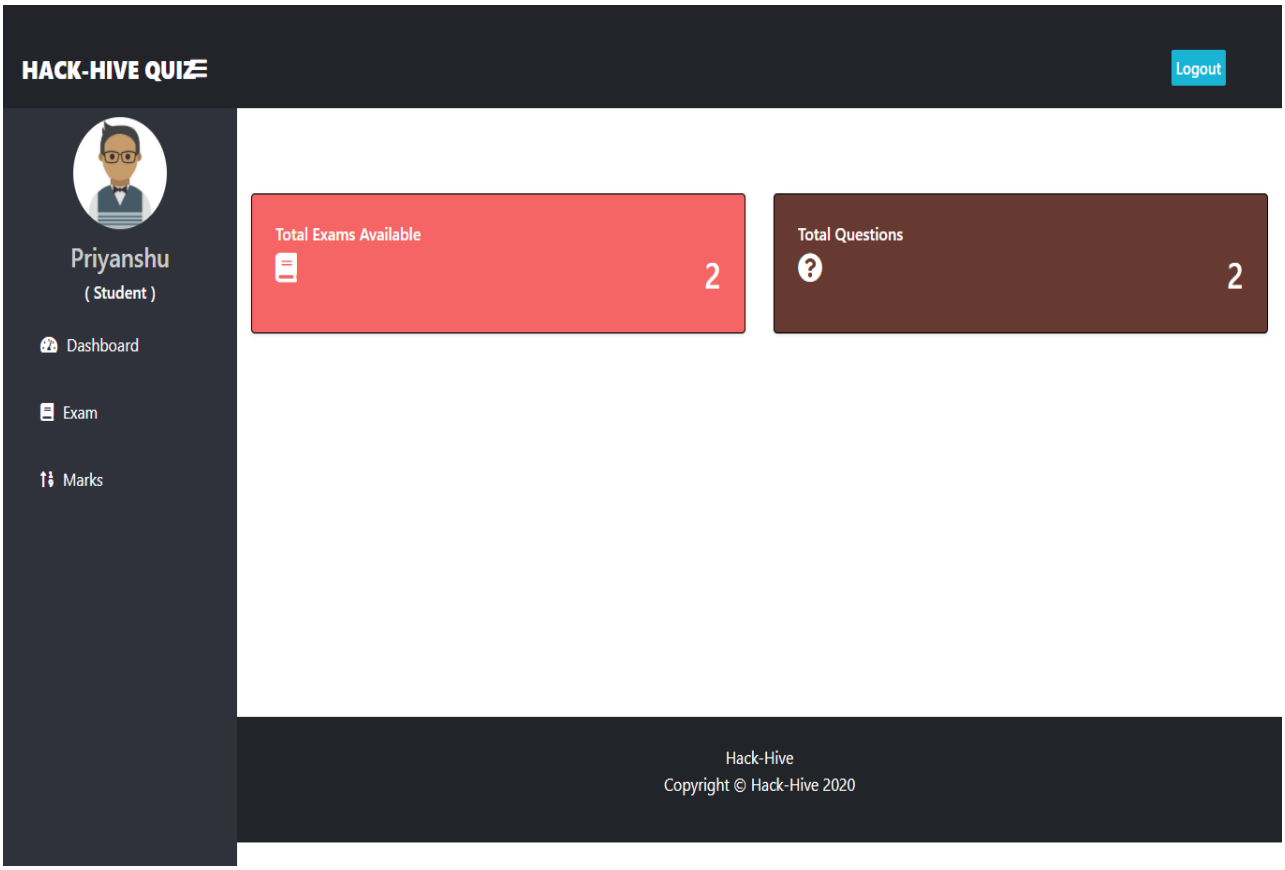

Figure 1.1 Student dashboard

1.2.2 TEACHERS/FACULTIES MANAGEMENT SYSTEM

Teachers have some extra features from students, but they also don't have all the accessibility. Teachers have some extra features and those are they can add quiz for students, and they can change/update questions in any quiz.

Some of the important features of Faculties module are:

- ❖ First they have to register themselves. Then Login (Approval required by system admin, then only teacher can login).
- ❖ After Login, can see total number of Student, Course, and Questions are there in system on dashboard.
- ❖ Can add, view, and delete course/exams.
- ❖ Can add questions to respective courses with options, correct answer, and marks.
- ❖ Can view and delete questions too.

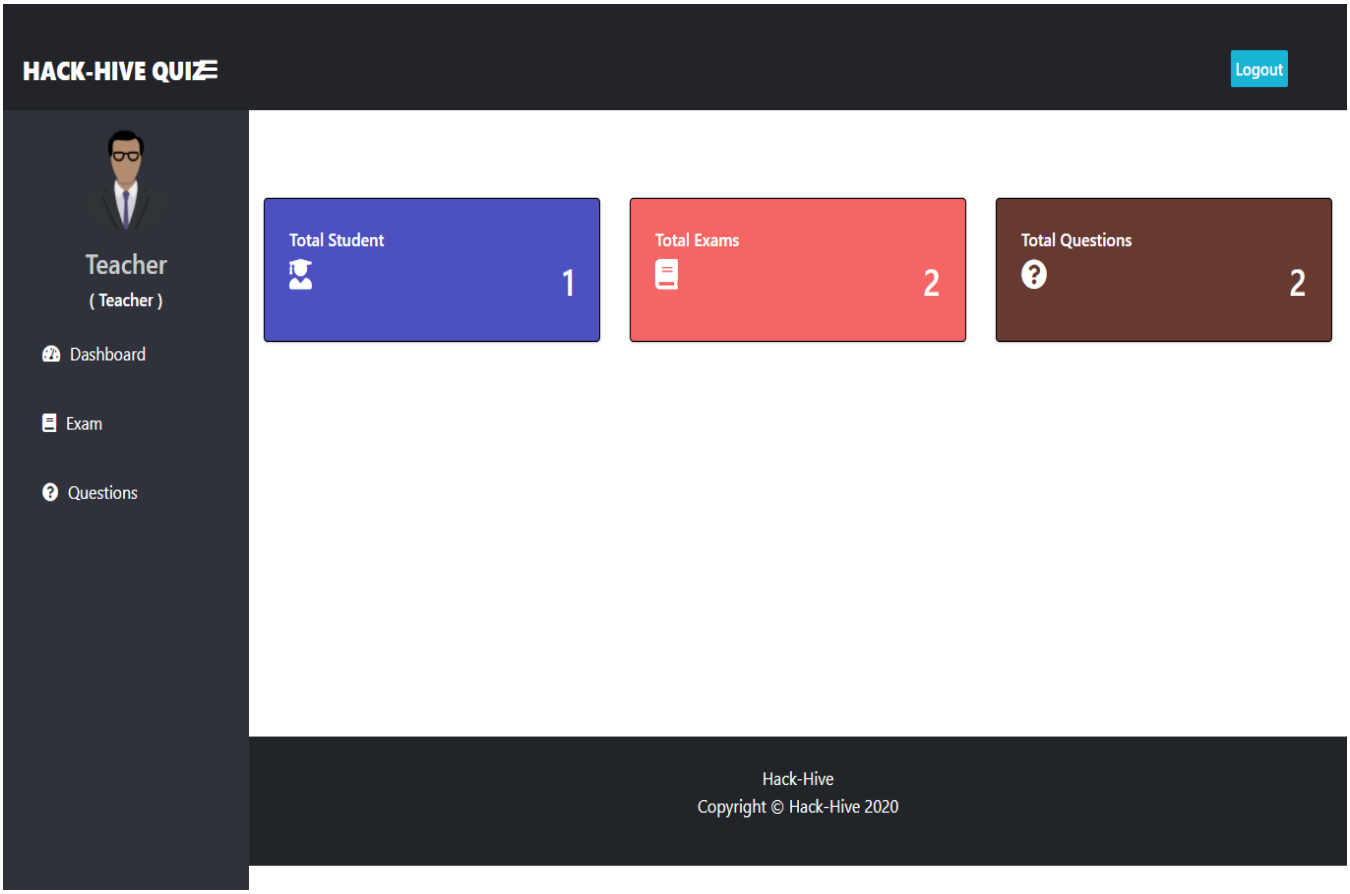

Figure 1.2 Teacher's dashboard

1.2.3 ADMIN PANNEL

In this project, we have given the bird eye to the Administrator, they can manage both teacher and students, and also Quiz/Exams.

