



Project Report

On

LU Exam Hive

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A project paper submitted in partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Engineering.

CERTIFICATION OF REPORT

This is to certify that the work presented in this report is the outcome of the investigation carried out by the candidates under the supervision of Minhazul Haque Bhuiyan (Assistant Professor & Assistant Proctor of the Department of Computer Science & Engineering).

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Preface

Our first and foremost gratitude is to our GOD Almighty who has been with us all along and giving us the strength to complete the Final Year Project successfully.

We like to share our sincere gratitude to our project supervisor, Minhazul Haque Bhuiyan for his continuous support towards this project.

During the work we faced many challenges due to our lack of knowledge and experience. And our supervisor helped us to get over from all the difficulties and in final compilation of our idea to a shaped sculpture. His suggestions and guidance helped us a lot to prepare this report in a well-organized manner.

We are also thankful to our whole class and most of all to our parents who have inspired us to face all the challenges and win all the hurdles in life.

The report documents of this project work performed in the course CSE-4800 & CSE-4801 “Project II/Thesis” by Mohammed Saduzzaman Sadi, Toufique Ahmed, and Mohi Uddin Pabel. Project II/Thesis counts for 6 credit points and is executed by dividing it into two parts in two semesters. In the 11th semester CSE-4800 for Project Proposal which is 3 credit and in the 12th semester CSE-4801 for the Project Submission which is also 3 credit. Total 6 credits.

The project intends to give Leading University an Online Exam Platform for teachers to take exams and students can give exams remotely.

Supervision Agreement

The program outlined in the project is adequate for the degree of Bachelor of Science in Computer Science and Engineering. The supplies and facilities are available and we are willing to supervise and evaluate the project work.

Supervisor Signature

Minhazul Haque Bhuiyan

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Students Signature

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LU Exam Hive

Abstract

The purpose of the project “LU Exam Hive” is to create a web based online examination system. The website is supported in both Desktop and Smartphone platform.

Exam questions can be created by the teachers once they are logged into their account. Question type can be chosen and number of questions is dependent on the teacher’s preference. Questions are displayed in tabular format in the dashboard. Teacher can edit or delete a question. Questions will be available for students once the teacher posts it in a publicly viewed post page that is visible for both teacher and students.

Students have to register to the website first in order to gain log in access. After log in they can see all the available questions in the post page in a tabular format with all the required information about the question. From there they have to choose their course teachers question, which can be identified by the information given on the question.

Once student selects the question, it will redirect to the answer script where they will have to fill up a little form about themselves to verify that he/she is an actual student. Then they can write or choose the answer of the questions that are available and given by the teacher. Once they are finished, they can submit the answer script.

Teacher can specify a time as a deadline for submitting the answer script. They can decide to accept the answer script or not based on the time given and there will be the exact timestamp of when the student submitted the script.

The significance and purpose of this work is to provide a user friendly and reliable web based online examination system for the teachers and students of Leading University.

Table of Contents

Chapter 1: Introduction.....	1
1.1 The Project.....	2
1.2 Website	2
1.3 Web Project.....	3
1.4 Highlights of Web Project	3
1.5 Problem Definition.....	3
1.6 Project Contribution.....	3
Chapter 2: Background	4
2.1 Primary Focus	5
2.2 Prerequisites and Key Reasons	5
2.3 Execution Plan	6
2.4 Expected Outcome	7
Chapter 3: System Analysis.....	8
3.1 Existing System	9
3.2 Drawbacks of Existing System	9
3.3 Proposed System	9
3.4 Advantages of Proposed System.....	9
Chapter 4: Requirement Specification.....	10
4.1 Overall Description	11
4.2 External Interface Requirements.....	12
4.3 System Features	13
4.4 Website Attributes	20
Chapter 5: System & Database Design	21
5.1 System Design	22
5.2 Database Design.....	27
Chapter 6: Software & Other Tool Requirement.....	29
6.1 XAMPP.....	30
6.2 HTML5	30
6.3 CSS3	30
6.4 Bootstrap 4.6	30
6.5 JavaScript.....	30
6.6 jQuery	31

6.7 PHP	32
6.8 MySQL	33
6.9 Apache	34
6.10 Git & GitHub	35
6.11 PHPMailer.....	36
6.12 Summernote	36
6.13 FPDF.....	36
6.14 Visual Studio Code	37
6.15 Browsers and others.....	37
Chapter 7: Evaluation.....	38
7.1 Platform Evaluation	39
7.2 General Functional Evaluation	39
7.3 Non-Functional Evaluation.....	41
Chapter 8: GUI Design	42
8.1 UI Flowcharts.....	43
8.2 UI Design	44
Chapter 9: Implementation	78
9.1 Login-Logout Functionalities	79
9.2 Student Registration Functionalities	80
9.3 Teacher Dashboard	82
9.4 Student Dashboard.....	85
9.5 Admin Dashboard	87
Chapter 10: Testing.....	93
10.1 Platform Testing.....	94
10.2 Requirement Testing.....	94
Chapter 11: Conclusion	95
11.1 Conclusion	96
11.2 Further Work.....	96
References	97

Chapter – 1

Introduction

1.1 The Project

The Internet has revolutionized communications, to the extent that it is now our preferred medium of everyday communication. In almost everything we do; we use the Internet. And this happens through what is called the web or web application. It's also having a greater impact on the education systems too. Also, in recent times, the COVID-19 outbreak sent the world spinning into complete and utter chaos. Going outside was restricted and industries, offices, educational institutions were closed for a long time.

Especially educational institutions are closed till now. At that time educational institutions had to find an alternative way of taking exams and keep other educational activities running. For that, almost every institution had to teach and take exams remotely via various websites. Zoom, Classroom, and other web-based applications became more renowned. The impact is so big that every university is relying on those websites to continue academic activities.

The objective behind developing this website was to facilitate the exam system for Leading University's teachers and students so that they don't have to rely on other third-party web applications for taking exams. The website will allow teachers to take exams and students can attend and give exams remotely. The project is developed mainly with PHP programming language from scratch.

1.2 Website

A website (also written as web site) is a collection of web pages and related content that is identified by a common domain name and published on at least one web server. Notable examples are wikipedia.org, google.com, and amazon.com.

All publicly accessible websites collectively constitute the World Wide Web. There are also private websites that can only be accessed on a private network, such as a company's internal website for its employees.

Websites are typically dedicated to a particular topic or purpose, such as news, education, commerce, entertainment, or social networking. Hyperlinking between web pages guides the navigation of the site, which often starts with a home page.

Users can access websites on a range of devices, including desktops, laptops, tablets, and smartphones. The software application used on these devices is called a web browser.

The World Wide Web (WWW) was created in 1990 by the British CERN physicist Tim Berners-Lee. On 30 April 1993, CERN announced that the World Wide Web would be free to use for anyone. Before the introduction of the Hypertext Transfer Protocol (HTTP), other protocols such as File Transfer Protocol and the gopher protocol were used to retrieve individual files from a server. These protocols offer a simple directory structure which the user navigates and where they choose files to download. Documents were most often presented as plain text files without formatting or were encoded in word processor formats.

1.3 Web Project

A web project is the process of developing and creating a Web site, activities in a network which are aimed at a pre-defined goal. The network can be both accessible for everyone, as in the Internet, or only for certain people, as an intranet. The goal of Web projects is the transfer of static and dynamic content - both directly to end users, as well as indirectly through means of various kinds of interfaces. Web projects are based on TCP/IP (Transfer Control Protocol/Internet Protocol) technology and concern the transfer of static and dynamic content.

1.4 Highlights of Web Project

A Web project involves many aspects, including programming and the accompanying software development, Web business, Web server and network administration, hosting, graphics/design, the development and administration of databases, construction of interfaces, project management and quality assurance, and much more.

Programming for a web project may be accomplished using one or more markup languages (such as HTML, CSS, XML), scripting languages (JavaScript, Perl, PHP for example).

When hosting a Web project, the primary objectives include the provision of the necessary hardware and software infrastructure, and an assurance that the highest possible levels of availability and reliability are offered. Graphic/Web design for Web projects must offer a high quality of use for persons interacting with the website. Agile project management methods (e.g., Scrum) are used for the management of modern Web projects in order to respond to changes in customer requirements and constraints as the project progresses. The project manager is responsible for the efficient and result-oriented programming of the Web project.

1.5 Problem Definition

The project is to anticipate the impact of using the traditional web-based online examination systems for our university. All the systems that are used to continue the academic activities, especially during this pandemic, are third party programs that have both advantages and disadvantages. Also, most of them, especially programs that used to take exams, have many limitations. As a result, faculty members have to use different web applications to teach the students and take exams.

1.6 Project Contribution

The main contribution of the project is to present an extensive understanding of how to bring about the examination system remotely through a web platform. Now a web platform is supported in almost all kinds of devices that can access the web. However, the goal of this project is to construct a website for devices that are helpful for online exams like laptops, tablets, and smartphones. The final prototype covers the basic design and functionalities of LU Exam Hive like generating questions, posting them, process of student giving exam and retrieving the result.

Chapter – 2

Background

2.1 Primary Focus

The modern education system has been favored a lot by web technologies. Now educational institutions making automated systems that easy to maintain and bring flexibility to the infrastructure. As for taking exams, almost all educational institutions were following the traditional method of taking exams at the exam hall which they should. But in the recent time when the COVID 19 started spreading out and institutions has to close unexpectedly. We had no choice but to stay at home and institutions started their academic activities online like taking classes and tests. They were using various web apps and websites that make the work easy for them. But these various web apps or websites were different from each other. Some have many features, some have less, some are very complex, some are so simple that they missed out on a lot of things. And most lot of them require money for to use their advanced features.

We came up with the idea of creating a web-based online examination system for our final year project that is for our university which would not have any kind of special requirement or anything that makes taking an exam online inflexible for the teachers. Our main focus is to create a web-based online examination system for our university, so the teachers do not have to depend on other third-party websites to take exams. And we believe as Leading University is one of the most prestigious university in Sylhet and in whole Bangladesh, we should have our own online platform for teachers and students to take part in exams. And the recent time had shown us how things could change at any time. So, it's always good to have an alternative way of taking exams for the university. And the most efficient, reliable way would be through websites or web-based online examination system.

2.2 Prerequisites and Key Reasons

Our proposed project, the "LU Exam Hive," is essentially an online examination system for Leading University. And the core reasons are:

- Leading University does not have its online examination system.
- The sudden pandemic occurrence made us realize we need an online solution for taking exams remotely.
- Other third-party solutions are inflexible for a lot of reasons.
- Leading University could have their own solution.
- Leading University teachers do not have to rely on third-party solutions.

The prerequisites would be to have a better understanding of how the web works. Then plan a solution for the whole scenario. Then construct a design of the solution. Then to put this on the web and provide it its required functionalities. Implement with the markup, programming language, creating database, and all other necessary things that require to full fill the project. And the most important thing is to make sure that we can do it.

2.3 Execution Plan

First up, we have to acquire the essential knowledge of the fundamentals like the required programs, programming languages, and other necessary things to build the project. The Scrum approach would be followed to execute the project. The Scrum approach is a general Agile method and its focus on managing iterative development rather than specific agile practice.

Three phases of Scrum:

- The initial phase, the planning where the objectives for the project and software architecture design are established.
- Followed by a series of sprint cycles, where each cycle develops an increment of the system.
- The last phase, the project closure phase wraps up the project, completes required documentation such as system help frames and user manuals.

It is expected to conclude the project in time, within a number of sprint cycles. The project work will be conducted by our project supervisor 'Minhazul Haque Bhuiyan'. Supervisor would be reported, after the development of a major increment of the project.

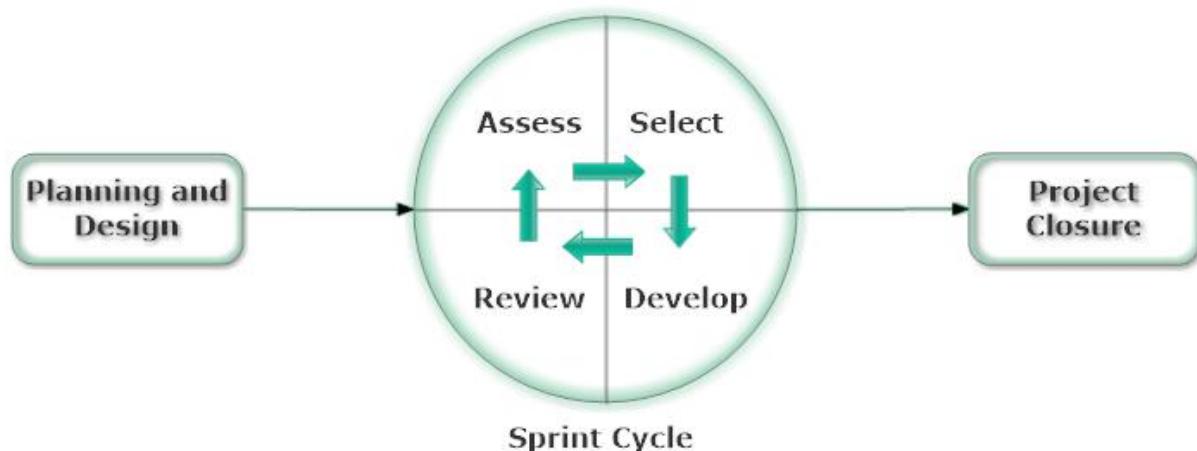


Figure 1: The Sprint Cycle of Scrum.

2.4 Expected Outcome

As we proceed throughout the final year project, obviously we need to set the goal of what we want to achieve. The proposed project LU Exam Hive is an online examination platform. And as we stated in the project proposal, the desired outcome of the project would be to; provide a fully functional web-based online examination system for Leading University. It will have three types of users. 1. Teacher, 2. Student, 3. Admin.

Primarily as of our plan, the users will have the following functionalities:

1) Teacher:

- Login and logout.
- Create questions and make them available for students.
- A dashboard to manage questions, and other functionalities.
- Edit the question before making them available for students.
- See the answer script of students and mark them.

2) Student:

- Login and logout.
- See available questions.
- Select and write answers for the specific set of question.
- Submit the answer script.

3) Admin:

- Login and logout.
- Receive and review contact messages.
- Modify, change, delete, or add data through an UI rather than doing it from the database.

Chapter – 3

System Analysis

3.1 Existing System

Throughout our university time, especially during the pandemic situation. We have experienced the use of many web-based online examination systems. The most notable of them are the Google Form and the FlexiQuiz. Though there are many systems like these available, these two are very common and used widely. Other websites like the "think exam" have many features like Question Bank, Candidate Management, Test Creation, Monetize, Test Taker Panel, Optimum Reporting System, etc. Per questions, a user can have only 30 other people take the exam in the free trial, which is also only for 30 days. SpeedExam is another popular platform for taking exams online and just like "think exam," it requires money to get advanced features. Every system has somewhat identical features but most of them vary from one another. Google Form is mainly a service that helps someone to take surveys via form and it is one of the best. As it is a survey administration software or system it is not very effective for taking academic exams. As a result, our faculty members use FlexiQuiz along with Google Form for its flexibility in taking exams and providing results.

3.2 Drawbacks of Existing System

- Features of them vary from one another.
- Some have most of the features but, features are limited for non-premium users.
- Free systems do not have most of the required functionalities.
- One system that does not provide a particular service, may be available in another system.
- As a result, users may have to use more than one system.
- All of these systems are third party and none of them belong to Leading University.
- User data including all data of student's exams are stored in a third-party database.
- Full version systems are paid one.

3.3 Proposed System

The proposed system entitled "LU Exam Hive" is going to be an own product Leading University. That would be maintained by the staff including; faculty members of Leading University. And also, would be used by the students for the exams that require to take online. As of now, it will only be available for the Department of Computer Science and Engineering. Teachers can have a platform to take the exam remotely with advanced features and they do not have to pay for it.

3.4 Advantages of Proposed System

- Teachers would not have to pay to use its advanced features.
- Almost all required features are available.
- Any modification or any features can be included, according to user's need.
- Leading University stuff will have full control over the system.

Chapter – 4

Requirement Specification

Having explored a few existing web-based online examination systems and determining the functionalities of LU Exam Hive. We have initially come to a conclusion. And this chapter describes all the requirements for LU Exam Hive. Our team will develop the Online Examination System for Leading University

4.1 Overall Description

4.1.1 Product Function

The Online Examination System LU Exam Hive (LUEH) provides a range of features and functionalities. It is a system that enables the students and teachers of Leading University to take online exams more conveniently. Following are a list of some of the functionalities that the website will provide:

- Administrator user.
- Supports multiple users.
- The administrator can control users.
- User registration and login.
- OTP Verification.
- Dashboard for all users.
- Create questions.
- Manage questions.
- Take exam.
- Prepare result.
- Displaying individual results.
- Lists of posted questions.
- Personalized table of questions.

4.1.2 User Classes and Characteristics

LUEH General Members and non-members:

Most of the general users of the LUEH are familiar with web browsers and web-based interfaces and interactions.

Teachers and Students:

Teachers and Students are good enough in almost all web-based online examination system operations as well as familiar with the basic interactions of websites.

System Manager:

The system manager is a technical person who has expert knowledge to operate the online examination system. He is also familiar with website management operations.

4.1.3 Constraints

The following are a general list of constraints that would delimit the developer's options while building the LUEH:

1. The system shall be able to use the MySQL database.
2. The system shall be able to run on most web browsers like Chrome, Opera, Firefox, Safari, Microsoft Edge.
3. The system shall be able to run on mobile devices like Android and IOS.
4. The system shall never store historical data of a user only information related to exams and management purposes.

4.1.4 Assumptions and Dependencies

As website reliability depends on its server and good server with higher performance is very costly. We assume that we will have to "pave our own way" concerning programming the majority of the website and the database, due to the mostly closed-source and secretive nature of major online examination systems. For what we cannot find from open documentation and research, it is assumed that we will have to deduce how LUEH standards and database work from observing external behaviors found in existing online examination systems, and we will have to replicate the results using our own code and design.

4.2 External Interface Requirements

4.2.1 User Interfaces

User interfaces for all users will be graphical user interfaces (GUI). These GUI will be web-based and accessible via a web browser.

Teachers:

The teacher interface would enable the teacher to perform all the functionalities which the system provides for this type of user. Teachers will be able to log in, create questions, see submitted answers, make results, log out, etc.

Students:

This interface allows the students to register, log in, see personalized questions, take exams, logout. These features will also be available through the web interface.

System manager or Admin:

The system manager interface would enable the manager to perform all the functionalities which the system provides for this type of user. Moreover, he will also be able to control the database and take action if required.

Non-members:

Any outsider who's not a teacher, student or a staff of leading university, will just be able to interact with and visit the index page of the website.

4.2.2 Hardware Interfaces

1. Regular PC:

- **Processor:** Dual Core of Higher (SSE3 capable).
- **Ram:** 2GB or Higher.
- **Hard Disk Space:** 1GB or Higher.

4.2.3 Software Interfaces

To build the website it will require some software that helps to make a website. A modern browser, a text editor, a local server software, etc. More about software interface will be discussed in Chapter 6: Software Requirements.