Some of the important features of Admin panel are:

- Create Admin account using command

  py manage.py createsuperuser

- After login, can see total number of student, teacher, course, and questions are there in system on dashboard.
- Can view, update, delete, and approve teacher.
- Can view, update, and delete student.
- Can also see student marks.
- Can add, view, and delete course/exams.
- Can add questions to respective courses with options, correct answer, and marks.
- Can view and delete questions too.

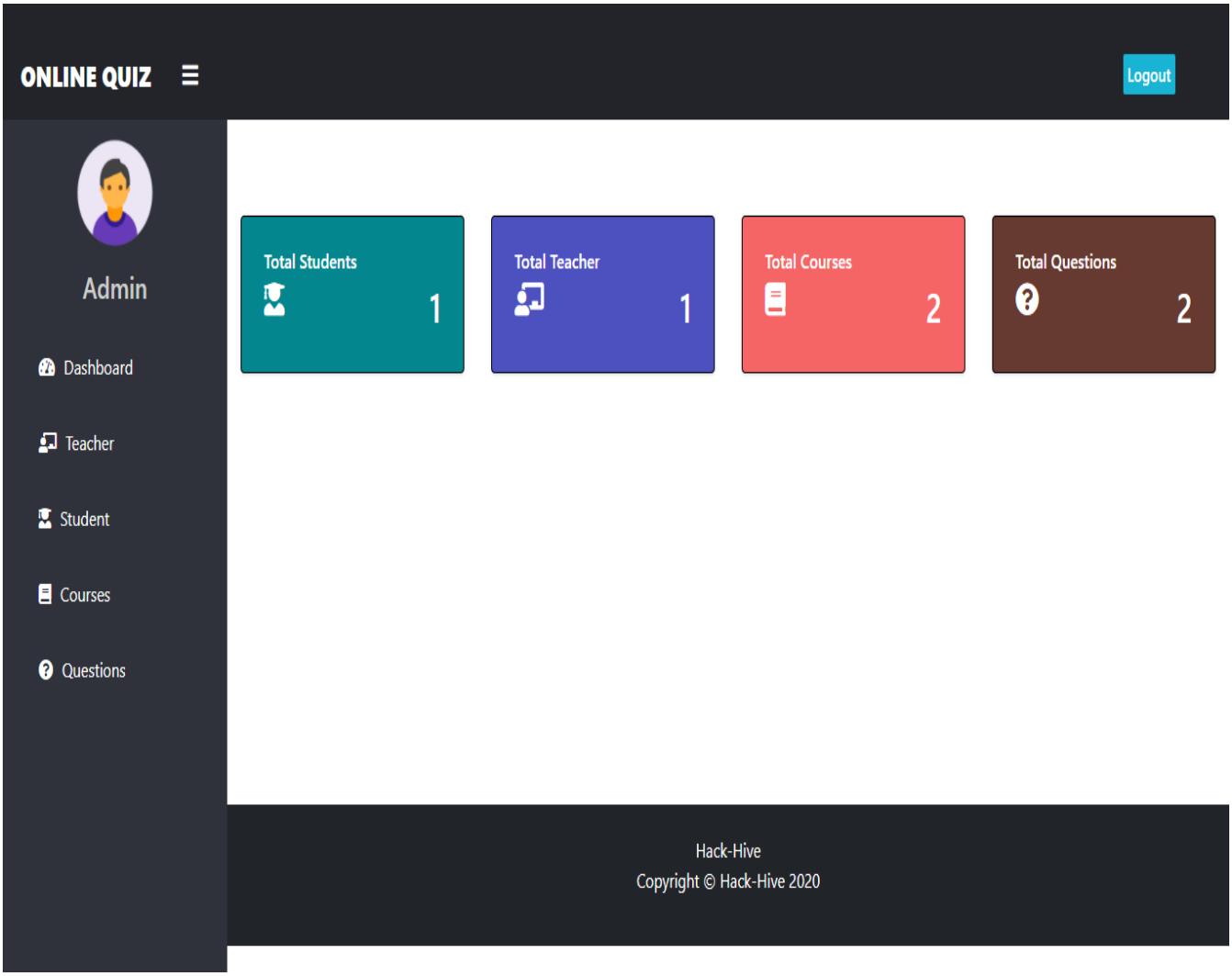

Figure 1.3 Admin dashboard

1.2.4 QUIZ APP

The Quiz app is a platform integrated in learning management system where faculties can conduct the quiz for their students and also for the selected students.

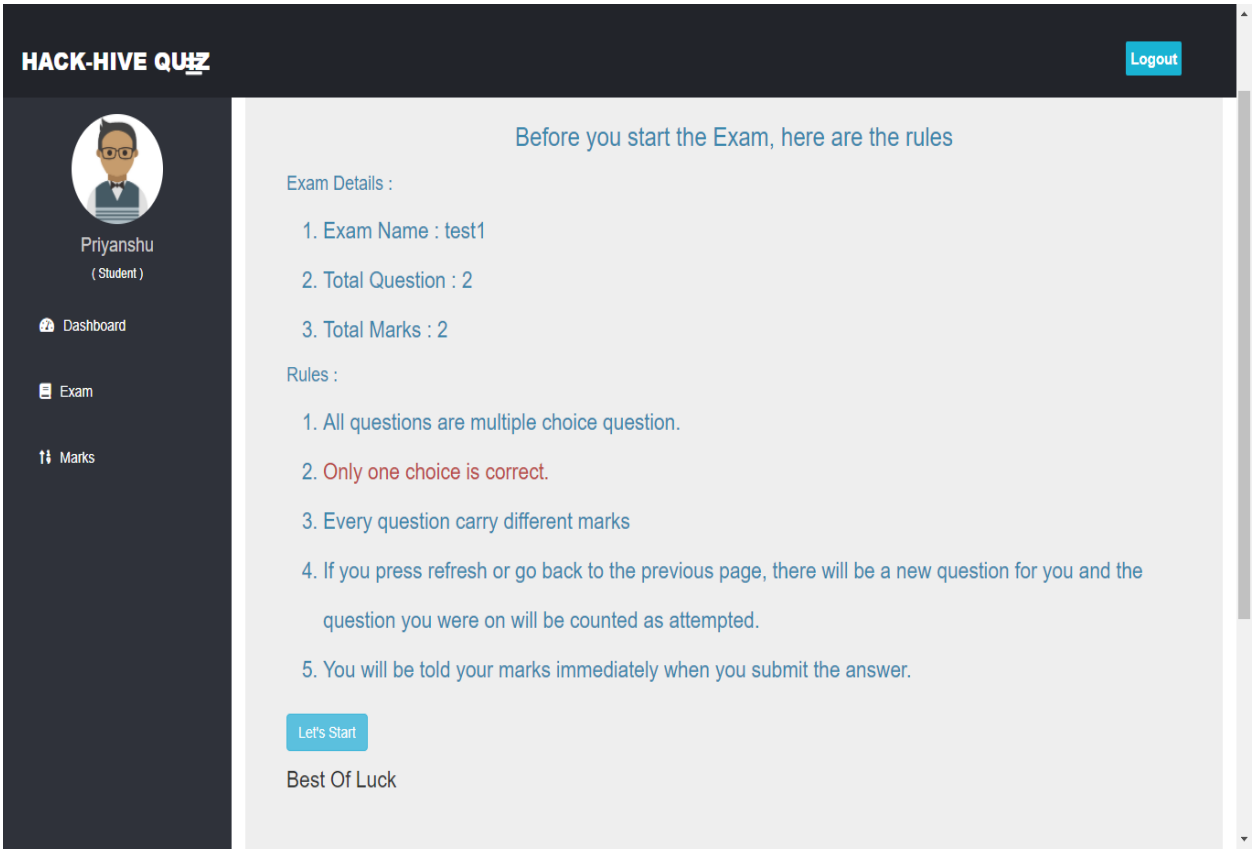

Figure 1.4 Quiz instructions

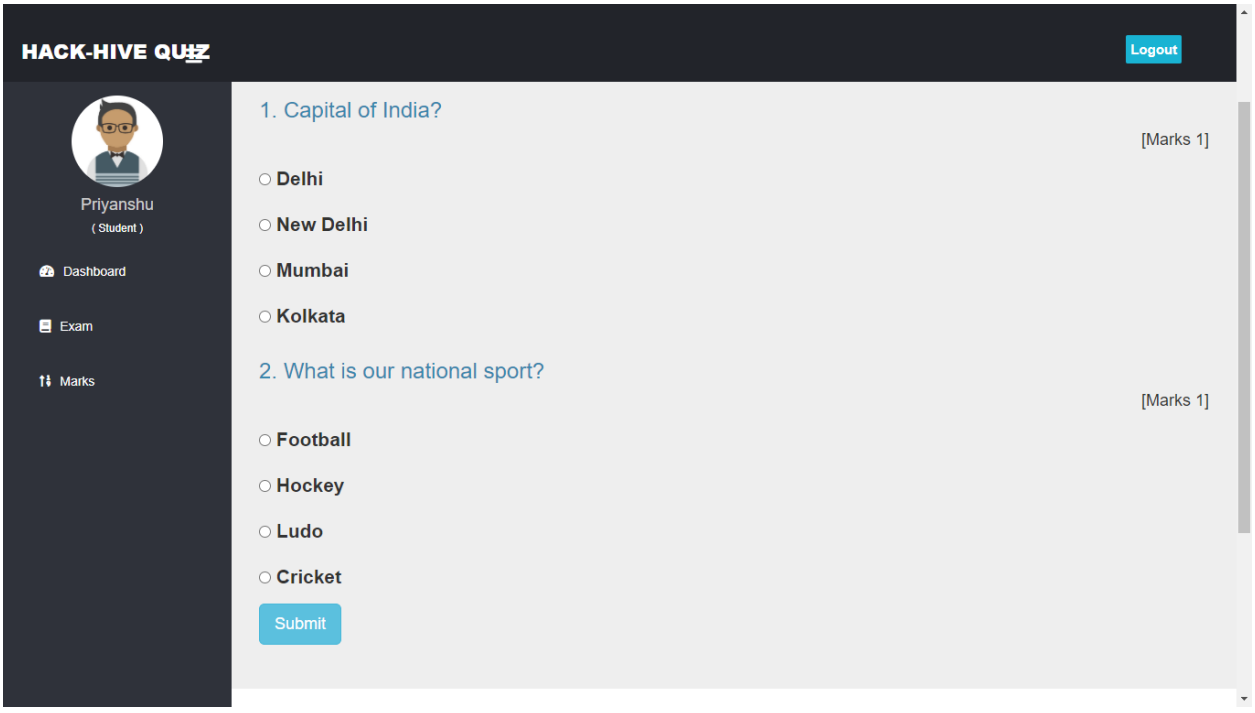

Figure 1.5 Quiz

1.2.5 PROGRAMMING ARENA

Programming Arena Module is being built for programming practices and conduct programming challenges.

Some important features of programming arena are:

- Programs can be written in a special editor embedded on the console itself.
- The editor has theme and brackets corrector, and colouring theme based on word entered into it.
- The standard compilers are used and modular approach will help in extending the same.
- Currently support three languages c, c++ and python.

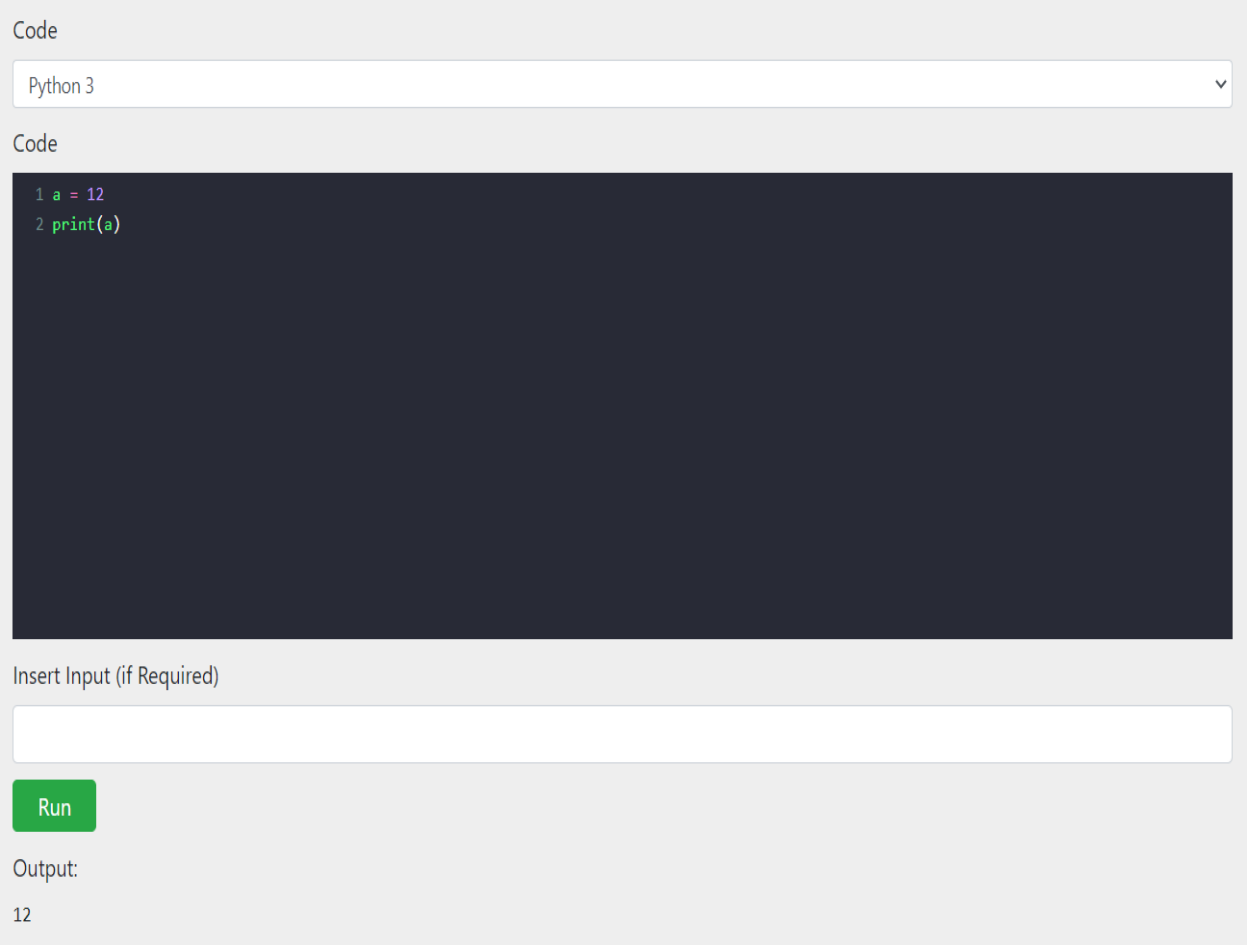

Figure 1.6 Programming arena

1.3 OBJECTIVE

The main objective behind this project is to provide a user friendly platform which can be used to share knowledge and also test the knowledge, and give everyone a chance to learn, irrespective of where they are stucked in this pandemic situation.

The main features that the system provides can be made use of, once the student get themselves registered to this platform than the faculties can monitor their learning by the help of this platform. Faculties can also takes the test of the student as per their needs.

And at the very same time, students can also visit to programming arena and there they can practice for the programming, and faculties can also take programming tests of their students.