4.3 System Features

4.3.1 Functions

4.3.1.1 Authentication

Requirements ID	Functions.Authentication.Login
Title	Login
Description	The users shall be able to login into the LUEH by entering their email and password
Identifier/Source	Minhazul Haque Bhuiyan, Project Supervisor, in a virtual meeting on 02.11.2020
Rationale	The system would have to distinguish users so that they are only authorized to view the data that is meant for them
Restrictions & Risks	User might forget username/password
Dependencies	For Student: Functions.Authentication.Register

Requirements ID

Functions.Authentication.Logout

Title	Logout
Description	The logged in users shall be able to logout of the system
Identifier/Source	Minhazul Haque Bhuiyan, Project Supervisor, in a virtual meeting on 02.11.2020
Rationale	Authorized users may want to leave LUEH
Restrictions & Risks	N/A
Dependencies	Functions.Authentication.Login

Requirements ID	Functions.Authentication.Register
Title	Register
Description	The student user shall register into LUEH by entering their email and student info before gaining access to other functionalities
Identifier/Source	Team members, in virtual meetings.
Rationale	The system would have to distinguish users so that they are only authorized to view the data that is meant for them
Restrictions & Risks	Student user may try to register more than once
Dependencies	For Students: Functions.Authentication.OTP

Requirements ID	Functions.Authentication.OTP
Title	OTP
Description	The student user shall verify their email by using the OTP sent to their email during registration
Identifier/Source	Team members, in virtual meetings.
Rationale	The system would have to identify users as real person
Restrictions & Risks	Valid email address required
Dependencies	N/A

Requirements ID	Functions.Authentication.Forget.Password
Title	Forget Password
Description	The student user shall reset their password by the link sent to their email in case they forgot it.
Identifier/Source	Team members, in virtual meetings.
Rationale	Users may forget their password
Restrictions & Risks	Valid email address required
Dependencies	Functions.Authentication.Register

4.3.1.2 Manage Question

Requirements ID	Functions.ManageQuestion.Create Question
Title	Create Question
Description	The teacher user shall be able to add or create new question to the LUEH database
Identifier/Source	Minhazul Haque Bhuiyan, Project Supervisor, in a virtual meeting on 02.11.2020
Rationale	This is needed to add data regarding new question
Restrictions & Risks	N/A
Dependencies	N/A

Requirements ID	Functions.ManageQuestion.Post Question
Title	Post Question
Description	The teacher users shall be able to post the created questions
Identifier/Source	Team members, in virtual meetings.
Rationale	The teacher users shall be able to post the question so it will be made available for the student users.
Restrictions & Risks	N/A
Dependencies	Functions.ManageQuestion.Create Question

Requirements ID	Functions.ManageQuestion.View Question
Title	View Question
Description	The users shall be able to view a list of available questions
Identifier/Source	Team members, in virtual meetings.
Rationale	All the users shall be able to view the question so they know what questions are currently available. The student user can then select the particular question and take the exam.
Restrictions & Risks	N/A
Dependencies	Functions.ManageQuestion.Post Question

Requirements ID	Functions.ManageQuestion.Edit Question
Title	Edit Question
Description	The teacher users shall be able to edit the created questions
Identifier/Source	Team members, in virtual meetings.
Rationale	The teacher users shall be able to edit the question before posting.
Restrictions & Risks	Once a question is posted, it shall not be edited
Dependencies	Functions.ManageQuestion.Create Question

Requirements ID	Functions.ManageQuestion.Delete Question
Title	Delete Question
Description	The teacher users shall be able to delete the created questions
Identifier/Source	Team members, in virtual meetings.
Rationale	The teacher users shall be able to delete the question before posting or after the exam is done and after publishing the result.
Restrictions & Risks	Question shall not be deleted during exam.
Dependencies	Functions.ManageQuestion.Create Question

4.3.1.2 Manage Answer

Requirements ID	Functions.ManageAnswer.Submit Answer
Title	Submit Answer
Description	The student users shall be able to submit the answer.
Identifier/Source	Team members, in virtual meetings.
Rationale	The student users shall be able to submit the answer for the particular posted question so teacher will get it.
Restrictions & Risks	Student might try to submit answer twice for the same question.
Dependencies	Functions.ManageQuestion.Post Question

Requirements ID	Functions.ManageAnswer.Generate Result Document
Title	Generate Result Document
Description	The teacher users shall be able to generate result document format.
Identifier/Source	Team members, in virtual meetings.
Rationale	The teacher users shall be able to generate the result in a document format. Preferably in PDF document format.
Restrictions & Risks	Naming constraints might affect the document format.
Dependencies	Functions.ManageAnswer.Submit Answer

4.3.1.2 Manage Users

Requirements ID	Functions.ManageUsers.Add users
Title	Add users
Description	The admin shall be able to add new users.
Identifier/Source	Team members, in virtual meetings.
Rationale	This is needed to add the information about the new members into the LUEH so that they can use the features of the website.
Restrictions & Risks	The admin may add incorrect information about the member
Dependencies	Functions.ManageUsers.Add users

Requirements ID	Functions.ManageUsers.View User Information
Title	View User Information
Description	The admin shall be able to view user's information
Identifier/Source	Team members, in virtual meetings.
Rationale	This is needed so that the admin can see their information if anything goes wrong that needed to be fixed.
Restrictions & Risks	User may not desire to share some informations
Dependencies	Functions.ManageUsers.Add users

Requirements ID	Functions.ManageUsers.Remove Users
Title	Remove Users
Description	The admin shall be able to remove users.
Identifier/Source	Team members, in virtual meetings.
Rationale	This is needed so that the admin can remove users when necessary.
Restrictions & Risks	N/A
Dependencies	Functions.ManageUsers.Add users

4.3.1.3 Backup

Requirements ID	Functions.Backup.Backup data
Title	Backup data
Description	The admin shall be able to back up the entire database of the LUEH.
Identifier/Source	Team members, in virtual meetings.
Rationale	This is to prevent data loss if the system data gets corrupted
Restrictions & Risks	The admin may not always be available for backup.
Dependencies	N/A

4.3.1.4 Performance Requirements

Requirements ID	PerformanceReq.SimultaneousAccess
Title	Simultaneous access to system
Description	The website shall be able to handle up to 100 users simultaneously accessing the system
Identifier/Source	Team members, in virtual meetings.
Rationale	The system won't be busy when people want to access the system
Restrictions & Risks	The web server may not be able to handle that much users.
Dependencies	Web Server

Requirements ID	PerformanceReq.Total users
Title	Total users
Description	The website shall be able to have 1500 members
Identifier/Source	Team members, in virtual meetings.
Rationale	So LUEH can register new members, potential in all Leading University is 6000, CSE Dept. has around 800 or more members
Restrictions & Risks	The web server may not be able to handle that much users.
Dependencies	Web Server

Requirements ID	PerformanceReq.Throughput
Title	Throughput
Description	The website shall be able to have 1500 members
Identifier/Source	Team members, in virtual meetings.
Rationale	The throughput time of internet shall be a maximum of five seconds
Restrictions & Risks	Users internet may not be reliable
Dependencies	Users ISP or Internet Service Provider

4.4 Website Attributes

4.4.1 Reliability

1. The LUEH should perform its operations and functionalities without any crash.
2. The LUEH should be able to recover from data loss during website down period, etc.

4.4.2 Availability

1. The LUEH website should be available at all times, even during database backups and recoveries. And except during the server down time which should not be long.

4.4.3 Security

1. There will be proper user privileges according to the user type i.e., Teacher or Student.
2. Users will be able to login into the system only by using his or her email and password.
3. Passwords will be encrypted, even admin will not see or understand user's real password.
4. No historical data about users will be saved in the system.

4.4.4 Maintainability

The system manager or admin may need to maintain and monitor the website when too many users try to access and performs various functionality.

4.4.5 Portability

1. The LUEH website will run its web interface on any operating system that has a web browser installed.
2. LUEH will be fully responsive so any device with a browser can run it.
3. The LUEH web server would be portable to any other server that supports Apache.

Chapter – 5

System & Database Design

5.1 System Design

Systems design is the process of defining elements of a system like modules, architecture, components and their interfaces and data for a system based on the specified requirements. It is the process of defining, developing and designing systems which satisfies the specific needs and requirements of a business or organization.

A systemic approach is required for a coherent and well-running system. Bottom-Up or Top-Down approach is required to take into account all related variables of the system. A designer uses the modelling languages to express the information and knowledge in a structure of system that is defined by a consistent set of rules and definitions. The designs can be defined in graphical or textual modelling languages. Some of the popular examples of graphical modelling languages are:

- Unified Modelling Language.
- Flowchart etc.

Unified Modelling Language:

UML stands for Unified Modeling Language. It's a rich language to model software solutions, application structures, system behavior and business processes. The purpose of a use case diagram in UML is to demonstrate the different ways that a user might interact with a system. There are two main categories i.e., Structure diagrams and Behavioral diagrams.

- Structure diagrams show the things in the modeled system. In a more technical term, they show different objects in a system.
- Behavioral diagrams show what should happen in a system. They describe how the objects interact with each other to create a functioning system.

Design methods:

Design methods are procedures, techniques, aids, or tools for designing. They offer a number of different kinds of activities that a designer might use within an overall design process.

Some popular design methods:

- Architectural design
- Logical design
- Physical design

5.1.1 USE CASE DIAGRAM (LU Exam Hive)

Use case diagrams give a graphic overview of the actors involved in a system, different functions needed by those actors and how these different functions interact. It's a great starting point for any project discussion because you can easily identify the main actors involved and the main processes of the system.

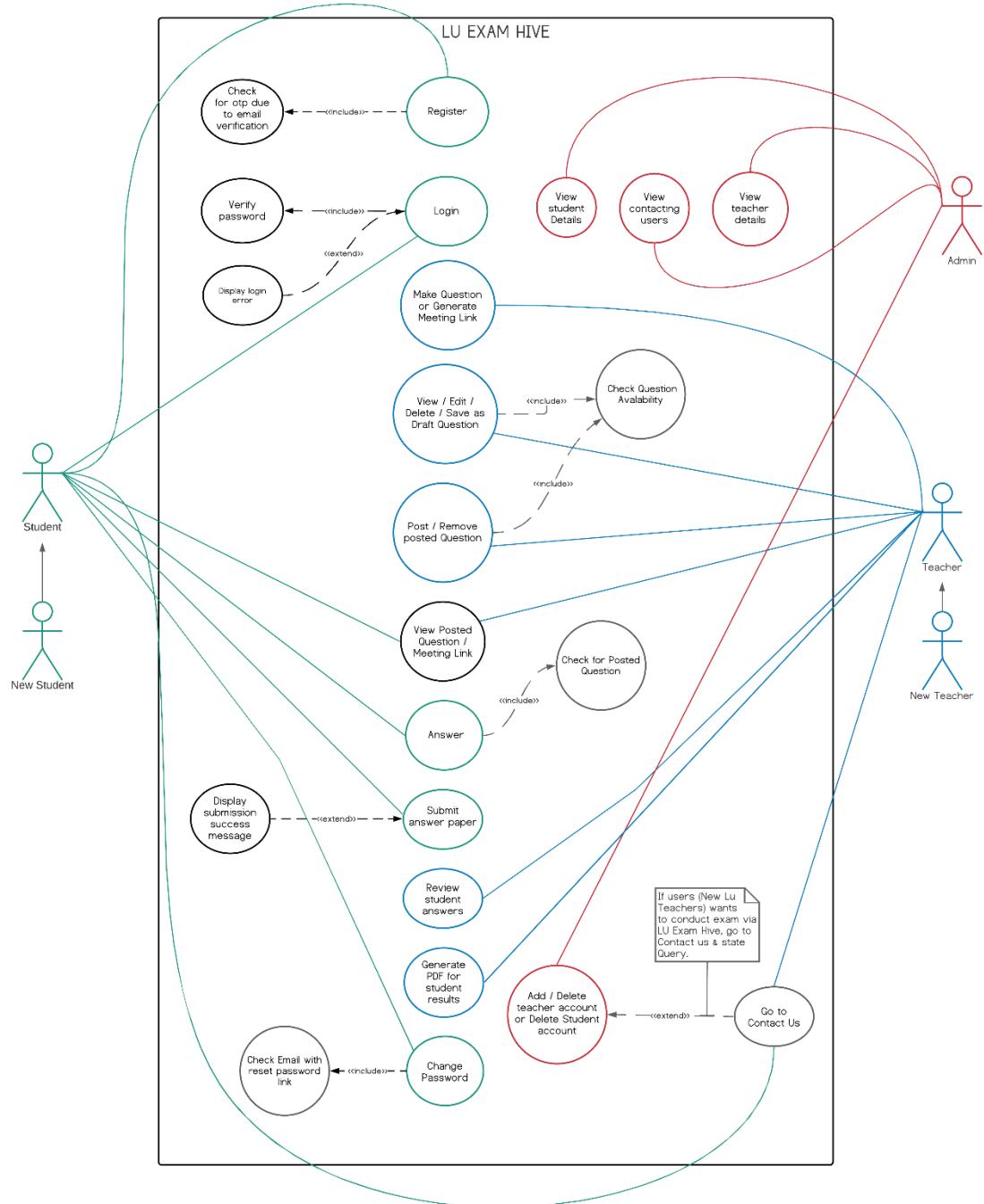


Figure 2: Use Case Diagram for LU Exam Hive

5.1.2 Activity Diagram (LU Exam Hive)

Activity diagrams represent workflows in a graphical way. They can be used to describe the business workflow or the operational workflow of any component in a system. Sometimes activity diagrams are used as an alternative to State machine diagrams. Activity diagrams are the perfect UML solution for visualizing process flows. Activity diagrams in UML are a great solution to visualize the actions, outcomes, and flows within a specific process and the behaviors that pair with them. An activity diagram is used to create a simple overview of any process to better identify areas for improvement or model software architecture to help better understand what's going on.

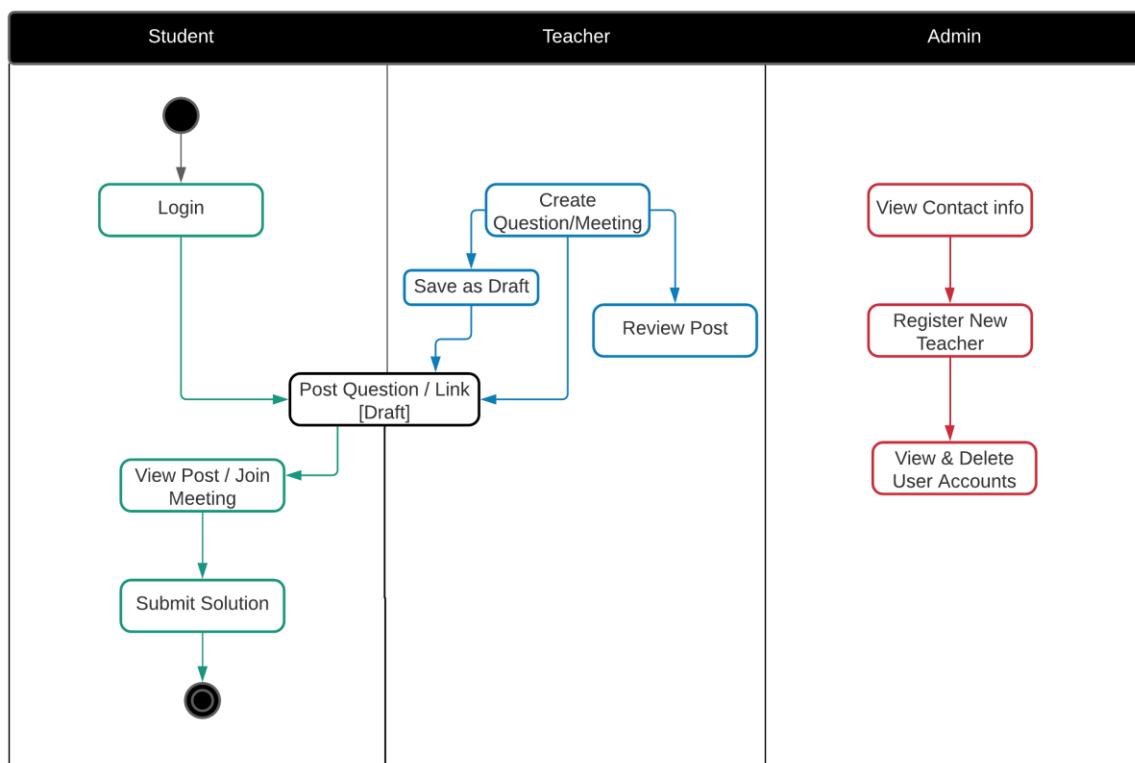


Figure 3: Activity Diagram for LU Exam Hive

5.1.3 System Sequence Diagrams (LU Exam Hive)

A system sequence diagram is a type of sequence diagram in UML. These charts show the details of events that are generated by actors from outside the system.

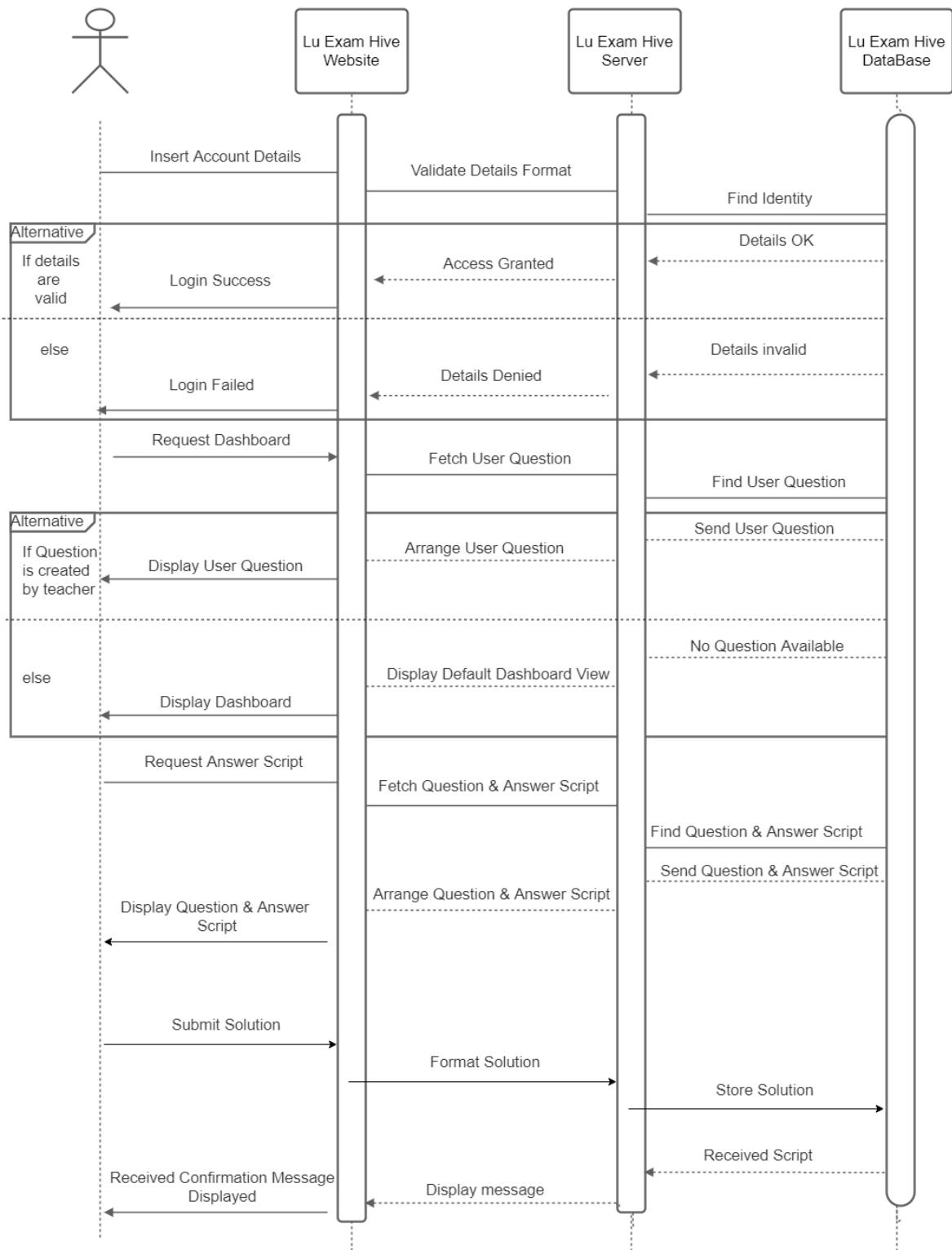


Figure 4: Sequence Diagrams for LU Exam Hive

5.1.4 Class Diagram (LU Exam Hive)

Class diagrams are the foundation for all other UML structure diagrams. Class diagrams are the main building block of any object-oriented solution. It shows the classes in a system, attributes, and operations of each class and the relationship between each class.