Chapter 2
Software and Hardware Requirements

CHAPTER-2
SOFTWARE AND HARDWARE REQUIREMENTS

2.1 INTRODUCTION

To be used efficiently, all computer needs certain hardware component or other software resources to be present on a computer these perquisites are known as system requirements. Most software defines two sets of system requirements: minimum and recommended with increasing demand for higher processing power and resources in new version of software of system requirements to increase our time.

2.2 SOFTWARE REQUIREMENTS

Software is part of computer system that consist of data and computer instructions, in contrast to the physical hardware from which the system is built. In computer science and software engineering, computer software is all information processed by computer system, Program and data. Computer software include computer program library dependencies and related non-executable data such as online documentation or digital media in this project. We have used following software:

Table 2.1 Shows that the used tools and software

Tool	DJANGO
Frontend	Html, CSS, JavaScript
Backend	Python3, PHP
Database	Sqlite3
Text Editor	Microsoft Visual Studio

Chapter 3
Problem Description

CHAPTER-3
PROBLEM DESCRIPTION

3.1 ABOUT

Problem description define the issues in working domain that are required to solve using automation.

3.2 PROBLEM

In this pandemic situation, everything goes online whether its education or work. So, to manage the students and their progress we definitely need something where we can rely on also a platform where they can test the learning growth of their students.

Because a learning management system can help users with the following features:

- **ORGANIZES LEARNING CONTENT AT ONE LOCATION**

  Instead of having the learning content spread out over different hard drives and devices, student can store all of learning materials in one location. This reduces the risk of losing important data and makes it easier to create users course.

- **TRACK THE PROGRESS OF LEARNER**

  It gives the ability to keep track of learner progress and ensure that they are meeting their performance milestones. For instance, if an online learner is not able to successfully complete an eLearning scenario, user can offer them supplemental resources to improve their performance or learning behaviors.

- **QUICKLY AND CONVENIENTLY EXPANDS COURSES**

  If teacher want to add additional online modules to eLearning course in order to update information based on new trends or scientific evidence, teacher can simply login to the Learning Management System and make the necessary modifications without redoing the entire eLearning course.

Chapter 4
Literature Survey

CHAPTER-4
LITERATURE SURVEY

4.1 ABOUT

This chapter describes the users carried out to understand the domain. It is basically overall analysis before proposing our system

4.2 EXISTING SYSTEM

There are a lot of learning management systems already available in the market such as Moodle the one that we are already using in our college. But it's not secure and neither has it had all the latest features that are supposed to be according to today's era and today's situation.

4.3 DISADVANTAGES OF EXISTING SYSTEMS

- Previous system has slow execution, they are developed with old technologies, where as our system is completely developed with new technology like Django. It is very user friendly framework of python.
- User management system is not very efficient, where as our platform is completely model based. We have a separate model for users whether its Student, Teacher, or Admin our platform keeps their record separately and manages separately.
- Security is very big concern now a days, because we all know that data is the biggest asset available in today's era so security is the very first concern for everyone. And if we look at the security in our previous apps then we will get to know that they are not really secure and neither does they provide secure test environment. But we are providing a complete secure test environment where user cannot switch the tab or the window.
- Previous systems has very inefficient programming area with not so good editor and old version compilers. But here we are providing with a very good text editor which has multiple themes and also with the latest versions of compilers.
- Announcement system in previous existing system is not so good but in our platform teacher/ admin can make an announcement for students/teachers and it will be notified immediately to them to their respective contact information.

4.4 PROPOSED SYSTEM

"Design and Development of **Learning Management System**", solves the problem of previous systems and this will also provide the users with some new features which is not available in previous existing systems.

4.5 CHARCTERISTICS OF PROPOSED SYSTEM

- Different modules for all modules (Students, Teachers, Admin, Quiz, and Programming)
- By considering the security we are providing the Bird Eye View to the Admin.
- Students cannot make changes to their profile once created, they have to reach to Admin for that.
- Teacher cannot login directly after signup, they have to wait for the admin to verify their profile.
- No one can register for the admin, it will be generated by the help of commands and from the database.
- Both teacher and admin can setup the test and add the questions of the test.
- Teacher/ Admin can update the questions in the test anytime they want to.
- Quiz app is a separate module so there will not conflict with others.
- Separate Programming module where students can perform programming practices.

Chapter 5 Software Requirement Specification

CHAPTER-5
SOFTWARE REQUIREMENT SPECIFICATION

5.1 ABOUT

A software requirement specification (SRS) is an description of a software system to be developed, laying out functional and non-functional requirements and may include a set of use case that describe interaction the users will have with the software.

5.2 FUNCTIONAL REQUIREMENTS

A functional requirement defines a system or its component. It describes the functions a software must perform. A function is nothing but inputs, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform.

Here are few functional requirements:

- User must be registered to the portal, otherwise he/she will not be able to visit any single module.
- Programming arena requires a Linux server.
- The Linux server has to be configured and set up all the compilers on the server with some of the text editors.
- The compiler must be configured to execute the text editor's code and also have to identify the compiler to be executed with by the extension of the file.
- Server have to be configured which can receive the file from any single destination and can send the files to any single destination.
- The server also need a static IP, so that we can access the server and send and receive the files to the server.
- The quiz can only be setup by either Teacher or by Admin.
- The student can only be allowed to give the quiz.

5.3 NON-FUNCTIONAL REQUIREMENTS

A non-functional requirement is essential to ensure the usability and effectiveness of the entire software system. Failing to meet non-functional requirements can result in systems that fail to satisfy user needs.

Here are the non-functional requirements of this project:

- **Performance:** Website application will be light weighted and response time will be very less. Response to a particular action will be available in short period of time, throughput will be high, and its accessing speed will be very fast. It will provide a balance between the response time and throughput.
- **User Interface:** The UI of this project is following the design conventions.
- **Errors:** Input errors will be returned in red color with a message box.

Chapter 6
Software Design

CHAPTER-6
SOFTWARE DESIGN

6.1 ABOUT

Software design is a process to transform user requirements into some suitable form, which helps the programmer in software coding and implementation.

For assessing user requirements, an SRS (Software Requirement Specification) document is created whereas for coding and implementation, there is a need of more specific and detailed requirements in software terms. The output of this process can directly be used into implementation in programming languages.

Software design is the first step in SDLC (Software Design Life Cycle), which moves the concentration from problem domain to solution domain. It tries to specify how to fulfill the requirements mentioned in SRS.

6.2 USE CASE DIAGRAM

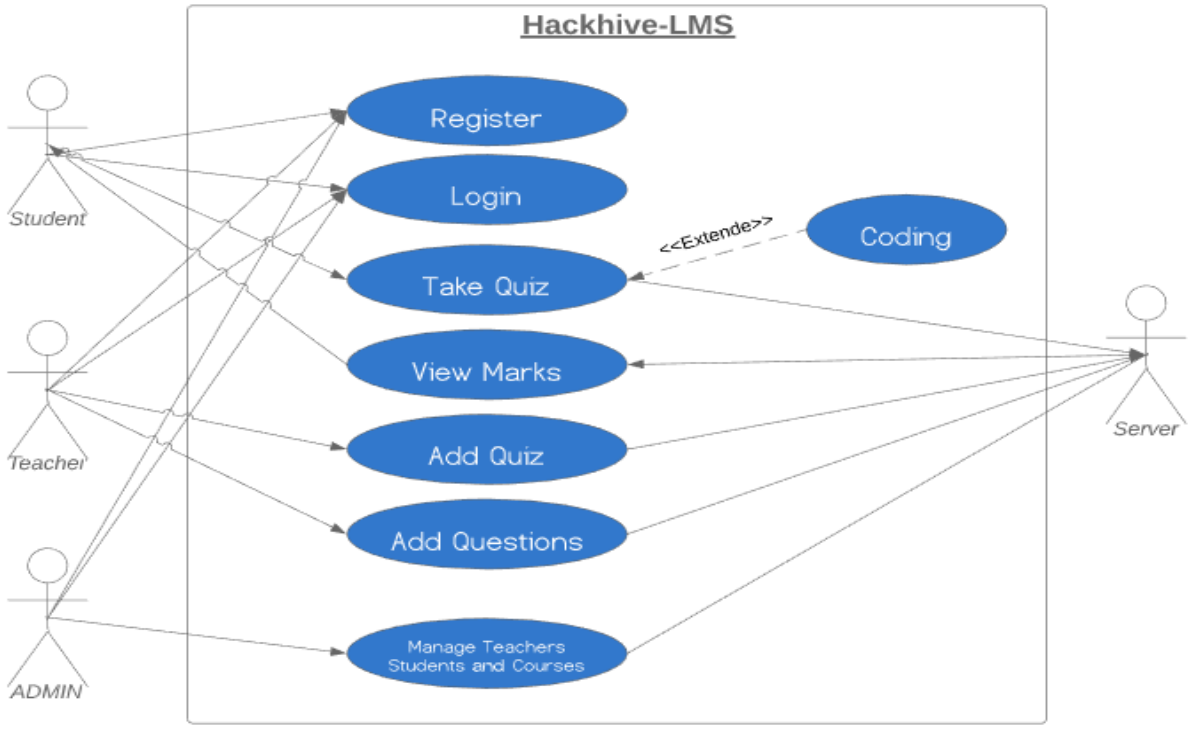

Figure 6.1 Use case daigram

6.3 ER DIAGRAM

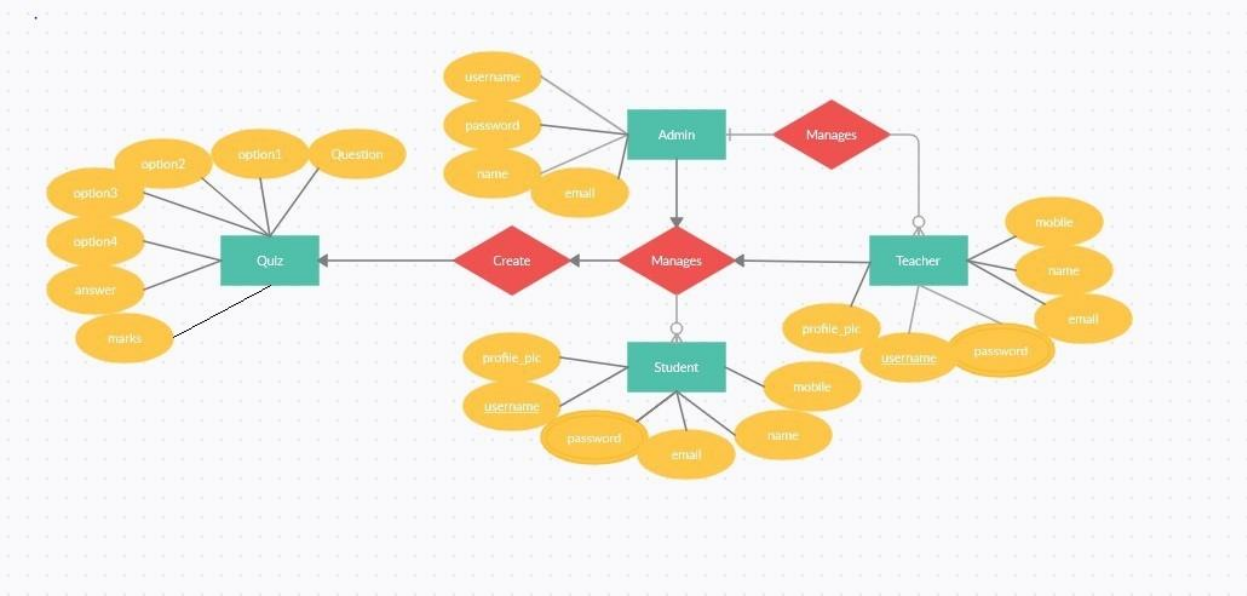

Figure 6.2 ER Didagram

6.4 TABLE STRUCTURE

The tables available in the database are as follows:

Table 6.1 student_student table structure

Field name	Constraints	Purpose
id	Primary key	For the serial number
profile_pic	NA	For profile
address	NA	For profile
mobile	NA	For verification
User_id	Unique	For identity

Table 6.2 teacher_teacher table structure

Field name	Constraints	Purpose
id	Primary key	For the serial number
profile_pic	NA	For profile
address	NA	For profile
mobile	NA	For verification
status	NA	For profile status
user_id	Unique	For identity

Table 6.3 quiz_result table structure

Field name	Constraints	Purpose
id	Primary key	For the serial number
marks	marks >= 0	Test marks
exam_id	NA	To identify the test
student_id	NA	To identify the student

Table 6.4 quiz_question table structure

Field name	Constraints	Purpose
id	Primary key	For the serial number
marks	marks >= 0	Test marks
question	NA	Question in quiz
option1	NA	Option of the quiz
option2	NA	Option of the quiz
option3	NA	Option of the quiz
option4	NA	Option of the quiz
answer	NA	The correct answer
course_id	NA	The course where this question belongs to

Table 6.5 quiz_course table structure

Field name	Constraints	Purpose
id	Primary key	For the serial number
course_name	NA	To identify the course
question_number	question_number > 0	To keep the count
total_marks	total_marks > 0	Total marks of test

Chapter 7
Output Screen

CHAPTER-7
OUTPUT SCREEN

7.1 ABOUT

This chapter will contain all the screenshots of output screens with one-line description.