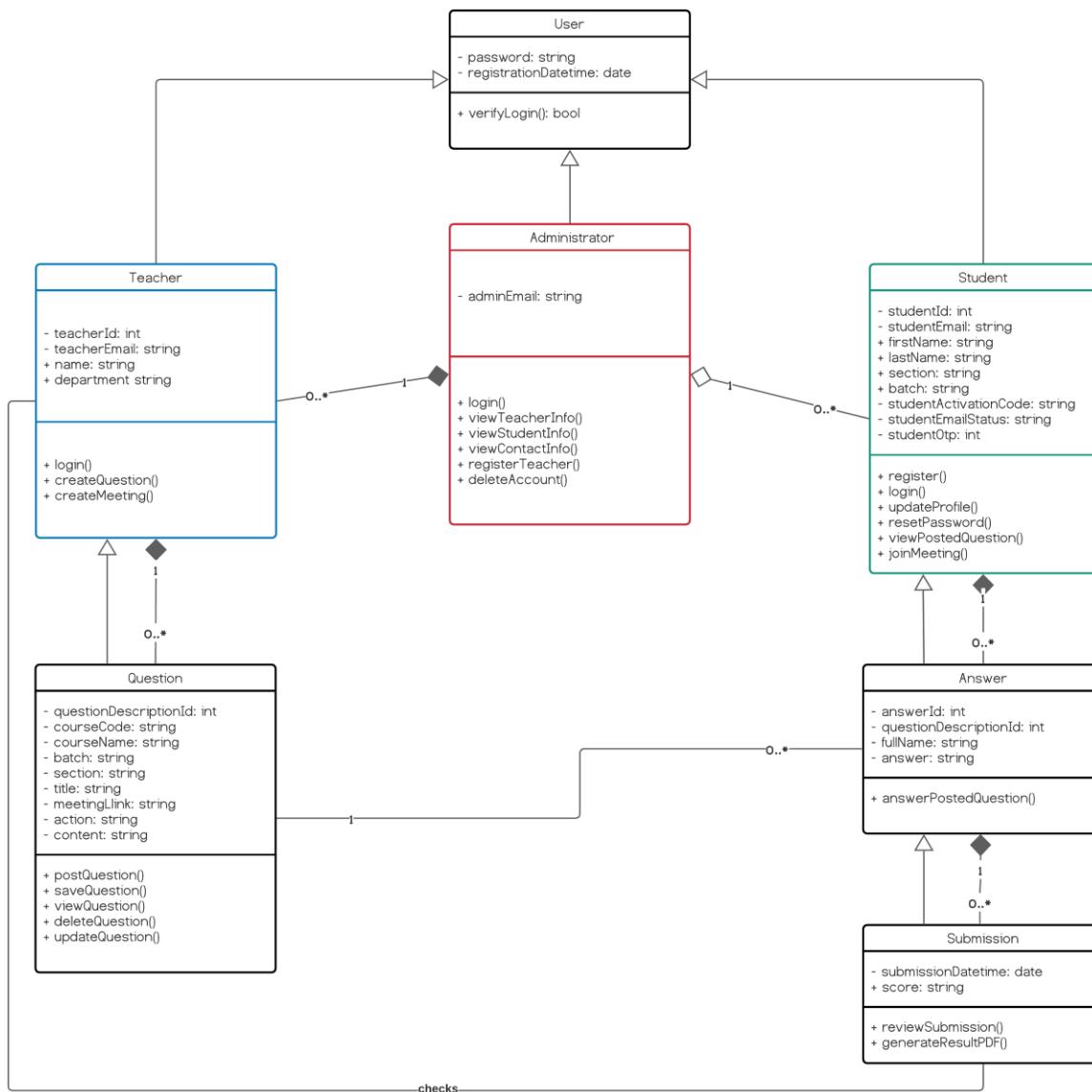


Figure 5: Class Diagram for Lu Exam Hive

5.2 Database Design

Database Design is a collection of processes that facilitate the designing, development, implementation and maintenance of enterprise data management systems. Properly designed databases are easy to maintain, improves data consistency and are cost effective in terms of disk storage space. The database designer decides how the data elements correlate and what data must be stored. The main objectives of database designing are to produce logical and physical designs models of the proposed database system.

The logical model concentrates on the data requirements and the data to be stored independent of physical considerations. It does not concern itself with how the data will be stored or where it will be stored physically. The physical data design model involves translating the logical design of the database onto physical media using hardware resources and software systems such as database management systems (DBMS).

There are two types of Database Techniques:

- Normalization
- ER Modeling

Normalization:

Normalization is a database design technique that reduces data redundancy and eliminates undesirable characteristics like Insertion, Update and Deletion Anomalies. Normalization rules divides larger tables into smaller tables and links them using relationships. The purpose of Normalization in SQL is to eliminate redundant (repetitive) data and ensure data is stored logically.

ER-Diagram:

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how “entities” such as people, objects or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs.

5.2.1 ER-Diagram (LU Exam Hive)

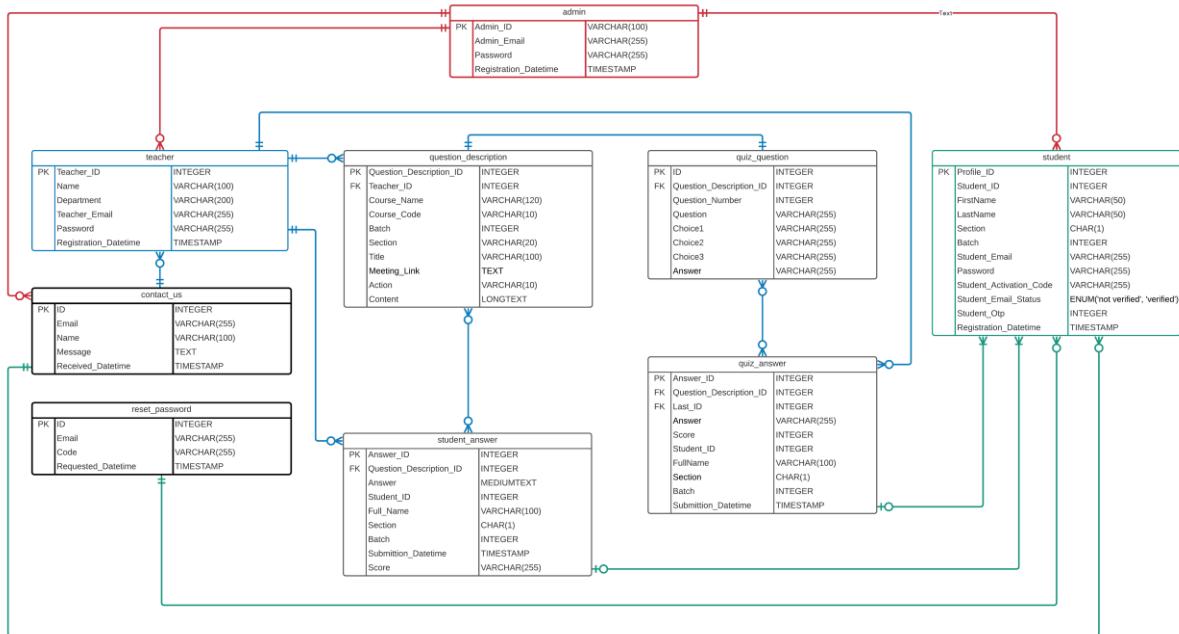


Figure 6: ER Diagram for Lu Exam Hive

Chapter – 6

Software & Other Tool Requirement

It requires a number of tools like programming language, scripting language, markup language, and some software to write the programs, host a server locally, etc. In this chapter; the software, tools, and other components that are used to construct the LU Exam Hive website are discussed.

6.1 XAMPP

XAMPP is an open-source software distribution that provides a local server to host a website directly from your local machine or computer, database, command-line executables, and other modules.

We used XAMPP version 8.0.0 for windows that comes with Apache web server, phpMyAdmin MySQL database, Php as command-line executable.

6.2 HTML5

Hypertext Markup Language (HTML) is the standard markup language for documents designed to be displayed in a web browser. It is a system that allows the modification of the appearance of web pages, as well as making adjustments to their appearance. It also used to structure and present content for the web. HTML5 is the latest version of HTML. We used HTML5 to mark up the web page components of LU Exam Hive.

6.3 CSS3

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. While HTML is used to structure a web document defining things like headlines and paragraphs, and allowing you to embed images, video, and other media, CSS comes through and specifies your document's style like page layouts, colors, and fonts are all determined with CSS.

Essentially, we used Bootstrap which is a CSS framework, to style the markup of LU Exam Hive.

6.4 Bootstrap 4.6

Bootstrap is the most popular CSS Framework for developing responsive websites. It is a free and open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS- and (optionally) JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components. At the time of building LU Exam Hive, Bootstrap version 4.6 was the stable version. And we integrated it in our website.

6.5 JavaScript

JavaScript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities.

JavaScript is:

- Light Weight Scripting language
- Dynamic Typing
- Object-oriented programming support
- Functional Style
- Platform Independent
- Prototype-based
- Interpreted Language
- Async Processing
- Client-Side Validation
- More control in the browser

The JavaScript code is executed on the user's processor instead of the web server thus it saves bandwidth and load on the web server. Any JavaScript-enabled browser can understand and interpret JavaScript code. Any JavaScript code can be executed on different types of hardware a JavaScript program written for. It encompasses all the capabilities of a procedural language. Branching, looping, condition checking are some of those capabilities that can be executed on a web page.

It has a number of plugins and libraries available to make JavaScript simpler. jQuery is one of them. Bootstrap 4.6 uses the jQuery plugin.

6.6 jQuery

jQuery is a JavaScript library designed to simplify HTML DOM tree traversal and manipulation, as well as event handling, CSS animation. The main purpose of jQuery is to provide an easy way to use JavaScript on website to make it more interactive and attractive. It is also used to add animation.

Its features include:

- HTML manipulation
- DOM manipulation
- DOM element selection
- CSS manipulation
- Effects and Animations
- Utilities
- AJAX
- HTML event methods
- JSON Parsing
- Extensibility through plug-ins

Bootstrap 4.6 behind the scene uses jQuery. Bootstrap uses jQuery for JavaScript plugins like modals, tooltips, etc. To make this work with Bootstrap, the jQuery CDN is added in the project files. LU Exam Hive has some Bootstrap components that works with jQuery but we didn't have to write the jQuery codes as it is already working behind the scene when we include the particular component or utilities of Bootstrap.

6.7 PHP

PHP is a server-side scripting language. that is used to develop Static websites or Dynamic websites or Web applications. PHP stands for Hypertext Pre-processor, which earlier stood for Personal Home Pages. PHP scripts can only be interpreted on a server that has PHP installed. The client computers accessing the PHP scripts require a web browser only. PHP is well suited for web development and can be embedded into HTML. It is most popular and frequently used worldwide scripting language, the main reason of popularity is; It is open source and very simple. PHP is:

- Very simple, compared to other scripting languages.
- PHP is an interpreted language. So, there is no need for compilation.
- PHP is faster than other scripting languages like ASP and JSP.
- It is open-source, meaning one does not have to pay to use PHP.
- PHP is platform-independent. it will run on every platform.
- PHP has some predefined error reporting constants that are very useful while debugging.
- PHP supports variable usage without declaring its data type. It will be taken at the time of the execution based on the type of data it has on its value.
- PHP has inbuilt support for working hand in hand with MySQL database management systems and it also can be used with other database management systems like Postgres, Oracle, etc.

The PHP that comes with our version of XAMPP is PHP 8.0 which is the latest version of PHP that more reliable and comes with some new features.

A PHP file can be identified with the .php file extension. An example of the basic syntax of PHP code is given below:

```
<?php  
    echo "Hello World";  
?>
```

As PHP is well suited for website development and it can be embedded into HTML. It is easier to maintain the web page markup; HTML codes, and the required PHP script of that web page in the same document instead of creating separate document files for HTML and PHP code. Both can be embedded in the same file that is a PHP file with .php extension.

All of the web view document files of LU Exam Hive that are PHP files that contains both of the page markups and php scripts.

6.8 MySQL

LU Exam Hive is a web-based online examination system that will have a lot of data to deal with. For that, we have DBMS or database management system. LUEH used to the MySQL DBMS. MySQL is an open-source relational database management system (RDBMS). A relational database organizes data into one or more data tables in which data types may be related to each other; these relations help structure the data.

SQL:

SQL is a language programmer use to create, modify and extract data from the relational database, as well as control user access to the database. In addition to relational databases and SQL, an RDBMS like MySQL works with an operating system to implement a relational database in a computer's storage system, manages users, allows for network access and facilitates testing database integrity and creation of backups.

MySQL is free and open-source software under the terms of the GNU General Public License and is also available under a variety of proprietary licenses. It has stand-alone clients that allow users to interact directly with a MySQL database using SQL, but more often MySQL is used with other programs to implement applications that need relational database capability.

Reasons for using MySQL:

- MySQL consists of a solid data security layer that protects sensitive data from intruders. Also, passwords are encrypted in MySQL. Although we used other password techniques to encrypt passwords for more security.
- It follows the working of a client/server architecture. There is a database server (MySQL) and arbitrarily many clients (application programs), which communicate with the server; that is, they can query data, save changes, etc.
- It is considered as one of the very fast database languages, backed by a large number of the benchmark test.
- MySQL allows transactions to be rolled back, commit, and crash recovery.
- Provides a unified visual database graphical user interface tool. We can access the MySQL GUI by starting the MySQL module on the XAMPP software.
- MySQL is faster, more reliable, and cheaper because of its unique storage engine architecture.
- MySQL is free and comes with the XAMPP software.
- It provides very high-performance results in comparison to other databases without losing an essential functionality of the software.
- It has fast loading utilities because of the different cache memory.

PHP works very well with MySQL. LU Exam Hive used MySQL that comes with XAMPP 8.0.0.

Storage Engine:

Storage engines are MySQL components, that can handle the SQL operations for different table types to store and manage information in a database. LU Exam Hive database management system used the InnoDB storage engine. InnoDB is mostly used general-purpose storage engine. InnoDB is a robust storage engine that offers:

- Full ACID compliance.
- Commit, rollback, and crash-recovery.
- Row-level locking.
- FOREIGN KEY referential-integrity constraints.
- Increase multi-user concurrency (via non-locking reads).

With the above functionality that InnoDB offers, it is obvious why it is the default MySQL engine. It is an engine that performs well and offers many of the required attributes that any database would need.

6.9 Apache

Apache is a free and open-source cross-platform web server software. It is a powerful Web server program with features that compare to its high-priced competitors. The software includes an administration control panel, customizable error messages, and authentication schemes. The virtual hosting module allows you to run multiple websites from the same server. The resources for Apache are available on multiple websites around the world. This allows server owners to access reference articles and live help whenever necessary. This gives Apache a major advantage over programs that only have a company website as a source of support. When a new bug is found, the open-source user community typically creates a patch to fix it and posts the solution for free on forums and social media websites.

LU Exam Hive uses Apache web server that comes with XAMPP software. This XAMPP Apache server gives a suitable environment for testing MYSQL, PHP, and Perl projects on the local computer. During the building process of LU Exam Hive, we constantly used it to test the website in our local computer server. And we used Apache as server, it will be easy to transfer the website in a live Apache web server after the completion of the LU Exam Hive project.

Reasons for using Apache:

- Compatible with PHP.
- Loadable dynamic modules.
- Handling of static files.
- Auto-indexing.
- Supports HTTP/2.
- FTP connections, etc.

6.10 Git & GitHub

Git:

Git is software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during software development. Its goals include speed, data integrity, and support for distributed, non-linear workflows. It is the most commonly used version control system. Git tracks the changes that are made in files, so the user has a record of what has been done, and the user can revert to specific versions if they ever need to. Git also makes collaboration easier, allowing changes by multiple people to all be merged into one source. Git software runs locally. Users' files and their history are stored on their computer. Users can also use online hosts such as GitHub or Bitbucket to store a copy of the files and their revision history.

GitHub:

GitHub is a cloud-based project management and organization platform that incorporates Git's version control features. Meaning, all GitHub users can track and manage changes being made to the source code in real-time while having access to all of the other Git functions available to them at the same place.

GitHub essentials are:

- Repositories
- Branches
- Commits
- Pull Requests
- Git (the version control software GitHub is built on)

GitHub can be used for free and it requires payment for some advanced features. But the free version is the overall package that is used by many developers.

GitHub Desktop:

GitHub Desktop is a software that provides a graphical user interface to interact with GitHub from the desktop. Instead of typing commands in GitHub CLI, GitHub desktop can be used which saves time and is easy to interact with.

GitHub Desktop supports:

- Attributing commits with collaborators.
- Checkout branches with pull requests.
- Push to your remote Git repositories.
- Syntax highlighted diffs.
- And almost everything that GitHub can offer.

We used GitHub to keep track of our project work and GitHub desktop to interact with GitHub cloud instead of depending on the browser. GitHub helped us to monitor our works and if anything went wrong, we could easily revert back to a previous version of the project.

6.11 PHPMailer

PHPMailer is an open-source PHP library to send emails with. It is a way of sending emails programmatically with PHP. Sending emails directly by PHP code requires a high-level familiarity to SMTP standard protocol and related issues and vulnerabilities about Email injection for spamming. PHPMailer is one of the popular solutions for these matters on PHP.

Some of features PHPMailer include:

- Plain text, HTML and multipart batched files.
- SSL and TLS (Secure Sockets Layer and Transport Layer Security).
- SMTP, Qmail, POP3.
- Debugging system.
- PHP sendmail and mail methods.

We integrated PHPMailer in LUEH in order to achieve the functionality of sending OTP verification code during student registration automatically to verify their email. Also, to send reset password link automatically in users email if they request for that from the LUEH website. And to receive emails if someone contacts us using the contact us UI in LUEH.

6.12 Summernote

Summernote is a JavaScript library that helps to create WYSIWYG editors online. Summernote can embed into any website to create a WYSIWYG editor by the CDN or downloading the files directly.

Summernote has a few special features:

- Paste images from clipboard
- Saves images directly in the content of the field using base64 encoding, so you don't need to implement image handling at all
- Simple UI
- Interactive WYSIWYG editing
- Handy integration with server
- Supports Bootstrap 3 and 4 integrities
- Lots of plugins and connectors provided together

For creating questions in LU Exam Hive online examination system, we have embedded Summernote that will provide the teacher users to format the question page just like any other word program like MS Word.

6.13 FPDF

FPDF is a PHP class which allows to generate PDF files with pure PHP. So, essentially it is PHP library that allows to generate PDF files. F from FPDF stands for Free. We have added FPDF in LUEH to generate the exam results in PDF document.

6.14 Visual Studio Code

It requires a text editor to write code on. We mainly used Visual Studio Code to write the required script and codes for LUEH. Visual Studio Code is a free open-source text editor by Microsoft. It has support for development operations like debugging, task running, and version control. One of the main reasons for using VS Code is because of the git integration. It keeps track of which file is being modified. The VS Code user interface allows for a lot of interaction compared to other text editors. To simplify user experience, VS Code is divided into five main regions:

1. The activity bar
2. The side bar
3. Editor groups
4. The panel
5. The status bar

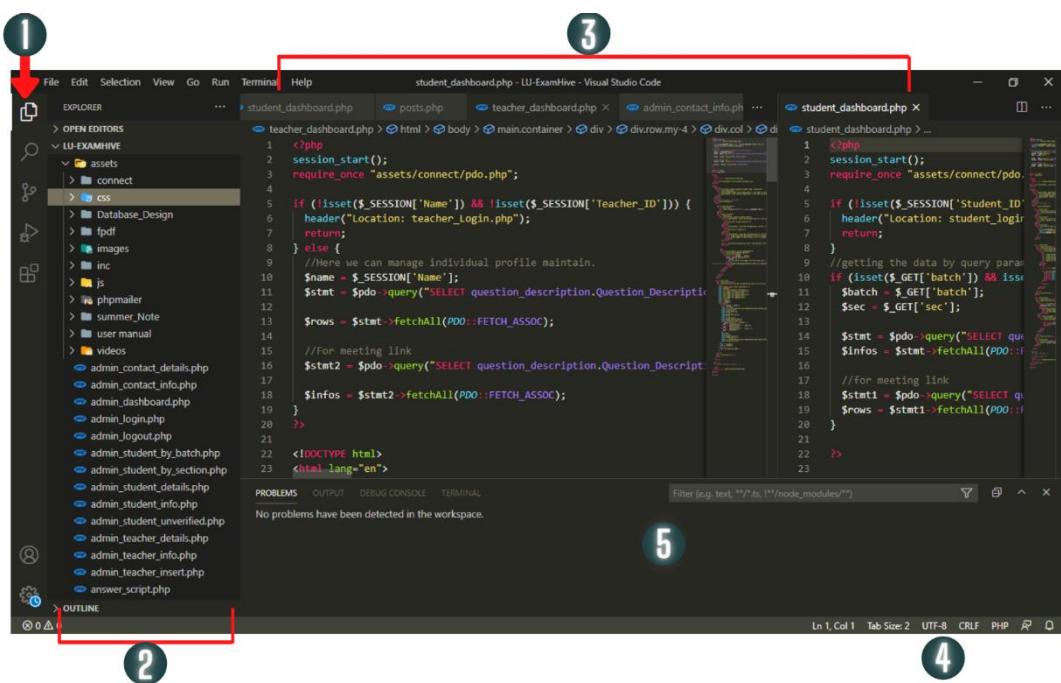


Figure 8: The VS Code Interface

6.15 Browsers and others

Web browsers are essentials in web development to debug, view the web pages during development. Browser like Firefox has DevTools and inspect mode which are very helpful in web development. We used Chrome and Firefox mostly used in our project. Besides, we constantly checked the LUEH website on Microsoft EDGE and Opera browser too.