7.2 SCREENSHOTS OF THE PROJECT

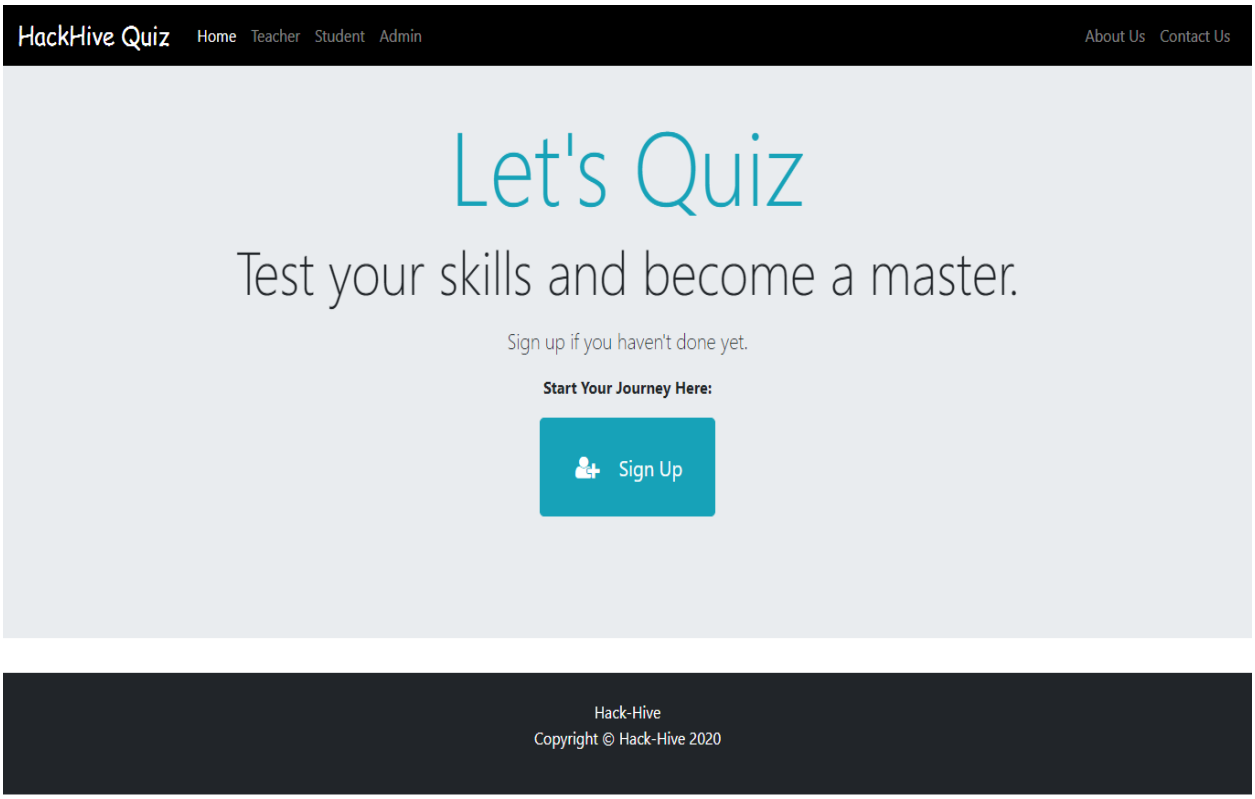

Figure 7.1 Home page of quiz app

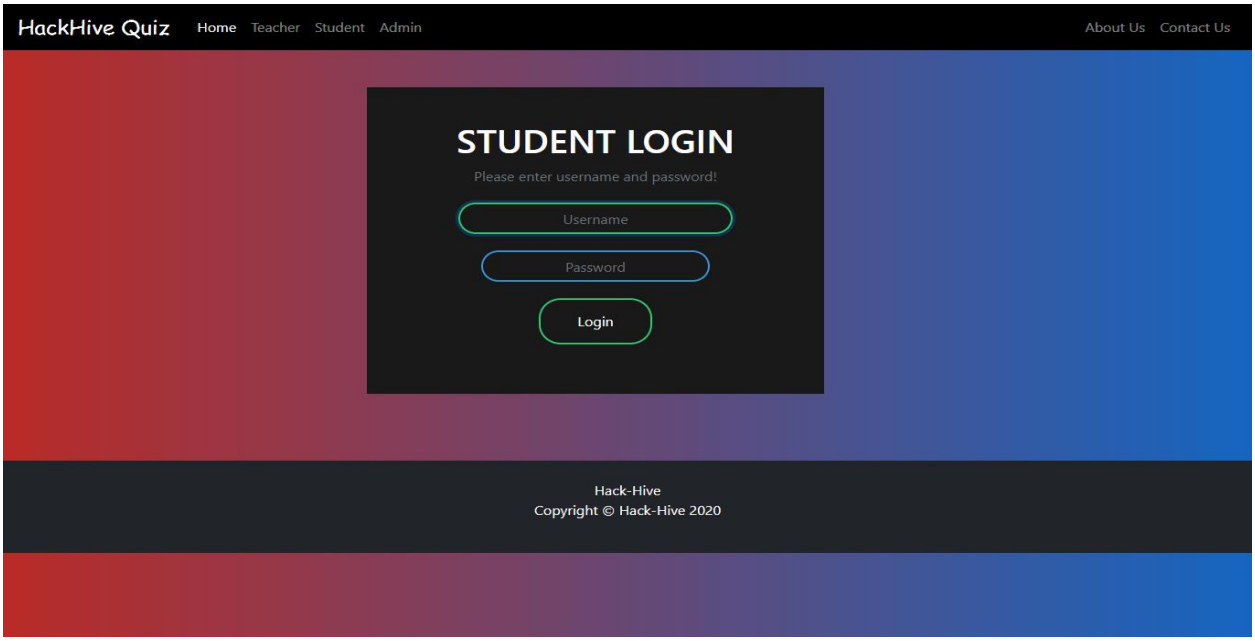

Figure 7.2 Student login page (Same UI of both teacher and Admin)

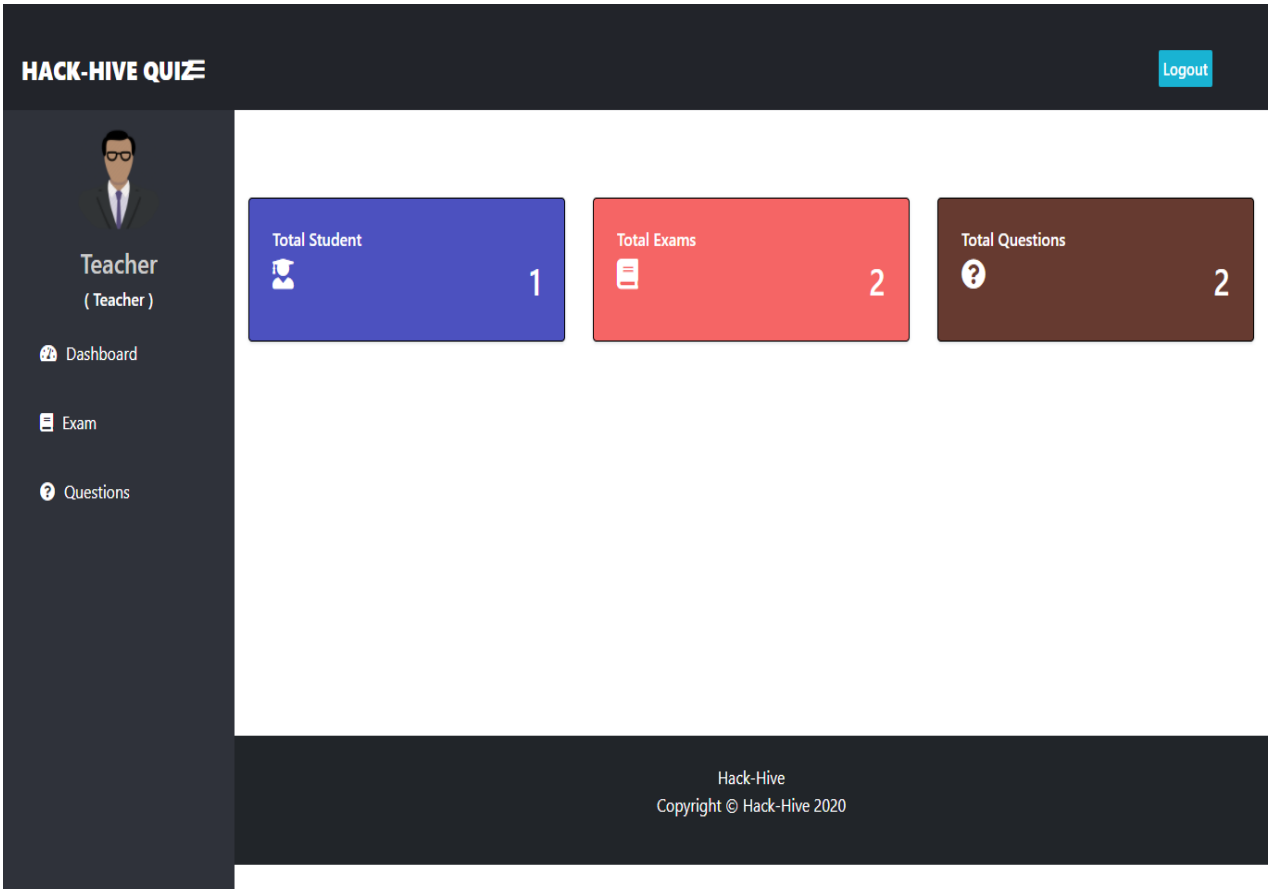

Figure 7.3 Teacher dashboard

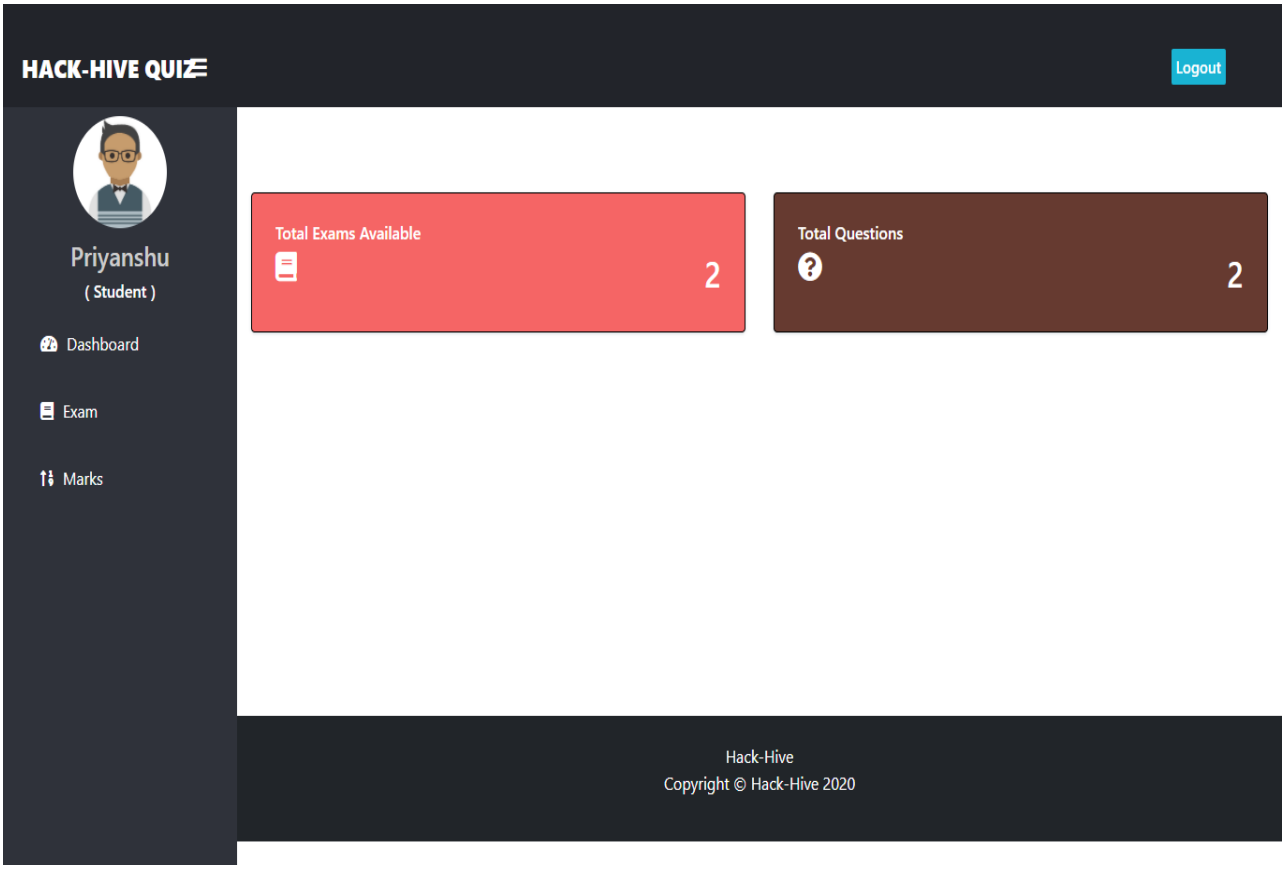

Figure 7.4 Student dashboard

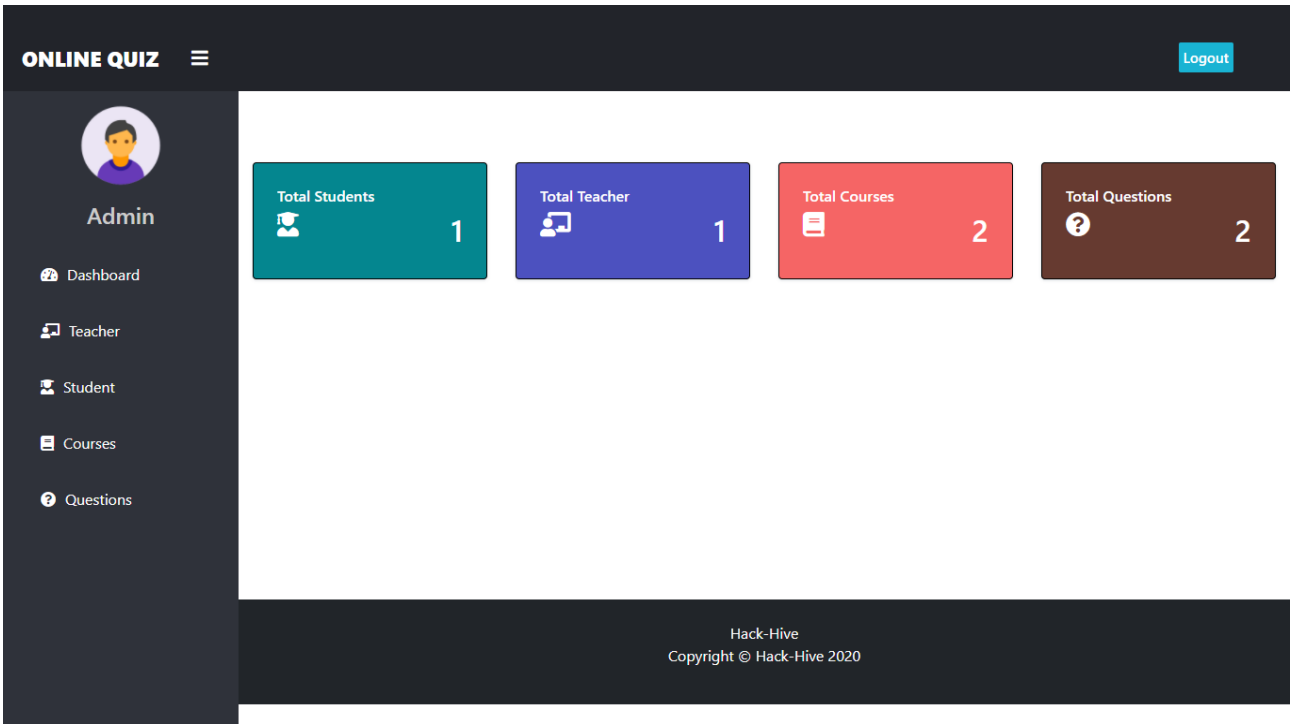

Figure 7.5 Admin dashboard

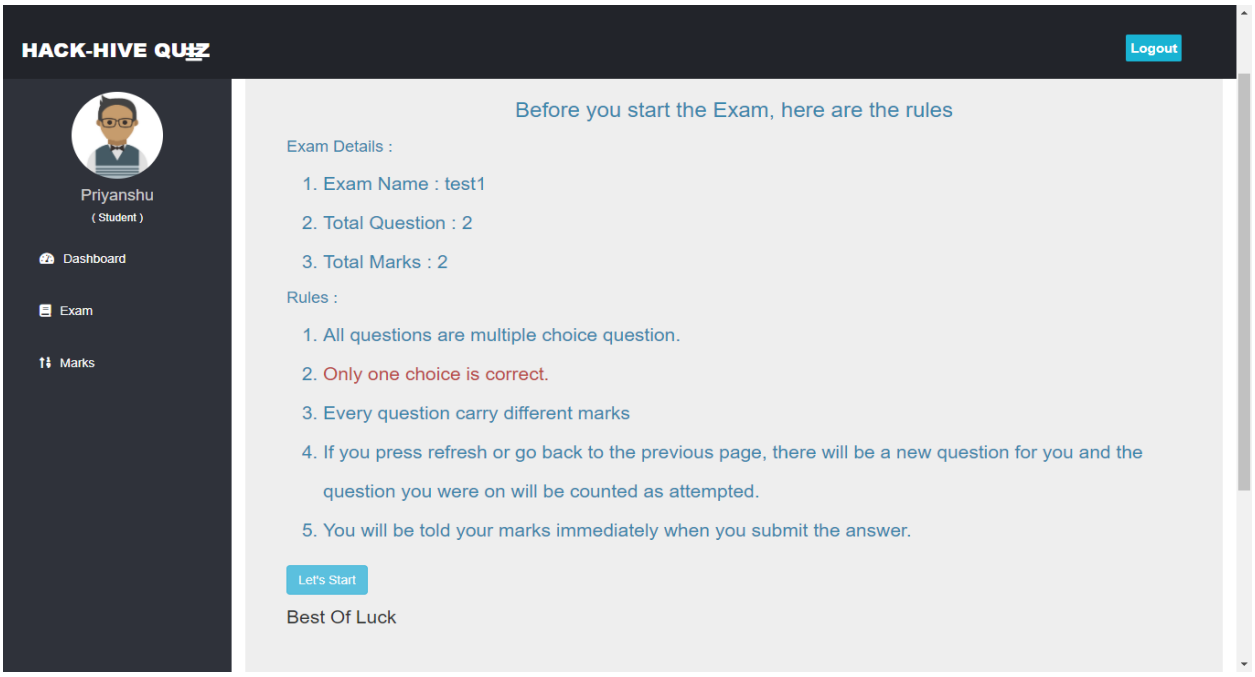

Figure 7.6 Quiz instructions

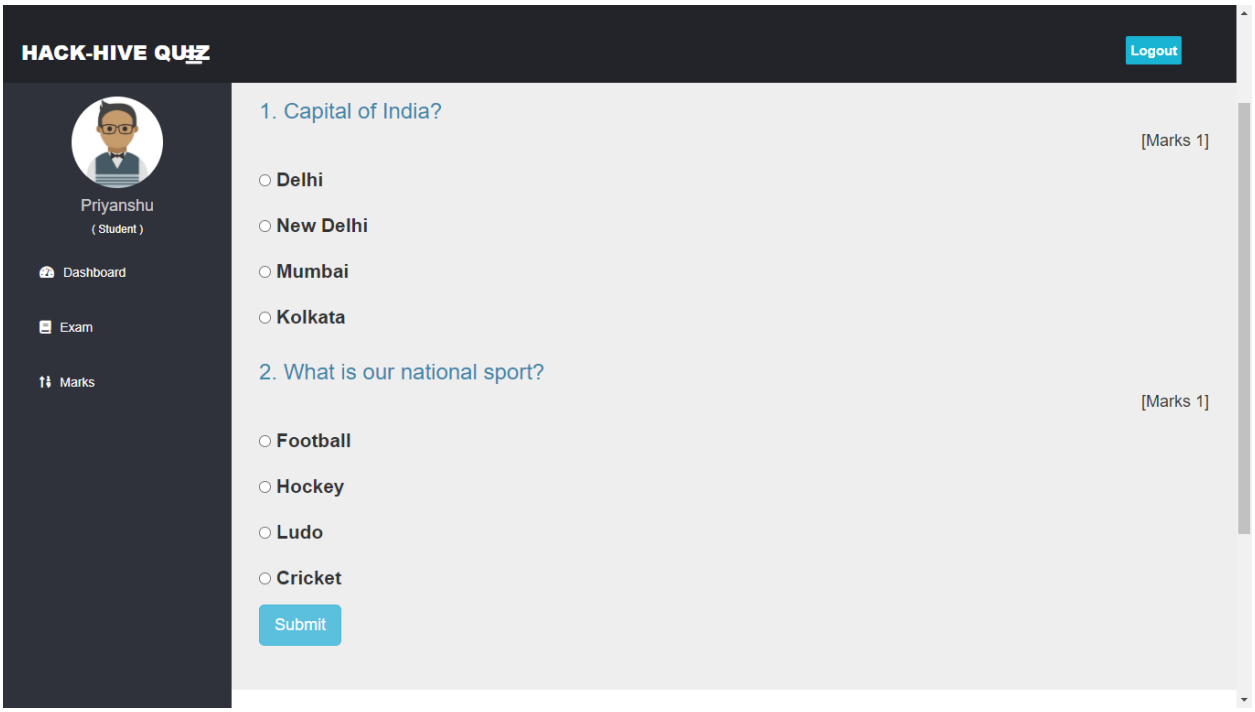

Figure 7.7 Quiz

REFERENCES

WEBSITES (with exact URL up to page)

1. https://docs.djangoproject.com/en/3.1/
2. https://sqlite.org/doclist.html
3. https://www.w3schools.com/js/default.asp
4. https://www.sqlitetutorial.net/sqlite-tutorial/sqlite-describe-table/

PROJECT SUMMARY

About Project

Title of the project	***HackHive-Learning Management System***
Semester	***VII Semester***
Members	***Akhil Kumar Tiwari, Priyanshu Dubey***
Team Leader	***Priyanshu Dubey***
Describe role of every member in the project	***Akhil Kumar Tiwari (Code Arena Module, Quiz(Front-End))*** ***Priyanshu Dubey (Quiz, Student, Teacher, and Admin Dashboard Module)*** ***Both of us acted as a Full Stack***
What is the motivation for selecting this project?	***On Going Pandemic gave us the motivation to develop an better online Learning Platform (LMS)***
Project Type (Desktop Application, Web Application, Mobile App, Web)	***Web Application***

Tools & Technologies

Programming language used	***Python, HTML, CSS, PHP, JavaScript***
Compiler used (with version)	***Django(3.1.4), SQLite(3)***
IDE used (with version)	***VS Code(1.52.1)***
Front End Technologies (with version, wherever Applicable)	***HTML5*** ***CSS3***
Back End Technologies (with version, wherever applicable)	***Python3*** ***PHP7***
Database used (with version)	***SQLite(3)***

Software Design & Coding

Is prototype of the software developed?	***Yes***
SDLC model followed (Waterfall, Agile, Spiral etc.)	***Agile***
Why above SDLC model is followed?	***The LMS is design on a Modular Approach***
Justify that the SDLC model mentioned above is followed in the project.	***The LMS is designed to be used in multiple Domains and can be set up for a CI Pipeline for development.***
Software Design approach followed (Functional or Object Oriented)	***Both Object Oriented and Functional***
Name the diagrams developed (according to the Design approach followed)	***UML, ER-diagram***
In case Object Oriented approach is followed, which of the OOPS principles are Covered in design?	***Abstraction, Inheritance***
No. of Tiers (example 3-tier)	***3-tier***