Chapter – 7

Evaluation

This chapter presents evaluation of the project including platform evaluation, functional evaluation and non-functional evaluation.

7.1 Platform Evaluation

The project mainly deals with the web based Online Examination System. We tried to evaluate the idea of having an Online Exam System for our own university. There are some other such kind of system can be found in the internet. But not every system is capable of doing what we wanted to do. For instance- in some website we can create question and publish it to the students via another platform, not only this if we want to arrange a meeting we need to go and use another special platform. So, all together it's a kind of mess to use all the different platform. It would be easier and user friendly if we could find a solution of having all kinds of necessary functionalities together in one platform. And that was our idea to make this LU Exam Hive where we can have the desire functionalities together at a time. We tried to make it more attractive and user-friendly themes are included for the end user. Most importantly we think it as our own university product which can be used for taking online exam by the teacher of Leading University when necessary.

7.2 General Functional Evaluation

Next, here we will provide a general functional evaluation. We tested each functional requirement. There is the table below showing result of the test.

Functional Requirements in tabular form:

ID	Requirement	Fulfilled?
1.	Teacher can have his/her own dashboard	Yes
2.	Teacher can create new question or quiz	Yes
3.	Teacher can arrange meeting	Yes
4.	Teacher can save a created question or quiz	Yes
5.	Teacher can post a question or quiz	Yes
6.	Teacher can edit or delete the question or quiz which is drafted	Yes
7.	Teacher can see all the posted question	Yes
8.	Teacher can see and download the result as pdf format	Yes

9.	Dynamic question creation	Yes, but not functional for the student users.
10.	Student can register and have the login and logout functionalities	Yes
11.	Student can change the password by using forgot password option	Yes
12.	Student can login to his own dashboard	Yes
13.	A Student can see the all the posted question by the respective teacher	Yes
14.	A Student can see only meeting link created for his/her section	Yes
15.	Students can Join the meeting scheduled by the teacher through the meeting link shown	Yes
16.	A Student can answer the posted question or quiz via the answer script	Yes
17.	Answer Script Clock working	Yes
18.	Admin can monitor and edit all the student and teacher list	Yes
19.	Admin can insert a new teacher to the database	Yes
20.	Admin can delete a teacher or student record	Yes
21.	Admin can sort the verified and unverified student list	Yes
22.	Admin can search any student by ID and have the details of that student	Yes

7.3 Non-Functional Evaluation

7.3.1 Flexibility

The website is flexible to edit and some new functionalities can be added efficiently. Here some functional button can be added in the teacher dashboard if we want to improve the dashboard content. Also, there can be a button called assignment by which a teacher can post an assignment to the student and the code can be added.

The platform is suitable for teacher and students because of its interior design. It is plain and simple also attractive. The website can be accessible from all sort devices like different model of mobile phone also with tablets and with computer. It is fully responsive and functional in different views.

The website is available to use on different kinds of browser which we generally use in our daily life. For instance – Google Chrome, Firefox, Microsoft Edge, Opera and others.

The website loads smoothly from the server and the landing page is operatable very effectively.

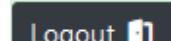
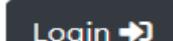
7.3.2 User Interface

The user interface is simple and attractive. An user can easily interact with the interface. There are some points about user interface given below-

- Fully Responsive in all kinds of device.
- Buttons are designed as the user can easily identify which button it can be by just looking at that button. For example- Delete button is colored as red, save button is in Black.



- There are some icons also added to look little different. For example- in login, logout button or in the teacher dashboard edit and delete question function is decorated with the icon.



- Admin has a dashboard UI where he/she can monitor or control the website.

More of UI design are given in chapter 8.

Chapter – 8

GUI Design

8.1 UI Flowcharts

A UI flowchart used to describe the logical relationship between pages. It is a picture of the separate steps of a process in sequential order.

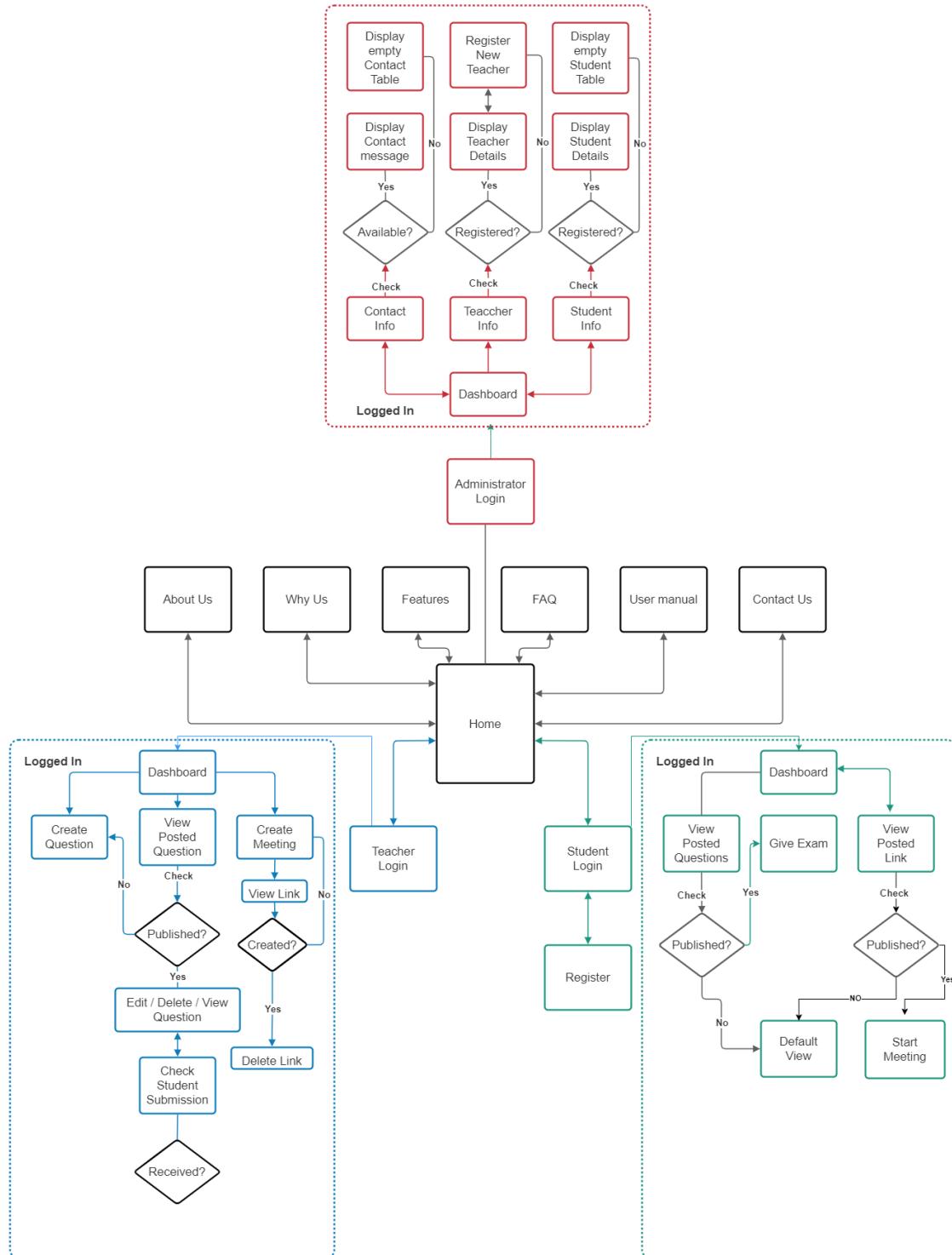


Figure 8: UI Flowcharts of LU Exam Hive

8.2 UI Design

User interface (UI) design is the process designers use to build interfaces in software or computerized devices, focusing on looks or style. Designers aim to create interfaces which users find easy to use and pleasurable.

Graphical user interfaces (GUIs)—Users interact with visual representations on digital control panels. A computer's desktop is a GUI.

8.2.1 Home View (Users)

Home View has links to most of the key pages of the website and also is the place where messages are conveyed to the users i.e., reasons to use the website, selecting their avatar, tips & life hacks for the students & to whom is this site made for.

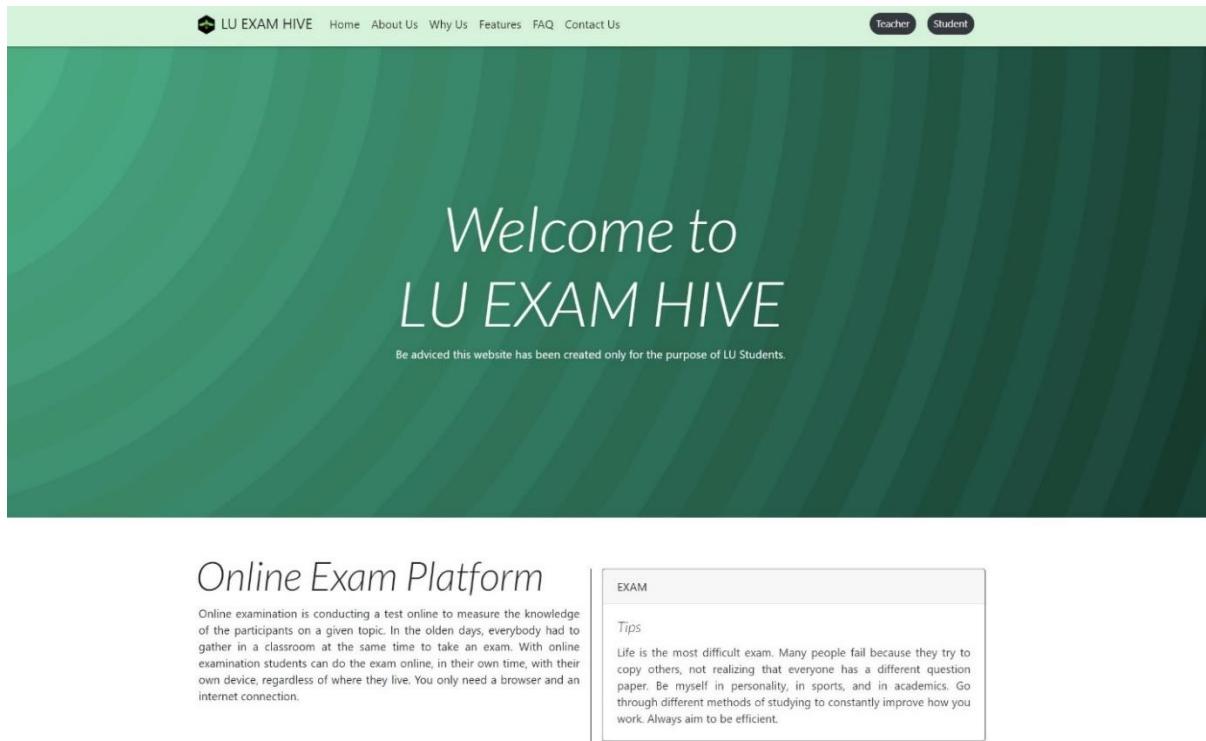


Figure 9: Home View of LU Exam Hive

8.2.2 About Us (Users)

A short Video of the website mainly showing students how to use the platform.

About Us



Success consists of going from failure to failure without loss of enthusiasm.

— Winston Churchill

Note: LEH is a project conducted by a team of 3 people from 44th Batch Leading University, Sylhet.

Figure 10: About Us of LU Exam Hive

8.2.3 Why Exam Hive? (Users)

Key reasons are stated in this section for the users to get onto LU Exam Hive.

Why Exam Hive?



Stay Safe

Stay Home, Stay Safe. During Covid-19 students are advised to remain within the safety of their house premises. Give any of your remaining exams via Lu Exam Hive.



Always Present

Regardless of you or your lecturer missing out on an exam day, remain tension free & contact your teacher to execute exam on Lu Exam Hive.



Video Conferencing

Yes now your favorite video communication mediums (Google meet & Zoom) are integrated with Lu Exam Hive.

Figure 11: Why Exam Hive? of LU Exam Hive

8.2.4 Features (Users)

Attractive features of the website are stated in this section to draw attention of the users.

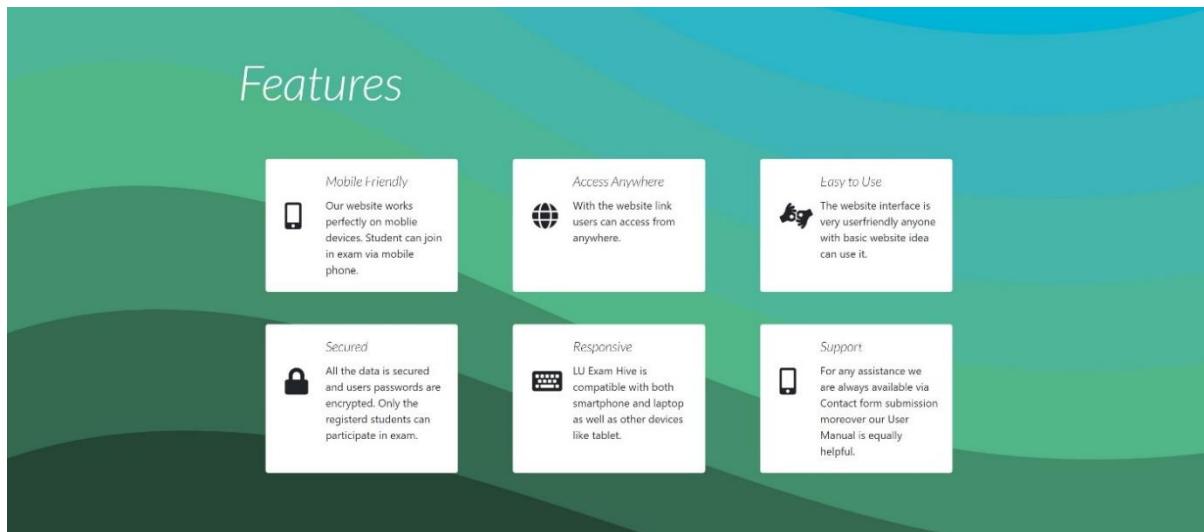


Figure 12: Features of LU Exam Hive

8.2.5 FAQ (Users)

Quick response to curious & common questions of Users are placed in this section.

FAQ

Q. Who is LU Exam Hive for?

Q. How can a new teacher register?

Q. What should I do if I forgot my password? (Student)

Can't remember your password? Don't worry. If you have an existing account you can change your password any time.
Click the link below if you forgot your password. 😊

Link: [Forgot my password.](#)

Q. What to do if I am unable to register with my Student ID and Email?

Q. What should i do if I want to delete my LU Exam Hive Account? (Student & Teacher)

Figure 13: FAQ of LU Exam Hive

8.2.6 Contact Us (Users)

Users can reach out to us with their query regarding any problem related to the website using Contact Us form which is present in almost every page via link.

The screenshot shows the 'Contact Us' page of the LU Exam Hive website. At the top, there is a green header bar with the LU EXAM HIVE logo and a 'Go Back' button. The main title 'Contact Us' is centered above a form. The form includes fields for 'Name' and 'Email Address', a large text area for 'Your text', and a 'Submit' button. Below the form, the footer contains the LU EXAM HIVE logo, links to 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (Facebook, Instagram, LinkedIn) icons. A copyright notice at the bottom states '© 2021 LU EXAM HIVE All rights reserved.'

Figure 14: Contact Us of LU Exam Hive

8.2.7 Login (Teacher)

LU Exam Hive designs UI of Teachers login uniquely which is simple, easy to understand and smooth to use. New teacher will have to reach out to the administrator via contact us form following the procedure provided in the FAQ section to get registered to the site.

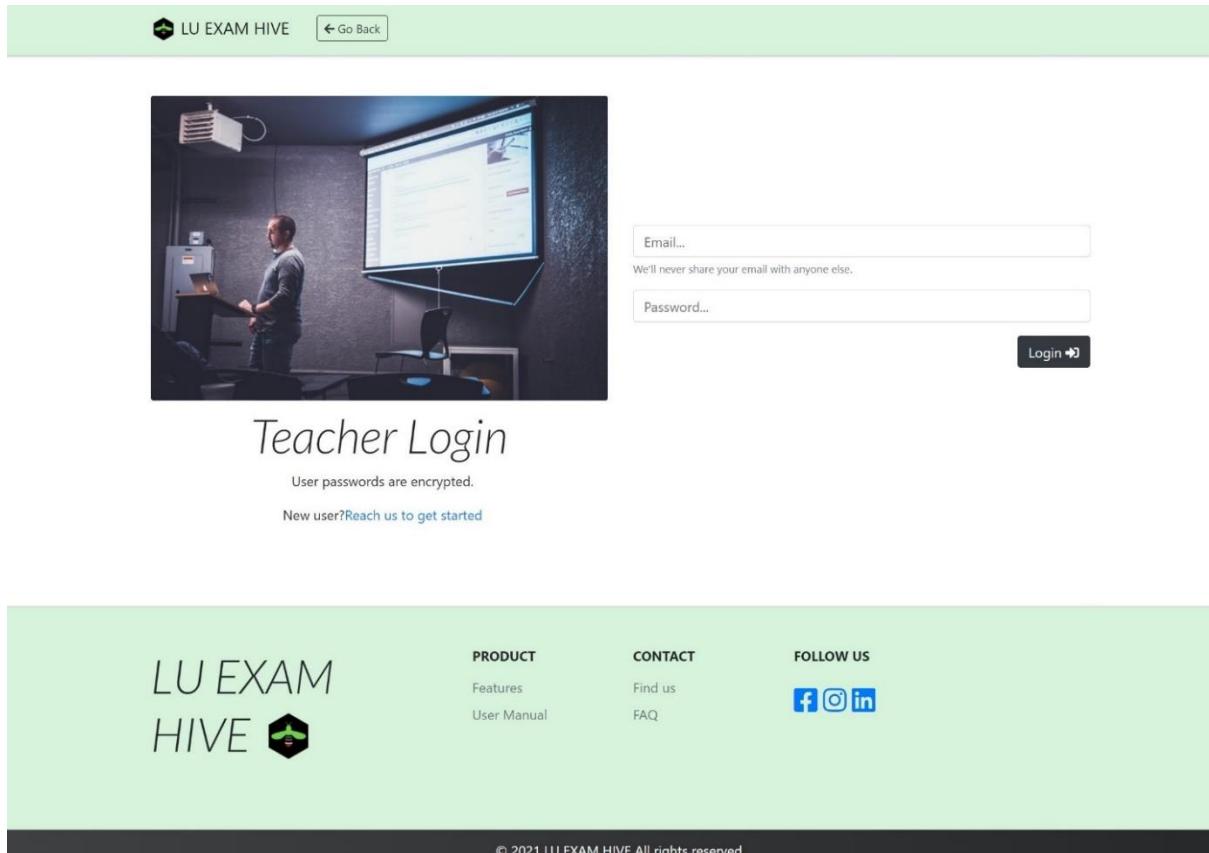


Figure 15: Teacher Login of LU Exam Hive

8.2.8 Login (Student)

LU Exam Hive understands that all students of a university are not familiar with complex UI thus keeping the accessibility aspect of every student in mind the login interface is designed to be simple, clear and easy to understand.

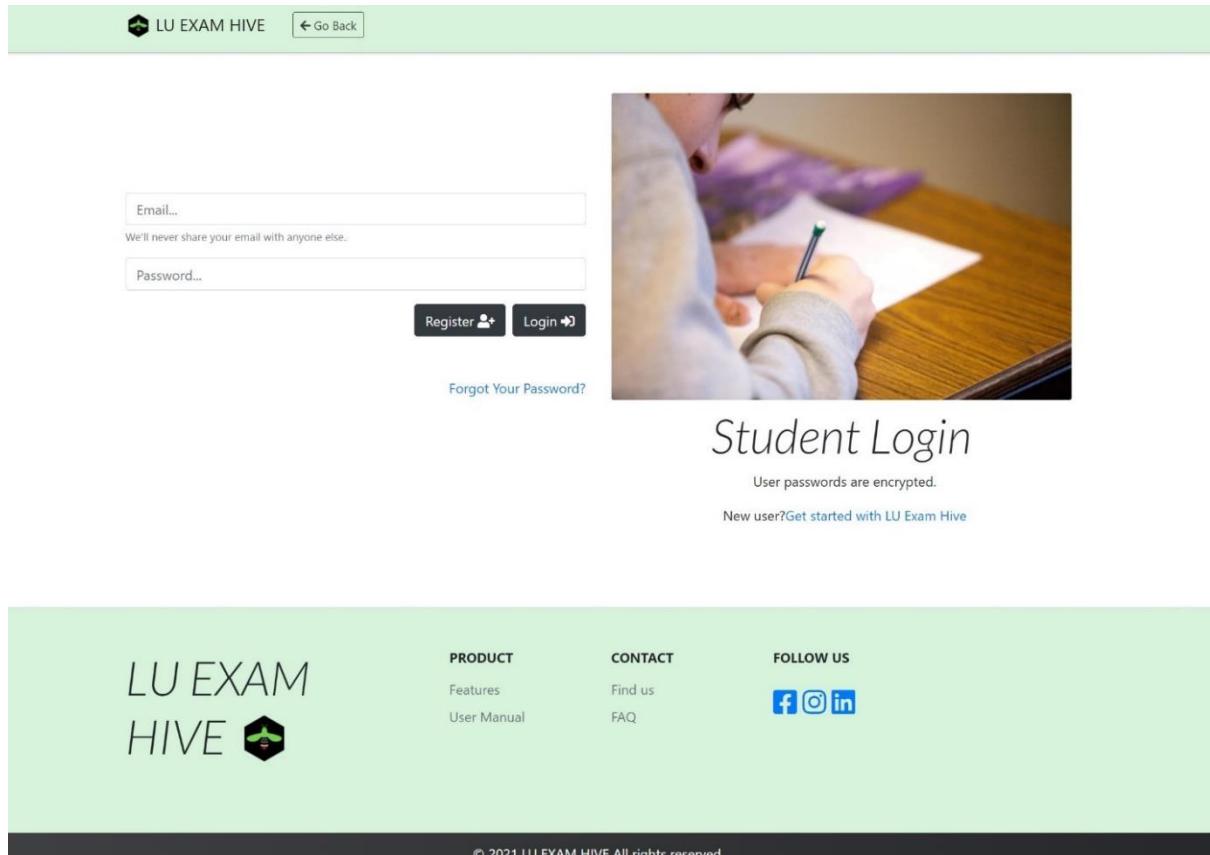


Figure 16: Student Login of LU Exam Hive

8.2.9 Login (Admin)

Admin login has to be approached via URL using a secret link.

The screenshot shows the Admin Login interface. At the top left is the LU EXAM HIVE logo. To its right is a 'Go Back' button. The main area is titled 'Admin Login' with a small icon above it. It contains two input fields: 'Email address' and 'Password', each with a corresponding input box below the label. A 'Log in' button is located at the bottom right of the form area. Below the login form is a footer section with the LU EXAM HIVE logo and social media links for Facebook, Instagram, and LinkedIn. The footer also includes a copyright notice: '© 2021 LU EXAM HIVE All rights reserved.'

Figure 17: Admin Login of LU Exam Hive

8.2.10 Registration (Student)

Students of the University will be requested to fill in this form in order to further navigate the pages of LU Exam Hive. After registration an OTP will be sent to user email address for verification.

The screenshot shows the 'Student Registration' page. At the top left is the LU EXAM HIVE logo and a 'Go Back' button. The main title 'Student Registration' is centered above a note: 'New Students may register using the form below. Already registered? Log in instead.' Below the note are six input fields: 'First Name' (empty), 'Last Name' (empty), 'Student Id' (empty), 'Email' (empty), 'Password' (empty), and 'Batch' and 'Section' (both empty). A 'Submit' button is at the bottom right. The footer contains the LU EXAM HIVE logo, links to 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (Facebook, Instagram, LinkedIn icons). A copyright notice at the bottom reads: '© 2021 LU EXAM HIVE All rights reserved.'

Figure 18: Student Registration Form of LU Exam Hive

8.2.11 Forgot Password (Student)

We often do forget our passwords thus not to worry, LU Exam Hive has you covered.

The screenshot shows a web page titled "Forgot Password?". At the top left is the LU EXAM HIVE logo with a small icon. To its right is a "Go Back" button. Below the title is a text input field with the placeholder "Email". Underneath the input field is a dark button labeled "Send reset link via email". A note below the input field states: "Note: If your email doesn't exist in our database, the data you will provide will not affect our database." At the bottom of the page, the LU EXAM HIVE logo is on the left, followed by navigation links for "PRODUCT" (Features, User Manual), "CONTACT" (Find us, FAQ), and "FOLLOW US" (Facebook, Instagram, LinkedIn). The footer contains the copyright notice: "© 2021 LU EXAM HIVE All rights reserved."

Figure 19: Forgot Password of LU Exam Hive

8.2.12 Email Template (Forget Password)

This is how the received email will look after requesting for a password reset via forget password page of LUEH. This is custom designed HTML email template, designed by LUEH team.

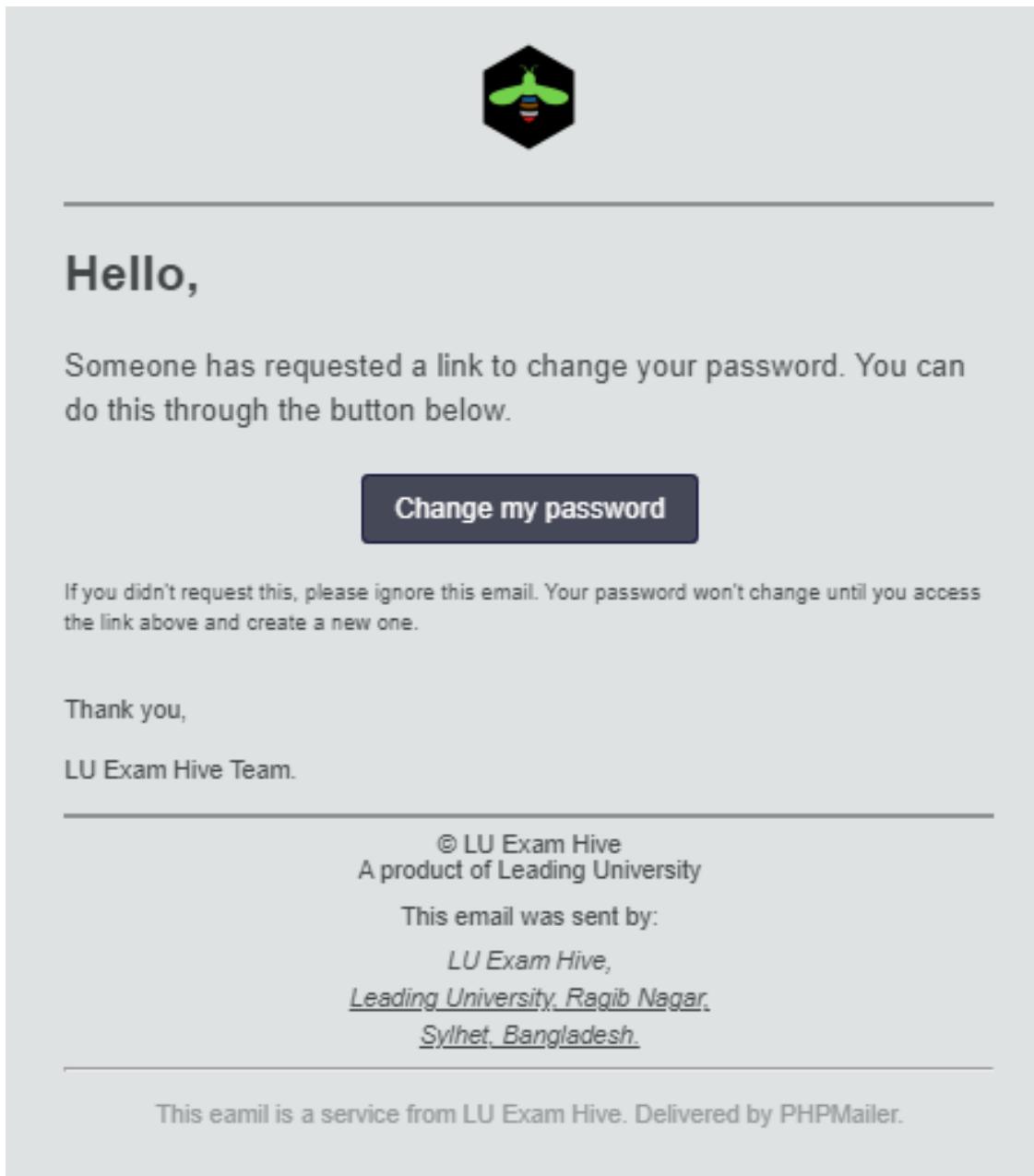


Figure 20: Email Template of LU Exam Hive

8.2.13 Dashboard (Teacher)

Keeping in mind that not all teachers are familiar to complex UI of a dashboard of online exam platforms, thus we designed easy to understand dashboard for easy navigation. Creating Meeting Links, Questions, Quiz, edit questions, deleting them Posting or keeping a Draft of Question for later post, seeing self-posted questions, viewing own questions and quiz, checking submitted solutions from students, marking them and then generating a pdf of the result sheet. Yes, we have it all under one platform.

The screenshot shows the LU Exam Hive Teacher Dashboard. At the top, there is a header bar with the LU EXAM HIVE logo on the left and a Logout button on the right. Below the header, the title "MHB Dashboard." is displayed. A row of buttons includes "Create Question", "Create a Quiz", "Get Meeting Link", and "Posted Questions". A message "Created questions are listed below." is followed by a table showing course details:

Course Name	Batch	Course Code	Status	Modify
Computer Basic	50 (A)	CSE - 1010	Posted	<input checked="" type="checkbox"/> / <input type="button" value="Edit"/>
Introduction to Computer	44 (B)	CSE - 1111	Draft	<input checked="" type="checkbox"/> / <input type="button" value="Edit"/>
Introduction to Computer	44 (C)	CSE - 1111	Done	<input checked="" type="checkbox"/> / <input type="button" value="Edit"/>

At the bottom, there are two buttons: "Quiz Questions" and "Meeting Links". The footer contains the LU EXAM HIVE logo, links to "PRODUCT" (Features, User Manual), "CONTACT" (Find us, FAQ), and "FOLLOW US" (Facebook, Instagram, LinkedIn icons). The footer also includes a copyright notice: "© 2021 LU EXAM HIVE All rights reserved."

Figure 21: Teacher Dashboard of LU Exam Hive

8.2.14 Create Question (Teacher)

In this area teachers will fill in the details of a section whose exam or assignment is to be conducted. It is to be kept in mind that Summernote is integrated to the Question making section of the website. (Summernote is a JavaScript library that helps you create WYSIWYG editors online. Summernote is built on jQuery.) Thus, Teachers can attach any pictures easily to the questions and do much more.

Create Question

Fill all the fields below to create a Question Paper !!

Course Code:

Course Name:

Batch:

Section:

Title:

Action:

Question Paper

#All question with proper spacing must go here. (You can stretch bottom to increase paper length.)

Figure 22: Create Question of LU Exam Hive

8.2.15 Create Quiz (Teacher)

8.2.15.1 Quiz Info

In order to generate a quiz, teacher has to fill the first page with the quiz information before going to the next page.

The screenshot shows the 'Quiz Info' page of the LU Exam Hive application. At the top, there is a header bar with the LU EXAM HIVE logo and a 'Go Back' button. Below the header is a blue title bar with the text 'Quiz Info'. A sub-instruction 'Fill the form below with question informations.' is displayed above the input fields. There are five input fields for course details: 'Course Code', 'Course Name', 'Batch', 'Section', and 'Title', each with its own text input box. At the bottom of the form is a 'Save & Proceed' button. The footer of the page features the LU EXAM HIVE logo, navigation links for 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (links to Facebook, Instagram, and LinkedIn). The footer also includes a copyright notice: '© 2021 LU EXAM HIVE All rights reserved.'

Figure 23: Quiz Info of LU Exam Hive

8.2.15.2 Insert Quiz Question

After saving the quiz questions info teacher user will be redirected to this page where they can add the quiz question with multiple choice option. To create another quiz question teacher can press the next button and after when done creating the last quiz question, teacher user can press the exit button.

The screenshot shows a web-based application titled "Insert Quiz Question". At the top left is the logo "LU EXAM HIVE" and a "Go Back" button. The main title "Insert Quiz Question" is centered at the top. Below it is a note: "Insert quiz question below, click 'Next' to insert another or if done click 'Exit'. Please remember to put the right 'Question Number' to avoid any conflict in database." The form consists of several input fields: "Question Number" (a text input field), "Question:" (a large text area), "Choice 1:", "Choice 2:", and "Choice 3:" (each with a text input field), and "Answer:" (a text input field). A green "Next >" button is located below the answer field. At the bottom, a note says "Note: Choices and answer will be shuffled on students end. When you are done creating all questions click the exit button below." A blue "Exit" button is positioned at the bottom center.

Figure 24: Insert Quiz Question of LU Exam Hive

8.2.16 Create Meeting (Teacher)

LU Exam Hive integrates the 2 most popular meeting apps Google meet and Zoom into the website so teachers have all the necessities sorted in under one platform. Teachers on clicking any of 2 meeting buttons will be taken to the following sites to schedule a date for meeting and the link obtained will be copied by the teachers and pasted into our Meeting Link input field. On save teachers will get their meeting links organized in their dashboard.

The screenshot shows a 'Create Meeting' form with the following fields:

- Course Code:** An input field.
- Course Name:** An input field.
- Batch:** An input field.
- Section:** An input field.
- Title:** An input field.
- Meeting Link:** An input field.

At the bottom, there are two buttons: **Get Meet Link** (with a Google Meet icon) and **Get Zoom Link** (with a Zoom icon). Between them is a double-headed arrow icon. Below these buttons is a **Save** button.

Figure 25: Create Meeting of Lu Exam Hive

8.2.17 Edit Question (Teacher)

Here teachers will be able to edit their questions after making them. If teachers didn't choose any Action before or kept it to be Draft or Post and want to change it to something else can be performed here.

Edit Question

Fill the fields below to create question !!!

Course Code:
CSE-4315

Course Name:
Computer security and Cryptography

Batch:
44

Section:
B

Title:
ASSIGNMENT on Symmetric Ciphers

Action:
--Choose--

Question Paper

ASSIGNMENT on Symmetric Ciphers

1. Using Vignere Cipher Encrypt the word "YOUR FULL NAME" using key "END" (Assume that you are not given any Vignere table). You must Show Decryption Process also.
2. Suppose you are given a key "HOSSAIN". Now encrypt the word "YOUR FULL NAME" using Playfair Cipher algorithm.
3. Encrypt the message "MEET ME" using the hill Cipher where key is "QUICKNESS". You must Show Decryption Process also
4. Write Differences between following Ciphers:

Hill Cipher	<u>Playfair</u> Cipher
<u>Polyalphabetic</u> Substitution Cipher	<u>Polygram</u> Substitution Cipher

Save

Figure 26: Edit Question of LU Exam Hive

8.2.18 Question View (Teacher)

Teachers after making a question can view how it will appear on screen for students in this section and can also check the solutions submitted by students by clicking the submissions and result button.

Question Information

Submissions and results 

Question Layout

Leading University
Department of CSE
Final Term Examination, Fall-2021
Course Title: Software Engineering
Course Code: CSE-3319
Batch: 44. Section: C

Leading University, Sylhet
Department of Computer Science & Engineering
Final Term Examination, Fall-2019

Course Title: Software Engineering	Course Code: CSE - 3319
Full Marks: 40	Time: 2:00Hours
Answer any 4 ($4 \times 10 = 40$) questions from the following. [Each question carries equal marks]	
1	a. What are the problems of requirement practices? Mention the task of requirement engineering. 6 b. State the tasks of Requirement Management. 4
2	a. Mention two types of requirement elicitation (information gathering) techniques and their advantages and disadvantages? 6 b. What are the activities in negotiation task of Requirement Engineering? 4
3	a. "System Y shall process a minimum of 8 transactions per second"-what type of requirement is it? What are the differences between functional and non-functional requirement. 6 b. "The system must be user friendly"—what is the problem in this requirement? How do you can rewrite this requirement correctly? 4
4	a. In a library system Library patron can search a book and reserve it for him/her. Then he/she needs to visit Library desk and check out by himself. If he/she does not find the book then he/she can request librarian to check the book in the system. Librarian also can insert the new record of the book and generate a catalog. 6 b. Based on this statement draw a use case and class diagram Using example 4(a) draw an activity diagram for library patron. 4
5	a. Apply GQM template for following example 6 <i>Improve the accuracy of software project managers' cost estimate at specification stage of a project within the X division of ABC company</i> b. Mention direct and indirect measure in terms of software engineering with example 4
6	a. What is measurement and measure? What are the key stages of formal measurement? 6 b. What is subjective and objective measure? Mention the name of different measurement scale with example. 4
7	a. What do you understand by length of code? Mention the benefits and challenges. 6 b. What are the attributes can be used to describe software size? 4

Figure 27: Question View of LU Exam Hive

8.2.19 Posts (Teacher & Student)

This section displays the current posts of every teachers. It is visible to both teachers and students.

The screenshot shows a web page titled "Available Questions". At the top, there is a navigation bar with a logo and the text "LU EXAM HIVE" and a "Go Back" button. Below the title, a sub-instruction reads: "Find the question according to your needs! Double check the course code and other necessary things before proceeding further". A table lists two posts:

Title	Course Code	Course Title	Batch (Sec)	Posted by
ASSIGNMENT on Symmetric Ciphers	CSE-4315	Computer security and Cryptography	44(B)	MHB
Final Term Examination, Fall-2021	CSE-3319	Software Engineering	44(C)	MHB

At the bottom of the page, there is a footer section with the "LU EXAM HIVE" logo, links to "PRODUCT" (Features, User Manual), "CONTACT" (Find us, FAQ), and "FOLLOW US" (Facebook, Instagram, LinkedIn) icons. A copyright notice at the very bottom states: "© 2021 LU EXAM HIVE All rights reserved."

Figure 28: Posts of LU Exam Hive

8.2.20 Submissions (Teacher)

All submitted solutions from students will appear here.

Submissions

Answer submissions for CSE-1213 | Computer Programming | Batch: 44(C) by MHB

[Generate Result in PDF Format](#)

Total Number of Submissions: 3

Student Id	Name	Batch (Sec)	Submission Time	Score
1712020101	Mohammed Zaman	44(C)	2021-03-04 22:42:00	5
1712020113	Towfiq Ahmed	44(C)	2021-03-04 22:42:08	1
1712020127	Mohi Uddin Pabel	44(C)	2021-03-04 22:42:18	4

Figure 29: Submissions of LU Exam Hive

8.2.21 PDF Generate (Teacher)

Teachers will be able to generate pdf of marks given to student submissions.

generate_result.php

1 / 1 | - 77% + ⌂ ⌃ ⌚

LU Exam Hive
Result Sheet
MCQ on Programming Language
Course Title: Computer Programming
Course Code: CSE-1213

Student ID	Name	Batch(Sec)	Course Code	Score
1712020101	Mohammed Zaman	44(C)	CSE-1213	5
1712020127	Mohi Uddin Pabel	44(C)	CSE-1213	4
1712020113	Towfiq Ahmed	44(C)	CSE-1213	1

Page 1/1

Figure 30: PDF Generate of LU Exam Hive

8.2.22 Submission Details (Teacher)

Teachers will be able to check solutions of students keeping questions in front of them and provide them a score.

Submission Details

Individual student submission details.

ASSIGNMENT on Symmetric Ciphers **Course Code:** CSE-4315 **Course Title:** Computer security and Cryptography

Name: Tawsif Ahmed Student ID: 1712020128 Batch (Sec): 44(B)
[See The Question](#)

ASSIGNMENT on Symmetric Ciphers

1. Using Vignere Cipher Encrypt the word "YOUR FULL NAME" using key "END" (Assume that you are not given any Vignere table). You must Show Decryption Process also.

2. Suppose you are given a key "HOSSAIN". Now encrypt the word "YOUR FULL NAME" using Playfair Cipher algorithm.

3. Encrypt the message "MEET ME" using the hill Cipher where key is "QUICKNESS". You must Show Decryption Process also

4. Write Differences between following Cyphers:

Hill Cipher	Playfair Cipher
Polyalphabetic Substitution Cipher	Polygram Substitution Cipher

Answer:

Ans No 1

Vigenere Cipher is a method of encrypting alphabetic text. It uses a simple form of polyalphabetic Substitution.

Give a Score or Update Current Score: [Save](#)

Figure 31: Submission Details of LU Exam Hive

8.2.23 Dashboard (Student)

We simplified student's dashboard keeping in mind not all students are used to complexity of online exam platforms. The table here generates only exams, quiz and meetings that is taking place within his/her section only and in case if a student wants to give exam with some other section can easily move to All Posted Questions where Exam details of all sections are present.

The screenshot shows the LU Exam Hive Student Dashboard. At the top, there is a green header bar with the logo 'LU EXAM HIVE' and a 'Logout' button. Below the header, the word 'Dashboard' is displayed in a large, stylized font. A sub-instruction below it says: 'Select a question from the table below and start the exam. Double check the course code and other necessary things before proceeding further.' A table follows, listing three items:

Title	Course Code	Course Title	Batch (Sec)	Posted by
Final Exam, Fall - 2019	CSE - 1111	Introduction to Computer	44(C)	MHB
Midterm Exam, Fall-2019	CSE - 4221	Computer Fundamentals	44(C)	AHQ
Midterm Exam, Fall-2019	CSE-3117	Computer Architecture & Design	44(C)	AHQ

Below the table are three buttons: 'All Posted Questions' (with a count of 13), 'Quiz Questions' (with a dropdown arrow), and 'Meeting Links' (with a dropdown arrow). A list of quizzes is shown in a box:

- Mid Quiz, Fall - 2019, 10 Marks. | Course Code: CSE -1111 | Batch: 44 (C) | MHB
- Computer Fundamentals Test Quiz | Course Code: CSE - 1232 | Batch: 44 (c) | AHQ
- Mid Quiz | Course Code: CSE - 3212 | Batch: 44 (C) | AHQ

At the bottom of the dashboard, a note says: 'Cannot find your question? Click the 'All Posted Question' on top to see a list of questions posted by all teachers.'

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Figure 32: Student Dashboard of LU Exam Hive

8.2.24 Answer Script (Student)

Students will answer in this section. They will have to attach their details before writing anything on the answer script. There is a digital clock integrated so they can keep tract of their time.

Answer Script

11:10:12 PM

Don't forget to **attach your details first** before handing over your answer script.

Name	Student ID
Batch	Section

Attach

Leading University
Department of CSE
ASSIGNMENT on Symmetric Ciphers
Course Title: Computer security and Cryptography
Course Code: CSE-4315
Batch:
Section:

ASSIGNMENT on Symmetric Ciphers

1. Using Vignere Cipher Encrypt the word "YOUR FULL NAME" using key "END" (Assume that you are not given any Vignere table). You must Show Decryption Process also.
2. Suppose you are given a key "HOSSAIN". Now encrypt the word "YOUR FULL NAME" using Playfair Cipher algorithm.
3. Encrypt the message "MEET ME" using the hill Cipher where key is "QUICKNESS". You must Show Decryption Process also
4. Write Differences between following Cyphers:

Hill Cipher	Playfair Cipher
Polyalphabetic Substitution Cipher	Polygram Substitution Cipher

#Your Answers will be written here :)

Submit

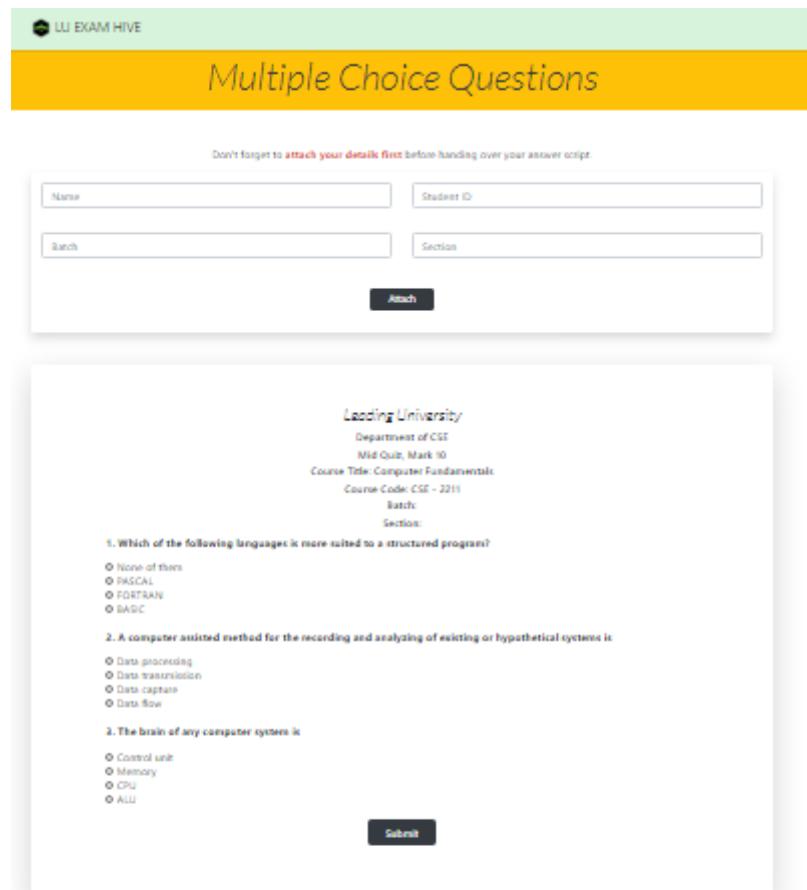
LU EXAM
HIVE 

If my future were determined just by my performance on a standardized test, I wouldn't be here. I guarantee you that.
— Michelle Obama

Figure 33: Answer Script of LU Exam Hive

8.2.25 Quiz Answer Script (Student)

This is the quiz answer script for student user. The multiple options will always be shuffled.



The screenshot shows the LU Exam Hive interface for a Multiple Choice Questions (MCQ) submission. At the top, there's a green header bar with the LU EXAM HIVE logo. Below it is a yellow bar with the title "Multiple Choice Questions". A message "Don't forget to attach your details first before handing over your answer script." is displayed. Below this are four input fields: Name, Student ID, Batch, and Section, each with a corresponding text input box. There is also an "Attach" button. The main content area contains the question and answer choices for the first three questions. Question 1 asks about suitable languages for structured programs, with options: None of them, PASCAL, FORTRAN, and BASIC. Question 2 asks about a computer-assisted method for recording and analyzing existing or hypothetical systems, with options: Data processing, Data transmission, Data capture, and Data flow. Question 3 asks what the brain of any computer system is, with options: Control unit, Memory, CPU, and All. At the bottom right of the content area is a "Submit" button.

Don't forget to attach your details first before handing over your answer script.

Name _____ Student ID _____

Batch _____ Section _____

Attach

Lauding University
Department of CSE
Mid Quiz, Mark 10
Course Title: Computer Fundamentals
Course Code: CSE - 2211
Batch: _____
Section: _____

1. Which of the following languages is more suited to a structured program?

None of them
 PASCAL
 FORTRAN
 BASIC

2. A computer assisted method for the recording and analyzing of existing or hypothetical systems is

Data processing
 Data transmission
 Data capture
 Data flow

3. The brain of any computer system is

Control unit
 Memory
 CPU
 All

Submit

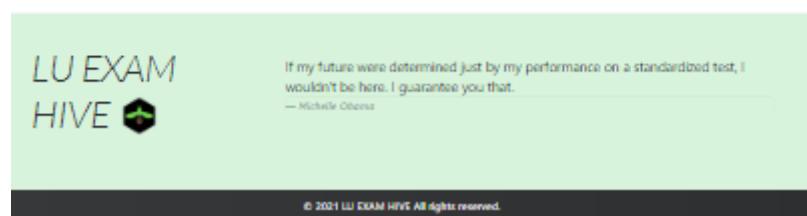


Figure 34: Quiz Answer Script of LU Exam Hive

8.2.26 Dashboard (Admin)

Designed with simplicity in mind. Admin has access to all the details of user in the platform and contacting users.

LU EXAM HIVE

Contact Info

View all the messages in the Contact Section.

See more

Teacher Info

View teachers information and Register new Teachers.

See more

Stucent Info

View Students information and identify unverified accounts.

See more

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Figure 35: Admin Dashboard of LU Exam Hive

8.2.27 Contact Info (Admin)

Here admins will have information of all the users contacting the website.

The screenshot shows a web application interface for managing user contacts. At the top, there is a header bar with the logo 'LU EXAM HIVE' and a 'Go Back' button. Below the header, the title 'Contact Info' is displayed. A table lists four contacts with columns for ID, Name, Email, Received At, and Action. The contacts are:

ID	Name	Email	Received At	Action
2	Joseph Ahmed	csev@umich.edu	2021-03-04 22:00:23	/
3	Raihan Chowdhury	raihan200@yahoo.com	2021-03-04 22:03:19	/
4	Kamal Mia	kamal@yahoo.com	2021-03-04 22:04:09	/

At the bottom of the page, there is a footer section with the LU EXAM HIVE logo, links to 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (Facebook, Instagram, LinkedIn) icons. A copyright notice at the very bottom states '© 2021 LU EXAM HIVE All rights reserved.'

Figure 36: Contact Info of LU Exam Hive

8.2.28 Contact Info Delete (Admin)

Admin can view the message of the contact and also delete it.

The screenshot shows a web application interface for managing contact information. At the top, there is a header bar with the logo 'LU EXAM HIVE' and a 'Go Back' button. Below the header, the title 'Contact Info' is displayed. The main content area contains the following details:

Name: Kamal Mia **ID:** 4
Email: kamal@yahoo.com
Received Date & Time: 2021-03-04 22:04:09
Message: I am from XYZ University can i use LU EXAM HIVE?

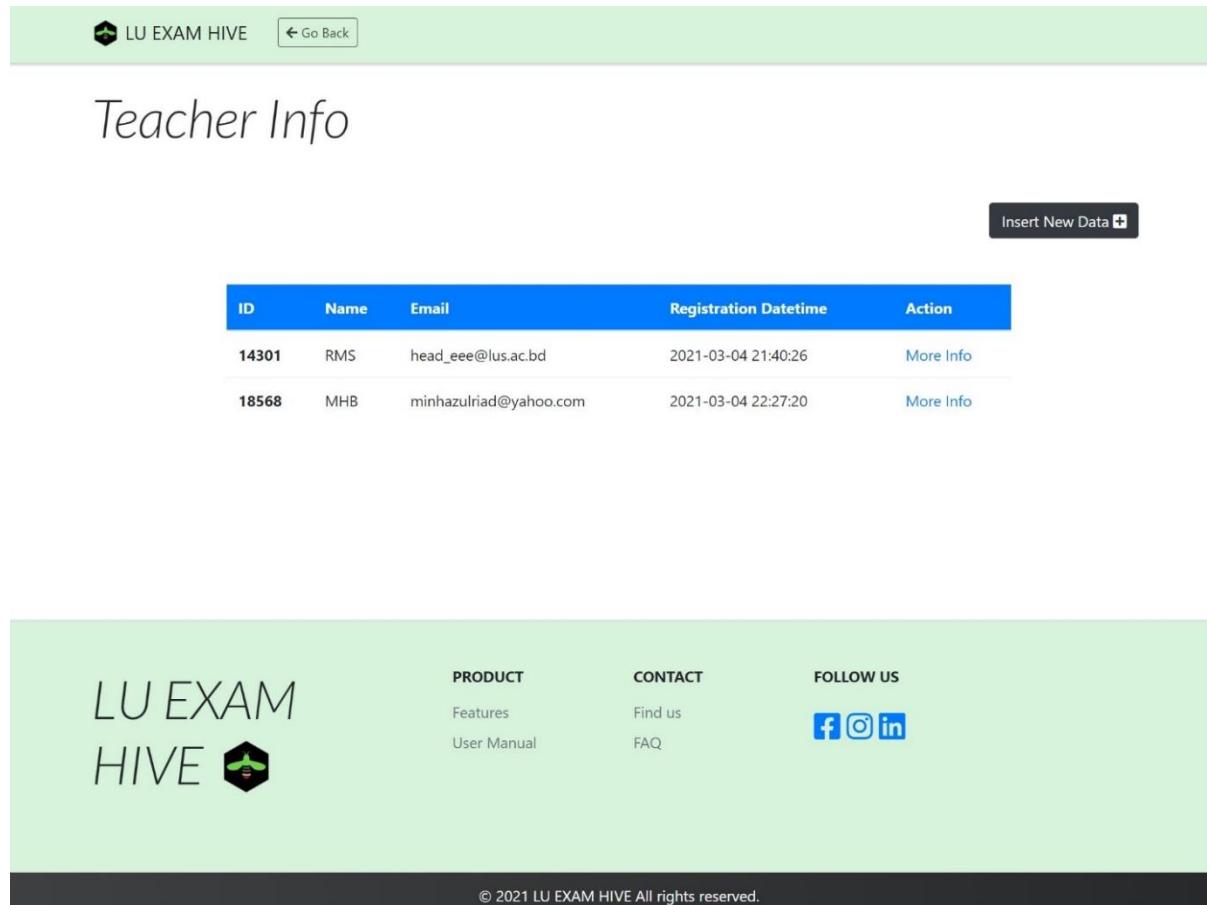
At the bottom right of the content area, there is a red rectangular button labeled 'Delete record'.

At the bottom of the page, there is a footer section with the 'LU EXAM HIVE' logo, navigation links for 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (links to Facebook, Instagram, and LinkedIn). A copyright notice at the bottom states: © 2021 LU EXAM HIVE All rights reserved.

Figure 37: Contact Info Delete of LU Exam Hive

8.2.29 Teacher Info (Admin)

Admin can view the teachers registered to the platform here and also go onto add new Teachers to the site.



ID	Name	Email	Registration Datetime	Action
14301	RMS	head_eee@lus.ac.bd	2021-03-04 21:40:26	More Info
18568	MHB	minhazulriad@yahoo.com	2021-03-04 22:27:20	More Info

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Figure 38: Teacher info of LU Exam Hive

8.2.30 Insert Teacher Info (Admin)

Admin will be able to add new teacher by filling up the following.

The screenshot shows a web page titled "Insert Teacher Info". At the top left is the LU EXAM HIVE logo and a "Go Back" button. The main form has four input fields: "Name" (a text input), "Teacher ID" (a text input), "Department" (a text input), and "Email" (a text input) next to a "Password" label. Below the form is a "Insert Into Database" button. At the bottom of the page is a footer with the LU EXAM HIVE logo, navigation links for "PRODUCT" (Features, User Manual), "CONTACT" (Find us, FAQ), and "FOLLOW US" (links to Facebook, Instagram, and LinkedIn). The footer also includes a copyright notice: "© 2021 LU EXAM HIVE All rights reserved."

Figure 39: Insert Teacher Info of LU Exam Hive

8.2.31 Student Info (Admin)

Admin will get a batch wise student details (includes number of student present in each batch) and also search for a specific student id and acquire all information easily.

The screenshot shows the 'Student Info' section of the LU Exam Hive website. At the top, there is a navigation bar with a logo, 'LU EXAM HIVE', and a 'Go Back' button. Below this is a search bar with a placeholder '1712020127' and a 'Search' button. A link '1712020101 - Mohammed Zaman (More details)' is shown below the search bar. A green header bar says 'Sort Student List by Batch'. Below it, four rows show student counts for different batches: Batch 44 (Total 4), Batch 45 (Total 1), Batch 50 (Total 1), and Batch 52 (Total 1). The footer contains the LU EXAM HIVE logo, links to 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (Facebook, Instagram, LinkedIn) icons. A copyright notice at the bottom states '© 2021 LU EXAM HIVE All rights reserved.'

Figure 40: Student Info of LU Exam Hive

8.2.32 Unverified Email List (Admin)

Admin can easily detect which users are still unverified and can take actions.

The screenshot shows a web application interface for managing student email verification. At the top, there is a header bar with the LU EXAM HIVE logo and a 'Go Back' button. Below the header, the title 'Unverified Email List' is displayed in a large, stylized font. A descriptive message follows: 'A list of students who haven't verified their email. Students will not get access to the website until they are verified.' A table then lists two students who have not verified their emails:

Student_ID	Name	Email	Batch	Status	Action
2012020001	Sabbi Ahmed	sabbi@yahoo.com	52	not verified	More info
2112020111	Rashid Chowdhury	rashid@yahoo.com	50	not verified	More info

At the bottom of the page, there is a footer section with the LU EXAM HIVE logo, links to 'PRODUCT' (Features, User Manual), 'CONTACT' (Find us, FAQ), and 'FOLLOW US' (Facebook, Instagram, LinkedIn icons). A copyright notice at the very bottom states: '© 2021 LU EXAM HIVE All rights reserved.'

Figure 41: Unverified email list of LU Exam Hive

8.2.33 Student Details (Admin)

Admin has the power to view details of a student's LU Exam Hive account and also delete their account.

The screenshot shows a web page titled "Student Details". At the top left is the LU EXAM HIVE logo and a "Go Back" button. The main content area displays the following student information:

Name: Sabbi Ahmed
Profile ID: 8
Student ID: 2012020001
Batch: 52
Section: F
Email: sabbi@yahoo.com
Email Status: not verified
OTP: 5111211
Activation Code: q42ad5e83a349b3b675c709b9ed2958b
Registration Date & Time: 2021-03-04 22:23:27

At the bottom right of the content area is a red rectangular button labeled "Delete record".

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Figure 42: Student Details of LU Exam Hive

8.2.34 Student Info by Batch (Admin)

Admins are given further ease to look into a particular batch and its sub sections.

 LU EXAM HIVE ← Go Back

Student Info by Batch

Sort by Section

Sec: B Sec: C

Student Id	Name	Section	Batch	Email	Status	Action
1712020101	Mohammed Zaman	C	44	jgreen42@yahoo.com	verified	More info
1712020113	Towfiq Ahmed	C	44	tat@yahoo.com	verified	More info
1712020127	Mohi Uddin Pabel	C	44	pabel@yahoo.com	verified	More info
1712020128	Tawsif Ahmed	B	44	tawsif@yahoo.com	verified	More info

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Figure 43: Student Info by Batch of LU Exam Hive

8.2.35 Student Info by Section (Admin)

Admin can further view individual section and the number of students registered under them and more details on them.

LU EXAM HIVE

Go Back

Student Info by Section

Section: C
Total Number of Registered Students: 3

Student Id	Name	Section	Batch	Email	Status	Action
1712020101	Mohammed Zaman	C	44	jgreen42@yahoo.com	verified	More info
1712020113	Towfiq Ahmed	C	44	tat@yahoo.com	verified	More info
1712020127	Mohi Uddin Pabel	C	44	pabel@yahoo.com	verified	More info

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Figure 44: Student Info by Section of LU Exam Hive

8.2.36 LU Exam Hive (Logo)

The logo below is the Symbol of LU Exam Hive Online Examination System. LU Exam Hive has been created for Leading University Students Only. Leading University community has 4 distinct groups i.e., Teacher, Student, Administration and Staff. Here green resembles student, blue denote teacher, red points to the administration and the black is for the staff in transportation, and brown denotes the soil that holds all of us together in place, we all are connected to the same soil even though we have distinct roles in society. The colors are picked according to the ID card color used within our university premises. A student on his/her own can hardly succeed in life but together with proper guidance from professional teachers and well-organized institution can reach the peak sooner then he/she expected. Such is the moto of the symbol below.



Figure 45: LU Exam Hive Logo

Chapter – 9

Implementation

There are several functionalities on our website. To demonstrate, some of the code implementations are given below:

9.1 Login-Logout Functionalities

Login and Logout are restricted to the particular user

- Admin Login-Logout

```
81 |     <form method="POST" action="admin_login.php">
82 |       <div class="form-group">
83 |         <label for="exampleInputEmail1">Email address</label>
84 |         <input type="email" name="Admin_Email" class="form-control" id="exampleInputEmail1"
85 |           aria-describedby="emailHelp">
86 |       </div>
87 |       <div class="form-group">
88 |         <label for="exampleInputPassword1">Password</label>
89 |         <input type="password" name="Password" class="form-control" id="exampleInputPassword1">
90 |       </div>
91 |       <div class="d-flex justify-content-end">
92 |         <input type="submit" class="btn btn-dark" name="login" value="Log in">
93 |       </div>
94 |     </form>
95 |
96 |     <?php
97 |     session_start();
98 |     session_destroy();
99 |     unset($_SESSION['Admin_ID']);
100 |    header("location:admin_login.php");
101 |  
```

- Teacher Login-Logout

```
87 |     <form method="POST" action="teacher_Login.php">
88 |       <div class="form-group " >
89 |         <input type="email" name="Teacher_Email" class="form-control "
90 |           id="exampleInputEmail1" aria-describedby="emailHelp" placeholder="Email...">
91 |           <small id="emailHelp" class="form-text text-muted">We'll never share your email
92 |             with anyone
93 |             else.</small>
94 |       </div>
95 |       <div class="form-group">
96 |         <input type="password" name="pass" class="form-control"
97 |           id="exampleInputPassword1" placeholder="Password...">
98 |       </div>
99 |       <div class="d-flex justify-content-end">
100 |         <button type="submit" name="login" class="btn btn-dark ml-1">Login <i class="fas
101 |           fa-sign-in-alt"></i></button>
102 |       </div>
103 |     </form>
104 |
105 |     <?php
106 |     session_start();
107 |     session_destroy();
108 |     unset($_SESSION['Teacher_ID']);
109 |     unset($_SESSION['Name']);
110 |     header("location:teacher_Login.php");
111 |   
```

- Student Login-Logout

```

91 |         <form method="POST" action="student_login.php">
92 |             <div class="form-group ">
93 |                 <input type="email" name="Student_Email" class="form-control "
94 |                     id="exampleInputEmail1" aria-describedby="emailHelp" placeholder="Email...">
95 |                     <small id="emailHelp" class="form-text text-muted">We'll never share your email
96 |                         with anyone
97 |                         else.</small>
98 |             </div>
99 |             <div class="form-group">
100 |                 <input type="password" name="Password" class="form-control"
101 |                     id="exampleInputPassword1" placeholder="Password...">
102 |             </div>
103 |             <div class="d-flex justify-content-end">
104 |                 <button type="submit" class="btn btn-dark"><a class="text-white
text-decoration-none" href="student_Registration.php">Register <i class="fas
fa-user-plus"></i></a></button>
<button type="submit" name="login" class="btn btn-dark ml-2">Login <i class="fas
fa-sign-in-alt"></i></button>
             </div>
1
<?php
2 session_start();
3 session_destroy();
4 unset($_SESSION['Student_ID']);
5 unset($_SESSION['Batch']);
6 unset($_SESSION['Section']);
7 header("location:student_login.php");
8

```

9.2 Student Registration Functionalities

- Student Registration

```

110 //Check if email unique or not.
111 if ($pdo->lastInsertId() == 0) { //lastInsertId() returns last inserted id.
112
113     $message = '<label class="text-danger">This Student ID is Already Registered.</label>';
114 } else {
115     require 'assets/phpmailer/class.phpmailer.php';
116     require 'assets/phpmailer/class.smtp.php';
117     $mail = new PHPMailer;
118
119     $mail->SMTPDebug = 3; // Enable verbose debug output
120     $mail->isSMTP(); // Set mailer to use SMTP
121     $mail->Host = 'smtp.gmail.com'; // Specify main and backup SMTP servers
122     $mail->SMTPAuth = true; // Enable SMTP authentication
123     $mail->Username = 'luexamhive@gmail.com'; // SMTP username
124     $mail->Password = 'examhive44'; // SMTP password
125     $mail->SMTPSecure = 'tls'; // Enable TLS encryption, `ssl` also accepted
126     $mail->Port = 587; // TCP port to connect to
127
128     $mail->setFrom('luexamhive@gmail.com', 'LU EXAM HIVE');
129     $mail->addAddress($_POST['Student_Email']); // Add a recipient
130     $mail->isHTML(true); // Set email format to HTML
131     $mail->Subject = 'LU EXAM HIVE Email Verification Code.';
132     $message_body =
133         '<p>For verifying your email address, enter the provided verification code: <b>' . $Student_Otp . '</b>.
</p>
<p>Sincerely,</p>
<p>LU Authority.</p>
';

```

- OTP

```

9   //If url consists of code key.
10 if (isset($_GET["code"])) {
11     $Student_Activation_Code = $_GET["code"];
12     $_SESSION['code'] = $Student_Activation_Code;
13 }
14 if (isset($_POST["check"])) {
15     if (empty($_POST["Student_Otp"])) {
16         $error_Student_Otp = 'Enter OTP Number';
17     } else {
18         $query = "
19             SELECT * FROM student
20             WHERE Student_Activation_Code = '" . $_SESSION['code'] . "'"
21             AND Student_Otp = '" . trim($_POST["Student_Otp"]) . "'"
22             ";
23         $statement = $pdo->prepare($query); //Make query for execution.
24         $statement->execute(); //Will execute above query.
25         $total_row = $statement->rowCount();
26         if ($total_row > 0) {
27             $query = "
28                 UPDATE student
29                 SET Student_Email_Status = 'verified'
30                 WHERE Student_Activation_Code = '" . $_SESSION['code'] . "'"
31                 ";
32             $statement = $pdo->prepare($query);
33             if ($statement->execute()) {
34                 $_SESSION['registered'] = 'Your Registration is Complete. You may login in!';
35                 header('location:student_login.php');
36             }
37         } else {
38             $message = '<label class="alert alert-danger">Invalid OTP Number</label>';
39         }

```

- Reset password

```

31     //Server settings
32     $mail->isSMTP();                                     // Send using SMTP
33     $mail->Host      = 'smtp.gmail.com';                // Set the SMTP server to send through
34     $mail->SMTPAuth  = true;                            // Enable SMTP authentication
35     $mail->Username   = 'luexamhive@gmail.com';          // SMTP username
36     $mail->Password   = 'examhive44';                   // SMTP password
37     $mail->SMTPSecure = PHPMailer::ENCRYPTION_STARTTLS; // Enable TLS encryption;
38     `PHPMailer::ENCRYPTION_SMTPS` encouraged           // TCP port to connect to, use 465 for
39     $mail->Port       = 587;                             // SMTP port number for the GMAIL server
40     `PHPMailer::ENCRYPTION_SMTPS` above
41
42     //Recipients
43     $mail->setFrom('luexamhive@gmail.com', 'LU Exam Hive');
44     $mail->addAddress($emailTo); // Add a recipient
45     $mail->addReplyTo('no-reply@mail.com', 'No reply');
46
47     // Content
48     $url = "http://" . $_SERVER["HTTP_HOST"] . dirname($_SERVER["PHP_SELF"]) . "/reset_password.php?
49     code=$code";
50     $mail->isHTML(true);                                // Set email format to HTML
51     $mail->Subject = 'Reset password instructions';
52     $mail->Body   = "<body style='color: #424647; font-size: 16px; text-decoration: none; font-family: Helvetica, Arial, sans-serif; background-color: #dee2e3;'>
```

- Request Reset Password

```

13 // getting the email from resetPasswords table by checking if it has a row that contains the code
14 $sqlEmail = "SELECT email FROM Reset_Password WHERE code='$code'";
15 $stmt = $pdo->prepare($sqlEmail);
16 $stmt = $pdo->query($sqlEmail);
17 |
18
19 // getting the password from input field
20 if (isset($_POST["password"])) {
21     $salt = '8JDs,-w^q;-57Jc,ZP:g[=8[r+=FC';
22     $Password = md5($salt . $_POST['password']);
23
24     //fething to get the email from resetPasswords table
25     $row = $stmt->fetch();
26     $email = $row["email"] ??= 'default value';
27
28     // updating the password in the main table where the email matches with the fetched email
29     $sql = "UPDATE Student SET Password='$Password' WHERE Student_Email='$email'";
30     $stmt = $pdo->prepare($sql);
31     $stmt = $pdo->query($sql);
32
33     // deleting the record from resetPasswords table once the password is changed
34     if ($stmt) {
35         $sql = "DELETE FROM Reset_Password WHERE code='$code'";
36         $stmt = $pdo->prepare($sql);
37         $stmt = $pdo->query($sql);
38         $Updated = "Password updated! Go back to";
39         $log_in = "log in page.";
40     } else {
41         exit("Something went wrong");
42     }

```

9.3 Teacher Dashboard

- Create Question

```

106 <div class="container">
107   <div class="col">
108     <textarea class="form-control m-input" id="summernote" name="Content" required></textarea>
109     <script>
110       $('#summernote').summernote({
111         placeholder: '#All question with proper spacing must go here. (You can stretch bottom
112         to increase paper length.)',
113         tabsize: 2,
114         height: 500
115       });
116     </script>
117   </div>

```

- Create Meeting

```

118 <div class="form-group d-flex justify-content-center">
119   <div class="col-sm-4 col-sm-offset-2 p-1">
120     <a href="https://calendar.google.com/calendar/u/0/r/day" target="_blank" class="btn
121       btn-dark btn-block text-white text-decoration-none">Get Meet Link
122     </a>
123   </div>
124   <div class="form-group d-flex justify-content-center">
125     <div class="col mt-3">
126       <i class="fas fa-exchange-alt"></i>
127     </div>
128   </div>
129   <div class="col-sm-4 col-sm-offset-2 p-1">
130     <a href="https://zoom.us/meeting/schedule" target="_blank" class="btn btn-dark
131       btn-block text-white text-decoration-none">Get Zoom Link
132     </a>

```

- **Posted Question**

```

45     <div class="col-xl-11 col-lg-11 col-md-10 col-sm-9 col-xs-6 my-5 table-responsive-sm">
46         <table class="table table-hover">
47             <thead>
48                 <tr class='bg-dark text-white'>
49                     <th scope="col">Title</th>
50                     <th scope="col">Course Code</th>
51                     <th scope="col">Course Title</th>
52                     <th scope="col">Batch (Sec)</th>
53                     <th scope="col">Posted by</th>
54                 </tr>
55             </thead>
56             <tbody>
57                 <?php foreach ($infos as $info) { ?>
58
59                     <tr onclick="window.location='answer_script.php?id=<?php echo $info['Question_Description_ID'] ; ?>&title=<?php echo $info['Title']; ?>&ct=<?php echo $info['Course_Name']; ?>&cc=<?php echo $info['Course_Code']; ?>&batch=<?php echo $info['Batch']; ?>&sec=<?php echo $info['Section']; ?>'>;
60                         <td><?php echo htmlspecialchars($info['Title']); ?></td>
61                         <td><?php echo htmlspecialchars($info['Course_Code']); ?></td>
62                         <td><?php echo htmlspecialchars($info['Course_Name']); ?></td>
63                         <td><?php echo htmlspecialchars($info['Batch']); ?><?php echo htmlspecialchars($info ['Section']); ?></td>
64                         <td><?php echo htmlspecialchars($info['Name']); ?></td>
65                     </tr>
66
67                 </?php } ?>
68
69             </tbody>
70         </table>
71     </div>

```

- **Question View**

```

99     <div class="row">
100         <div class="col">
101             <p class="px-xs-0 px-sm-0 px-md-3 px-lg-5 px-xl-5 mx-xs-1 mx-sm-1 mx-md-3 mx-lg-5 mx-xl-5 mb-5">
102                 <?php echo $info['Content']; ?>
103                 <br><br>
104
105             </p>
106         </div>
107     </div>

```

- **Question Submissions**

```

96     <tbody>
97
98         <?php foreach ($infos as $info) {?>
99
100             <tr class="text-primary" onclick="window.location='question_submission_detail.php?Question_Description_ID=<?php echo htmlspecialchars($info ['Question_Description_ID']); ?>&Student_Id=<?php echo htmlspecialchars($info ['Student_ID']); ?>'>;
101                 <th scope="row"><?php echo htmlspecialchars($info['Student_ID']); ?></th>
102                 <td><?php echo htmlspecialchars($info['Full_Name']); ?></td>
103                 <td><?php echo htmlspecialchars($info['Batch']); ?><?php echo htmlspecialchars($info['Section']); ?></td>
104                 <td><?php echo htmlspecialchars($info['Submission_Datetime']); ?></td>
105
106                 <td><span class="<?php if ($info['Score'] != null) {
107                     $status = 'text-success';
108                 } else {
109                     $status = 'text-danger';
110                 }
111                 echo $status?>">
112                     <?php if ($info['Score'] == null) {
113                         echo "Not given";
114                     }
115                     echo htmlspecialchars($info['Score']);?></span></td>
116                     </tr>
117
118                 <?php }?>
119             </tbody>

```

- **Generate Result**

```

17     function questionInfo($pdo)
18     {
19         $q_id = $_GET['Question_Description_ID'];
20         $sql = $pdo->prepare("SELECT question_description.Question_Description_ID, question_description.
21             Teacher_ID, question_description.Course_Code, question_description.Batch ,question_description.Section,
22             question_description.Course_Name, question_description.Title, teacher.Name FROM question_description
23             INNER JOIN teacher ON question_description.Teacher_ID = teacher.Teacher_ID WHERE Question_Description_ID
24             = $q_id");
25         $sql->setFetchMode(PDO::FETCH_OBJ);
26         $sql->execute();
27         $row = $sql->fetch();
28
29         $this->SetFont('Times', '', 12);
30         $this->Cell(276, 5, $row->Title, 0, 0, 'C');
31         $this->Ln();
32         $this->Cell(276, 5, "Course Title: " . $row->Course_Name, 0, 0, 'C');
33         $this->Ln();
34         $this->Cell(276, 5, "Course Code: " . $row->Course_Code, 0, 0, 'C');
35         $this->Ln(20);
36     }

```

- **Submission Details**

```

23 //putting score in database
24 if (isset($_POST['submit'])) {
25     $score = $_POST['score'];
26     try {
27         require_once "assets/connect/pdo.php";
28         $pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
29         $sql = "UPDATE student_answer SET Score = '$score' WHERE Student_ID = '$student_id' AND
30             Question_Description_ID = '$question_id'";
31         // use exec() because no results are returned
32         $pdo->exec($sql);
33         $success = "<label class='alert alert-success'>Score has been updated!&nbsp;
34         <button type='button' class='close' data-dismiss='alert' aria-label='Close'>
35             <span aria-hidden='true'>&times;</span>
36         </button></label>";
37     } catch (PDOException $e) {
38         $err = $e->getMessage();
39         echo "Data insertion failed. Please try again. $err";
40     }
41     $question_id = $_SESSION['question_id'];
42     sleep(1);
43     header("Location: question_submission.php?Question_Description_ID=$question_id");
44 }

```

- **Edit question**

```

133     <div class="container-fluid">
134         <textarea required class="form-control m-input" id="summernote" name="Content"><?php echo
135             $row['Content'] ?></textarea>
136         <script>
137             $('#summernote').summernote({
138                 placeholder: '#All question with proper spacing must go here. (You can stretch
139                 bottom to increase paper length.)',
140                 tabsize: 2,
141                 height: 500
142             });
143         </div>

```

- **Delete Question**

```

12 if (isset($_POST['Delete']) && isset($_POST['Question_Description_ID'])) {
13
14     try {
15         $sql = "DELETE FROM question_description WHERE Question_Description_ID = :zip";
16         $stmt = $pdo->prepare($sql);
17         $stmt->execute(array(':zip' => $_POST['Question_Description_ID']));
18
19         $_SESSION['success'] = 'Record deleted';
20         header('Location: teacher_dashboard.php');
21         return;
22     } catch (PDOException $e) {
23         $error = "<label class='alert alert-danger>Cannot delete this question. Please publish the result and
change status to <b>Done</b>. Contact with the System Administrator for question deletion. <a
href='teacher_dashboard.php'>Go Back?</a></label>";
24     }
25 }
26 // Guardian: Make sure that user_id is present
27 if (!isset($_GET['Question_Description_ID'])) {
28     $_SESSION['error'] = "Missing user_id";
29     header('Location: teacher_dashboard.php');
30     return;
31 }
32 $stmt = $pdo->prepare("SELECT Course_Code, Course_Name, Batch, Section FROM question_description where
Question_Description_ID = :xyz");
33 $stmt->execute(array(":xyz" => $_GET['Question_Description_ID']));
34 $row = $stmt->fetch(PDO::FETCH_ASSOC);
35 if ($row === false) {
36     $_SESSION['error'] = 'Bad value for Question Description ID';
37     header('Location: teacher_dashboard.php');
38     return;
39 }

```

9.4 Student Dashboard

- **Dashboard**

```

73
74     <table class="table table-hover">
75         <thead class="bg-success text-white">
76             <tr>
77                 <th scope="col">Title</th>
78                 <th scope="col">Course Code</th>
79                 <th scope="col">Course Title</th>
80                 <th scope="col">Batch (Sec)</th>
81                 <th scope="col">Posted by</th>
82             </tr>
83         </thead>
84         <tbody>
85
86             <?php foreach ($infos as $info) { ?>
87
88                 <tr onclick="window.location='answer_script.php?id=<?php echo $info
['Question_Description_ID']; ?>&title=<?php echo $info['Title']; ?>&ct=<?php
echo $info['Course_Name']; ?>&c=<?php echo $info['Course_Code']; ?>&batch=<?
php echo $info['Batch']; ?>&sec=<?php echo $info['Section']; ?>'>">
89                     <td><?php echo htmlspecialchars($info['Title']); ?></td>
90                     <td><?php echo htmlspecialchars($info['Course_Code']); ?></td>
91                     <td><?php echo htmlspecialchars($info['Course_Name']); ?></td>
92                     <td><?php echo htmlspecialchars($info['Batch']); ?>(<?php echo
htmlspecialchars($info['Section']); ?>)</td>
93                     <td><?php echo htmlspecialchars($info['Name']); ?></td>
94
95                 </tr>
96
97             <?php } ?>
98         </tbody>

```

```

106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
    <div class="col-xl-11 col-lg-11 col-md-10 col-sm-9 col-xs-6 my-3 my-5">
      <p>
        <button class="btn btn-dark mb-1" type="button" data-toggle="collapse"
          data-target="#collapseExample" aria-expanded="false" aria-controls="collapseExample">
          Meeting Links &nbsp;<i class="fas fa-chevron-circle-down"></i>
        </button>
        <a class="btn btn-dark mb-1" href="posts.php" role="button">All Posted Questions <svg
          class="mb-1" xmlns="http://www.w3.org/2000/svg" width="16" height="16"
          fill="currentColor" class="bi bi-mailbox2" viewBox="0 0 16 16">
            <path d="M9 8.5h2.793l.853.854A.5.5 0 0 0 13 9.5h1a.5.5 0 0 0 -.5-.5V8a.5.5 0
              0 0-.5-.5H9v1z" />
            <path d="M12 3H4a4 4 0 0 0-4v6a1 1 0 0 1 1h14a1 1 0 0 0 1-1V7a4 4 0 0
              0-4-4zM8 7a3.99 3.99 0 0 0-1.354-3H12a3 3 0 0 1 3 3v6H8V7zm-3.415.157C4.42 7.
              087 4.218 7 4 7c-.218 0-.42.086-.585.157C3.164 7.264 3 7.334 3 7a1 1 0 0 1 2
              0c0 .334-.164.264-.415.157z" />
          </svg></a>
      </p>
      <div class="collapse" id="collapseExample">
        <div class="card card-body bg-dark">
          <ul class="list-group">
            <?php foreach ($rows as $row) { ?>
              <li class="list-group-item"><a href=<?php echo $row['Meeting_Link']; ?>">
                <?php echo $row['Title']; ?>&nbsp;<i class="fas fa-chalkboard-teacher"></i>&nbsp;<?php echo $row['Name']; ?></a></li>
              <?php } ?>
            </ul>
          </div>
        </div>
      </div>

```

• Answer Script

```

254  <!-- question start -->
255  <!-- https://stackoverflow.com/questions/15320069/how-to-prevent-user-pasting-text-in-a-textbox -->
256  <form action="answer_script.php?id=<?php echo $question_id; ?>&title=<?php echo $title; ?>&ct=<?php
echo $course_title; ?>&cc=<?php echo $course_code; ?>&batch=<?php echo $batch; ?>&sec=<?php echo
$section; ?>" method="POST">
257    <?php foreach ($infos as $info) { ?>
258      <!-- hidden form data -->
259      <input type="hidden" name="ansName" value="<?php echo $name; ?>">
260      <input type="hidden" name="ansId" value="<?php echo $student_id; ?>">
261      <input type="hidden" name="ansBatch" value="<?php echo $batch; ?>">
262      <input type="hidden" name="ansSec" value="<?php echo $section; ?>">
263      <input type="hidden" name="ansQuestion_ID" value="<?php echo $info['Question_Description_ID']; ?>">
264
265      <div class="row">
266        <div class="col mt-5">
267          <p class="form-group px-xs-0 px-sm-0 px-md-3 px-lg-5 px-xl-5 mx-xs-1 mx-sm-1 mx-md-3 mx-lg-5
mx-xl-5 mb-5">
268            <label class="control-label col-sm-12 d-flex justify-content-center" for="Title"><b><?php
echo $info['Content']; ?></b></label>
269
270
271            <textarea id="summernote" name="answer" class="form-control" onkeypress='validate(event)'
value="${cpCon.receiveNo}" autocomplete=off required></textarea>
272            <script>
273              $('#summernote').summernote({
274                placeholder: '#Your Answers will be written here :)',
275                tabsize: 2,
276                height: 500
277              });
278            </script>

```

9.5 Admin Dashboard

- Contact Info

```
48 |     <table class="table table-hover">
49 |       <thead class="table-secondary">
50 |         <tr class='bg-dark text-white'>
51 |           <th scope="col">ID</th>
52 |           <th scope="col">Name</th>
53 |           <th scope="col">Email</th>
54 |           <th scope="col">Received At</th>
55 |           <th scope="col">Action</th>
56 |         </tr>
57 |       </thead>
58 |       <tbody>
59 |         <?php foreach ($infos as $info) {?>
60 |
61 |           <tr onclick="window.location='admin_contact_details.php?id=<?php echo $info['ID'] ?>';">
62 |             <th scope="row"><?php echo htmlspecialchars($info['ID']); ?></th>
63 |             <td><?php echo htmlspecialchars($info['Name']); ?></td>
64 |             <td><?php echo htmlspecialchars($info['Email']); ?></td>
65 |             <td><?php echo htmlspecialchars($info['Received_Datetime']); ?></td>
66 |             <td><a href="admin_contact_details.php?id=<?php echo $info['ID'] ?>"><i class="fas fa-edit">/>
67 |               / <i class="far fa-trash-alt"></i></a></td>
68 |           </tr>
69 |
70 |         <?php }?>
71 |       </tbody>
72 |     </table>
```

- Contact Details

```
70 |     <div class="col-xl-9 col-lg-9 col-md-10 col-sm-9 col-xs-6 my-5">
71 |       <?php foreach ($infos as $info) {?>
72 |         <p><b>Name: </b><?php echo $info['Name']; ?> &nbsp; <b> ID:</b> <?php echo $info['ID'] ?></p>
73 |         <p><b>Email: </b><?php echo $info['Email']; ?></p>
74 |         <p class="mb-4"><b>Received Date & Time: </b><?php echo $info['Received_Datetime']; ?></p>
75 |         <p style="overflow-wrap: break-word;"><b>Message: </b><?php echo $info['Message']; ?></p>
76 |
77 |
78 |         <!-- Delete Button -->
79 |
80 |         <form action="admin_contact_details.php" method="POST" class="d-flex justify-content-end">
81 |
82 |           <input type="hidden" name="id_to_delete" value="<?php echo $info['ID'] ?>">
83 |           <input type="submit" name="delete" value="Delete record" class="btn btn-danger mt-5">
84 |             <?php echo $error; ?>
85 |           </form>
86 |         <?php }?>
87 |
88 |         <?php echo $no_data; ?>
89 |
90 |     </div>
```

- Contact Delete

```

13 //deleting record
14 if (isset($_POST['delete'])) {
15     $id_to_delete = $_POST['id_to_delete'];
16
17     $sql = "DELETE FROM Student WHERE Student_ID = $id_to_delete";
18     $stmt = $pdo->prepare($sql);
19     $stmt = $pdo->query($sql);
20
21     if ($stmt) {
22         header('Location: admin_student_info.php');
23     } else {
24         $error = '<label class="alert alert-danger">Something went wrong.</label>';
25     }
26 }

```

- Teacher Info

```

59 <table class="table table-hover">
60     <thead class="table-secondary">
61         <tr class="bg-primary text-white">
62             <th scope="col">ID</th>
63             <th scope="col">Name</th>
64             <th scope="col">Email</th>
65             <th scope="col">Registration Datetime</th>
66             <th scope="col">Action</th>
67         </tr>
68     </thead>
69     <tbody>
70         <?php foreach ($infos as $info) (?>
71
72             <tr onclick="window.location='admin_teacher_details.php?id=<?php echo $info['Teacher_ID'] ?>'>
73                 <th scope="row"><?php echo htmlspecialchars($info['Teacher_ID']); ?></th>
74                 <td><?php echo htmlspecialchars($info['Name']); ?></td>
75                 <td><?php echo htmlspecialchars($info['Teacher_Email']); ?></td>
76                 <td><?php echo htmlspecialchars($info['Registration_Datetime']); ?></td>
77                 <td><a href="admin_teacher_details.php?id=<?php echo $info['Teacher_ID'] ?>">More Info</a></td>
78             </tr>
79
80         <?php ?>
81     </tbody>
82 </table>

```

- Teacher Details

```

71 <div class="col-12 col-lg-9 col-md-10 col-sm-9 col-xs-6 my-5">
72     <?php foreach ($infos as $info) (?>
73
74         <p><b>Teacher ID: </b><span class="text-primary"><?php echo $info['Teacher_ID']; ?></span></p>
75         <p><b>Name: </b><span class="text-primary"><?php echo $info['Name']; ?></span></p>
76         <p><b>Department: </b><span class="text-primary"><?php echo $info['Department']; ?></span></p>
77         <p><b>Email: </b><span class="text-primary"><?php echo $info['Teacher_Email']; ?></span></p>
78         <p><b>Registration Date & Time: </b><span class="text-primary"><?php echo $info['Registration_Datetime']; ?></span></p>
79
80         <!-- Delete Button -->
81
82         <form action="admin_teacher_details.php" method="POST" class="d-flex justify-content-end">
83
84             <input type="hidden" name="id_to_delete" value="<?php echo $info['Teacher_ID'] ?>">
85             <input type="submit" name="delete" value="Delete record" class="btn btn-danger mt-5">
86
87         </form>
88
89     <?php ?>
90
91     <?php echo $no_data; ?>
92 </div>

```

- Insert Teacher Info

```

16 if (isset($_POST["insert"])) {
17
18     //check name
19     if (empty($_POST['name'])) {
20         $errors['name'] = 'A name is required';
21     } else {
22         $name = $_POST['name'];
23         if (!preg_match('/^a-zA-Z\s+$/', $name)) {
24             $errors['name'] = 'Name must be letters and spaces only';
25         }
26     }
27
28     //teacher id check
29     if (empty($_POST['teacherId'])) {
30         $errors['teacherId'] = 'Teacher ID is required.';
31     } else {
32         $teacherId = $_POST['teacherId'];
33         if (!preg_match('/^0-9+$/', $teacherId)) {
34             $errors['teacherId'] = 'ID must be numbers only.';
35         }
36     }
37
38     //check department
39     if (empty($_POST['department'])) {
40         $errors['department'] = 'Department name is required.';
41     } else {
42         $department = $_POST['department'];
43         if (!preg_match('/^a-zA-Z\s+$/', $department)) {
44             $errors['department'] = 'Department name must be letters and spaces only!';
45         }
46     }
47
48     if (empty($_POST['email'])) {
49         $errors['email'] = 'An email is required';
50     } else {
51         $email = $_POST['email'];
52         if (!filter_var($email, FILTER_VALIDATE_EMAIL)) {
53             $errors['email'] = "Email has to be a valid email address.";
54         }
55     }
56
57     if (mb_strlen($_POST['password']) < 6) {
58         $errors['password'] = 'Password Must Contain At Least 6 Characters!';
59     } elseif (!preg_match('#[0-9]+#', $_POST['password'])) {
60         $errors['password'] = 'Your Password Must Contain At Least 1 Number!';
61     } else {
62         $password_polish = trim($_POST['password']);
63         $salt = '6JDs,+w^q;-57Qc,Zz:g[=8[r==FC';
64         $password = md5($salt . $password_polish);
65     }
66     if (array_filter($errors)) {
67     } else {
68         try {
69             require_once "assets/connect/pdo.php";
70             $pdo->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
71             $sql = "INSERT INTO teacher (Teacher_ID, Name, Department, Teacher_Email, Password) VALUES
72             ($teacherId, '$name', '$department', '$email', '$password')";
73             $pdo->exec($sql);
74             $success = "<label class='alert alert-success'>Data Inserted Successfully!</label>";
75         } catch (PDOException $e) {
76             $err = $e->getMessage();
77             $failed = "<label class='alert alert-danger'>Data insertion failed. Please try again. $err </
78             label>";
79         }
80     }
81
82 }

```

- Student Info

```
61 | | | | <!-- Search Button Functionality -->
62 | | | | <?php
63 |
64 require_once "assets/connect/pdo.php";
65
66 if (isset($_POST["search"])) {
67     $id = $_POST["id_to_search"];
68
69     $sql = $pdo->prepare("SELECT * FROM `Student` WHERE Student_ID = '$id'");
70     $sql->setFetchMode(PDO::FETCH_OBJ);
71     $sql->execute();
72
73     if ($row = $sql->fetch()) {
74         ?>
75         | | | <p class="mt-3 text-success"><?php echo $row->Student_ID . ' - ' . $row->FirstName . ' ' .
76         | | | $row->LastName . ' '; ?><a href="admin_student_details.php?id=<?php echo $row->Student_ID; ?>">
77         | | | (More details)</a></p>
78     } else {
79         echo "<label class='alert alert-danger'>
80             ID does not exist. &emsp;
81             <button type='button' class='close' data-dismiss='alert' aria-label='Close'>
82                 <span aria-hidden='true'>&times;</span>
83             </button></label>";
84     }
85
86 ?>
87
88
89
90
91
92
93
94
95 <table class="table table-hover text-center">
96     <thead class="table-secondary">
97         <tr class='bg-success text-white'>
98             <th scope="col" colspan="2">Sort Student List by Batch</th>
99         </tr>
100     </thead>
101     <tbody>
102         <?php foreach ($infos as $info) {?>
103
104             <tr onclick="window.location='admin_student_by_batch.php?batch=<?php echo $info['Batch']; ?>'>
105                 <th scope="row">Batch: <span class="text-primary"><?php echo htmlspecialchars($info['Batch']); ?></span></th>
106                 <td class="text-right">Total Number of Registered Student: <b class="text-success"> <?php
107                 echo htmlspecialchars($info['COUNT(Batch)']); ?></b></td>
108             </tr>
109
110         <?php }?>
111     </tbody>
112 </table>
113 ...
```

- Student Details

```

71 |     <div class="col-xl-9 col-lg-9 col-md-10 col-sm-9 col-xs-6 my-5">
72 |       <?php foreach ($infos as $info) ??>
73 |         <p><b>Name: </b><span class="text-primary"><?php echo $info['FirstName'] . ' ' . $info['LastName'] ?></span></p>
74 |         <p><b>Profile ID: </b><span class="text-primary"><?php echo $info['Profile_ID']; ?></span></p>
75 |         <p><b>Student ID: </b><span class="text-primary"><?php echo $info['Student_ID']; ?></span></p>
76 |         <p><b>Batch: </b><span class="text-primary"><?php echo $info['Batch']; ?></span></p>
77 |         <p><b>Section: </b><span class="text-primary"><?php echo $info['Section']; ?></span></p>
78 |         <p><b>Email: </b><span class="text-primary"><?php echo $info['Student_Email']; ?></span></p>
79 |         <p><b>Email Status: </b><span class="<?php if ($info['Student_Email_Status'] != 'verified') { ?>
80 |           $status = 'text-danger';
81 |         } else {
82 |           $status = 'text-success';
83 |         }
84 |         echo $status?>"><?php echo htmlspecialchars($info['Student_Email_Status']); ?></span></p>
85 |         <p><b>OTP: </b><span class="text-primary"><?php echo $info['Student_Otp']; ?></span></p>
86 |         <p><b>Activation Code: </b><span class="text-primary"><?php echo $info['Student_Activation_Code'] ; ?></span></p>
87 |         <p><b>Registration Date & Time: </b><span class="text-primary"><?php echo $info ['Registration_Datetime']; ?></span></p>
88 |         <!-- Delete Button -->
89 |         <form action="admin_student_details.php" method="POST" class="d-flex justify-content-end">
90 |
91 |           <input type="hidden" name="id_to_delete" value="<?php echo $info['Student_ID'] ?>">
92 |           <input type="submit" name="delete" value="Delete record" class="btn btn-danger mt-5">
93 |
94 |         </form>
95 |
96 |       <?php ??>
97 |
98 |       <?php echo $no_data; ?>
99 |     </div>

```

- Student Info by Batch

```

11 //getting the data by query parameter
12 if (isset($_GET['batch'])) {
13   $batch = $_GET['batch'];
14
15   $stmt = $pdo->query("SELECT * from Student WHERE Batch = $batch ORDER BY Student_ID");
16   $infos = $stmt->fetchAll(PDO::FETCH_ASSOC);
17
18   // counting
19   $stmt2 = $pdo->query("SELECT COUNT(Section), Section, Batch from Student WHERE Batch = $batch GROUP BY Section");
20   $sections = $stmt2->fetchAll(PDO::FETCH_ASSOC);
21
22 } else {
23   $no_data = '<h5 class="alert alert-danger">No data available.</h5>';
24 }

```

```

85     <table class="table table-hover text-center">
86         <thead class="table-secondary">
87             <tr class='bg-success text-white'>
88                 <th scope="col">Student Id</th>
89                 <th scope="col">Name</th>
90                 <th scope="col">Section</th>
91                 <th scope="col">Batch</th>
92                 <th scope="col">Email</th>
93                 <th scope="col">Status</th>
94                 <th scope="col">Action</th>
95             </tr>
96         </thead>
97         <tbody>
98             <?php foreach ($infos as $info) {?>
99                 <tr onclick="window.location='admin_student_details.php?id=<?php echo $info['Student_ID'] ?>'>
100                     <th scope="row"><?php echo htmlspecialchars($info['Student_ID']); ?></th>
101                     <td><?php echo htmlspecialchars($info['FirstName'] . ' ' . $info['LastName']); ?></td>
102                     <td><?php echo htmlspecialchars($info['Section']); ?></td>
103                     <td><?php echo htmlspecialchars($info['Batch']); ?></td>
104                     <td><?php echo htmlspecialchars($info['Student_Email']); ?></td>
105                     <td><span class="<?php if ($info['Student_Email_Status'] != 'verified') {>
106                         $status = 'text-danger';
107                     } else {
108                         $status = 'text-success';
109                     }
110                     echo $status?>"><?php echo htmlspecialchars($info['Student_Email_Status']); ?></span></td>
111                     <td><a href="admin_student_details.php?id=<?php echo $info['Student_ID'] ?>">More info</a></td>
112                 </tr>
113             <?php }?>
114             <?php echo $no_data; ?>
115         </tbody>
116     </table>

```

• Student Info by Section

```

13     //getting the data by query parameter
14     if (isset($_GET['batch']) && isset($_GET['section'])) {
15         $batch = $_GET['batch'];
16         $section = $_GET['section'];
17
18         $stmt = $pdo->query("SELECT * from Student WHERE Batch = $batch AND Section = '$section' ORDER BY
19             Student_ID");
20         $infos = $stmt->fetchAll(PDO::FETCH_ASSOC);
21
22         //total student count
23         $stmt2 = $pdo->query("SELECT COUNT(Section) from Student WHERE Batch = $batch AND Section = '$section'");
24         $infos2 = $stmt2->fetchAll(PDO::FETCH_ASSOC);
25     } else {
26         $no_data = '<h5 class="alert alert-danger">No data available.</h5>';
27     }
28
29
30     <tbody>
31         <?php foreach ($infos as $info) {?>
32
33             <tr onclick="window.location='admin_student_details.php?id=<?php echo $info['Student_ID'] ?>'>
34                 <th scope="row"><?php echo htmlspecialchars($info['Student_ID']); ?></th>
35                 <td><?php echo htmlspecialchars($info['FirstName'] . ' ' . $info['LastName']); ?></td>
36                 <td><?php echo htmlspecialchars($info['Section']); ?></td>
37                 <td><?php echo htmlspecialchars($info['Batch']); ?></td>
38                 <td><?php echo htmlspecialchars($info['Student_Email']); ?></td>
39                 <td><span class="<?php if ($info['Student_Email_Status'] != 'verified') {>
40                     $status = 'text-danger';
41                 } else {
42                     $status = 'text-success';
43                 }
44                 echo $status?>"><?php echo htmlspecialchars($info['Student_Email_Status']); ?></span></td>
45                 <td><a href="admin_student_details.php?id=<?php echo $info['Student_ID'] ?>">More info</a></td>
46             </tr>
47
48             <?php }?>
49             <?php echo $no_data; ?>
50         </tbody>

```

Chapter – 10

Testing

This section describes the testing of the project in terms of working environment platform, the main functional requirements and the non-functional requirements achievement according to the predefined objectives.

10.1 Platform Testing

The website is tested on different browsers like Google Chrome, Firefox, Microsoft Edge, Opera and other browsers. And it runs perfectly well in all sort of browser. It is also been tested for different views like different model mobile or tablet for determining if it works responsively.

While the testing the website was working totally fine. The question creation and posting question worked perfectly alongside this the generation of meeting link and posting it for the students also was working. The students could see the posted question and also got the meeting link posted by the teacher during the testing.

10.2 Requirement Testing

All functional and non-functional requirements are tested. Regarding functional testing the website is working for creating and posting question for the examination and also meeting generation via Google Meet or Zoom are tested. The GUI for this website is simple and attractive also easy to use for the end user.

This website is designed in a way to be flexible for Leading University. That means anyone from Leading University students or teacher can use it from anywhere.

Chapter – 11

Conclusion

11.1 Conclusion

The project deals with the main functions of the web-based Online Examination System as stated in the introduction. The ultimate goal of this project was to design a website that includes the services of an exam system that can be conducted online whenever needed. Another consideration was there was no such system on our own where a teacher can examine the circumstances like the COVID-19 pandemic. Therefore, we tried this new concept of making an Online Examination System.

The main objectives of the project were achieved and the user of the website can easily handle it. A teacher can create a question to take the exam and also if the teacher wants to conduct a viva or presentation via Google Meet or Zoom can easily schedule the meeting using this website. On the other hand, students can attend the exam remotely from anywhere and also can attend the meeting created by the respective teacher.

The website can run through a web browser like Chrome, Firefox, Microsoft Edge, Opera, and any other web browser.

Finally, it was a good exposure to our work on this project. We learned so many lessons by working together as a team and make a fully functional website within a certain period.

11.2 Further Work

However, there are some further works that need to be done.

- The assignment posting and collecting the assignment from the students on time function needs to be added.
- Exam routine publication function for the students' needs to be implemented.
- We have to consider the auto-checking answer function for the short question-answer so that teacher can easily determine the score of a student.
- Another consideration for the result publication through this website can be added so that a student can easily find his/her result after logging in to his dashboard.
- All the registered student list for the particular semester can be shown in the teacher dashboard, by this, a teacher will be able to determine how many students he/she is dealing with for that semester.
- We want to add quiz type question functionalities that can be made by the teacher if needed
- We added the clock in the answer script but couldn't execute the stopwatch function, so we want to include the stopwatch function in the answer script.

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