Total no. of front end pages	***33***
Total no. of tables in database	***15***
Database is in which Normal Form?	***BCNF***
Are the entries in database encrypted?	***Yes***
Front end validations applied (Yes / No)	***Yes***
Session management done (in case of web applications)	***Yes***
Is application browser compatible (in case of web applications)	***Yes***
Exception handling done (Yes / No)	***Yes***

Commenting done in code (Yes / No)	***Yes***
Naming convention followed (Yes / No)	***Yes***
What difficulties faced during deployment of project?	***Doing runtime Compilation for the codes submitted and submitting outputs and errors to the client.***
Total no. of Use-cases	***8***
Give titles of Use-cases	***Register, Login, Take Quiz, View Marks, Add Quiz, Add Questions, Coding, Manage Teachers, Students and Courses.***

Project Requirements

MVC architecture followed (Yes / No)	**No**
If yes, write the name of MVC architecture followed (MVC-1, MVC-2)	**NA**
Design Pattern used (Yes / No)	**No**
If yes, write the name of Design Pattern used	**NA**
Interface type (CLI / GUI)	**GUI**
No. of Actors	**4**
Name of Actors	**Admin, Teacher, Student, Server**
Total no. of Functional Requirements	**5**
List few important non-Functional Requirements	**UI will be work better when it will be online**

Testing

Which testing is performed? (Manual or Automation)	*Manual*
Is Beta testing done for this Project?	*No*

Write project narrative covering above mentioned points

In the Current Situation of pandemic, Learning has changed and so do the methods of doing it. So we have Introduce a learning platform with a modular approach and Modern UI Practices. This app is designed in way that it can be used in Any Particular Domain of Study like (Engineering, Medical, Management and etc.). The App has Modules Like QUIZ, Coding etc. The app is still under Alpha testing.

Akhil Kumar Tiwari (0187CS171020)
Priyanshu Dubey (0187CS171108)

Guide Signature

Dr. Vasima Khan

APPENDIX-1 GLOSSARY OF TERMS

(In alphabetical order)

A

APP Application :a program (such as a word processor or a spreadsheet) that performs a particular task or set of tasks

E

ER Entity Relationship Diagram. 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.

L

LMS Learning Management System. A **learning management system** (**LMS**) is a software application for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs.