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*In partial fulfillment of the requirements for the degree of*

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By

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*Title of the project*

# Web application for distant education

*Under the supervision of*

**Bahache Mohamed**

*JUIN, 2023*

رقم: .....

## Acknowledgments

First, we thank Almighty God who has guided us to do this work and help us in the completion of this small project.

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# General introduction

In recent years, the field of education has witnessed a rapid transformation due to advancements in technology. The emergence of web-based platforms and applications has revolutionized the way we learn, breaking down barriers of time and space. With the global shift towards remote learning, the need for effective and user-friendly web applications tailored for distant education has become paramount.

E-learning (distant learning) refers to the use of digital tools for learning, including learning management systems and distant education. Over the years, there have been several significant developments in the e-learning industry, including the Appearance of social networking and online learning communities, the widespread use of smartphones, and the Internet. Other notable developments include advancements in Intelligent Tutoring Systems, the growth of the free Open educational Resources movement, and the creation of immersive environments that enable users to engage with virtual environments and digitally augment their experience of the real world. [1]

With this notable advancements in the e-learning sector, and the growing need to create e-learning platforms as we mentioned before we aim to create a comprehensive web application tailored to the needs of educators and learners. Our goal is to empower educators with tools that facilitate content delivery, interactivity, and assessment while simultaneously providing students with a rich and engaging learning experience.

This report is structured in three chapters. The first chapter contain a description to the main subject of our project. The second chapter proposes a project design from a technical point and detailed design. Finally, the third chapter discusses the practical implementation and presents the different parts of the application

# Chapter 1 General definitions related to the project

## 1. What's an e-learning system?

An e-learning system is an electronic platform or software that provides teachers, managers, trainers, and learners with a set of interactive features to help with the management, delivery, and receipt of learning content. It provides resources to create courses and learning materials. An e-learning system makes creating learning materials and completing training easy. Updating learning content without managing printed materials and manual distribution is also more convenient. One type of eLearning platform is a learning management system (LMS).[2]

## 2. Goals

The goals of e-learning systems are to enhance the quality of learning and teaching, meet the learning style or needs of students, improve efficiency and effectiveness, improve user-accessibility and time flexibility to engage learners in the learning process. Learning objectives are also an important part of every e-learning course as they guide you as you select the content and activities to include and help you determine whether your course has been effective.

## 3. Previous works

With the rise of e-learning, there are now many websites available that offer courses on a wide range of topics. In this section, we will take a look at some of the most popular e-learning websites and what they have to offer.

### 3.1. Coursera

Coursera is an online learning platform that offers self-paced guided projects and on-demand courses on a variety of subjects. It was founded by Daphne Koller and Andrew Ng in 2012 with a vision of providing life-transforming learning experiences to learners around the world. Today, Coursera is a global platform for online learning and career development that offers anyone, anywhere, access to online courses and degrees from leading universities and companies [3].**Figure 1**

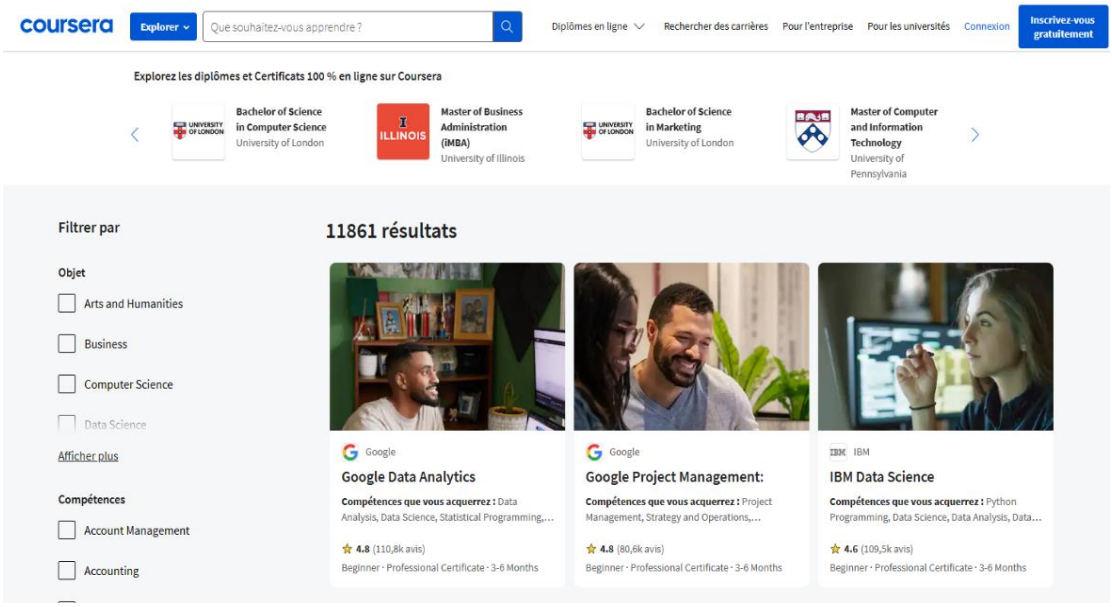


***Figure 1:Coursera Platform***

### 3.2. Moodle

Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments. It is a free, online Learning Management system enabling educators to create their own private website filled with dynamic courses that extend learning, anytime, anywhere. Moodle's extremely customizable core comes with many standard features. Moodle is one of the largest open-source learning managing system (LMS), which provides unique remote learning experience powered with secured privacy services, on figure 2 we put home page of Moodle [3]. **Figure 2**


***Figure 2:Moodle Platform***

### 3.3. Udemy

Udemy is an online learning and teaching platform that allows instructors to build online courses on their preferred topics. Using Udemy's course development tools, instructors can upload videos, source code for developers, PowerPoint presentations, PDFs, audio, ZIP files and any other content that learners might find helpful. Udemy has over 200,000 courses and more than 70,000 instructors teaching courses in nearly 75 languages. You can learn programming, marketing, data science and more on Udemy [3]. **Figure 3**

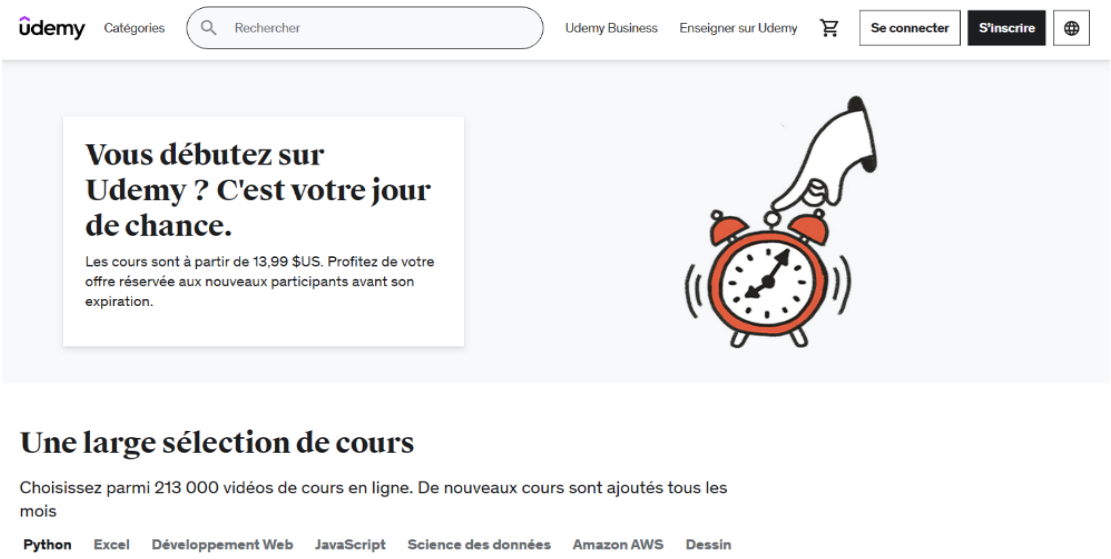


*Figure 3: Udemy Platform*

## 4. Distant learning & AI

The use of AI models offer immense potential to improve the distant learning experience and make it more personalized and adaptive. Models like ChatGPT and Google's Bard can act as intelligent tutors or teaching assistants that provide help and guidance on demand. ChatGPT, for example, can help answer student questions in natural language and provide explanations that would be on par with a human tutor. Similarly, Bard and other AI language models can enhance traditional e-learning content by providing contextualized definitions, summaries, concepts maps and other study aids tailored specifically to the students' questions.

## 5. Conclusion

In conclusion, this chapter provided an overview of distant learning, discussing its definition and the various tools and platforms used to support distant learning with examples of the most famous e-learning websites, which offer a range of courses and learning materials.

In the next chapter, we will go deeper into the design and architecture of our e-learning website.

# Chapter 2 Application Design

## 1. INTRODUCTION

In our project life cycle, design is an essential and crucial stage for producing a high-quality website. In the design stage, we bring more details to the solution and try to explain and describe our project accurately.

## 2. Unified Modeling Language

UML, or Unified Modeling Language, is a modeling language used in the design of software, websites, and information systems. It provides graphic symbols to represent the various components of a system, such as objects, relationships, and behaviors. UML helps software and website developers visualize the overall look and interactions of a program. Helps understand software design, facilitate team collaboration, support code reuse, and documentation systems. [4]

### 2.1. UML Goals

The UML was invented primarily to address the challenges faced in the design and architecture of complex systems. The basic objectives or goals behind UML modeling are

**1-** To provide a unified modeling language for software systems that can be easily understood by developers and managers

**2-** To facilitate communication and collaboration among all stakeholders involved in developing a software system.

**3-** To support the design and development of complex software systems through a variety of UML diagrams.

**4-** Incorporate the best possible practices at par with the industry standard

## 3. Why we choose UML Language?

UML was chosen for our e-learning application project because it is a widely recognized standard for modeling software systems and accommodates different types of systems and domains. It is also supported by various modeling tools, making it a practical choice for development. Overall, UML's flexibility and ability to promote

good software engineering practices made it the ideal choice for modeling our e-learning website.

# 4. UML Diagrams

## 4.1. Use Case Diagram

The Use Case Diagram is a UML diagram that provides a visual representation of the system's functionality from the user's perspective. It helps to identify the various ways in which users interact with the system and the different types of users who interact with it. By creating a Use Case Diagram for our e-learning website, we were able to identify the key features that our system needed to provide, such as course navigation, passing quizes, and course creation. The Use Case Diagram was also used as a tool for determining system requirements and developing the user interface design for our website [5]. **Figure 4**

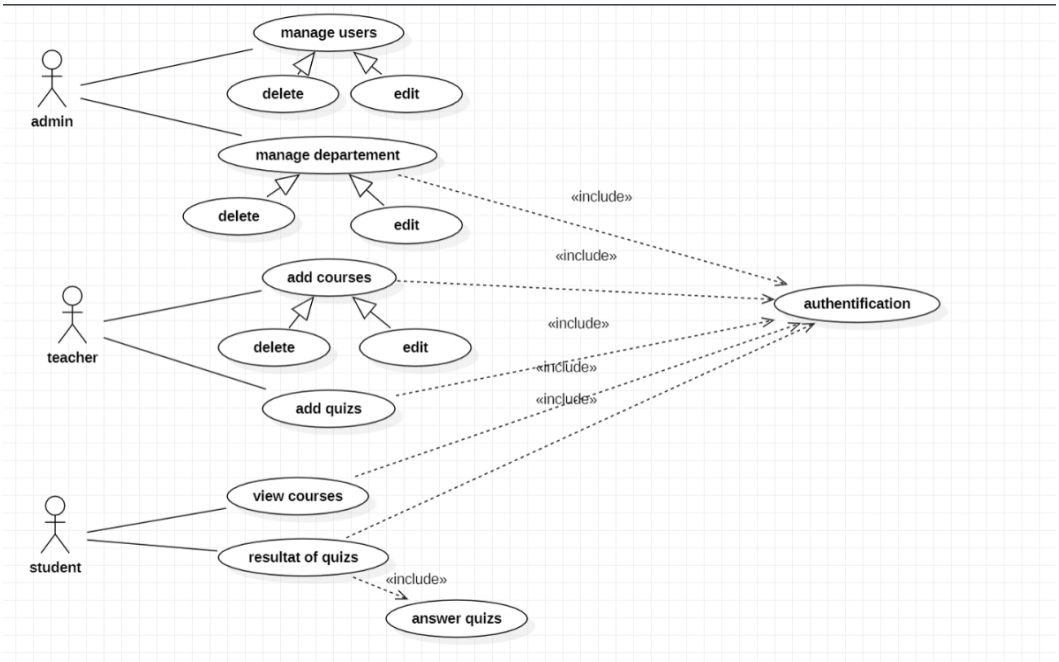


***Figure 4:Use case diagram***

## 4.2. Sequence Diagram

The Sequence Diagram shows the interactions between objects in a system over time. For our e-learning website project, we used it to model the interactions between the different components of our system, such as the user interface, database, and server. By creating a Sequence Diagram, we identified potential bottlenecks and ensured that the interactions between components were properly designed and implemented. It helped us to validate our system design and served as a communication tool between developers [5]. **Figure 5**

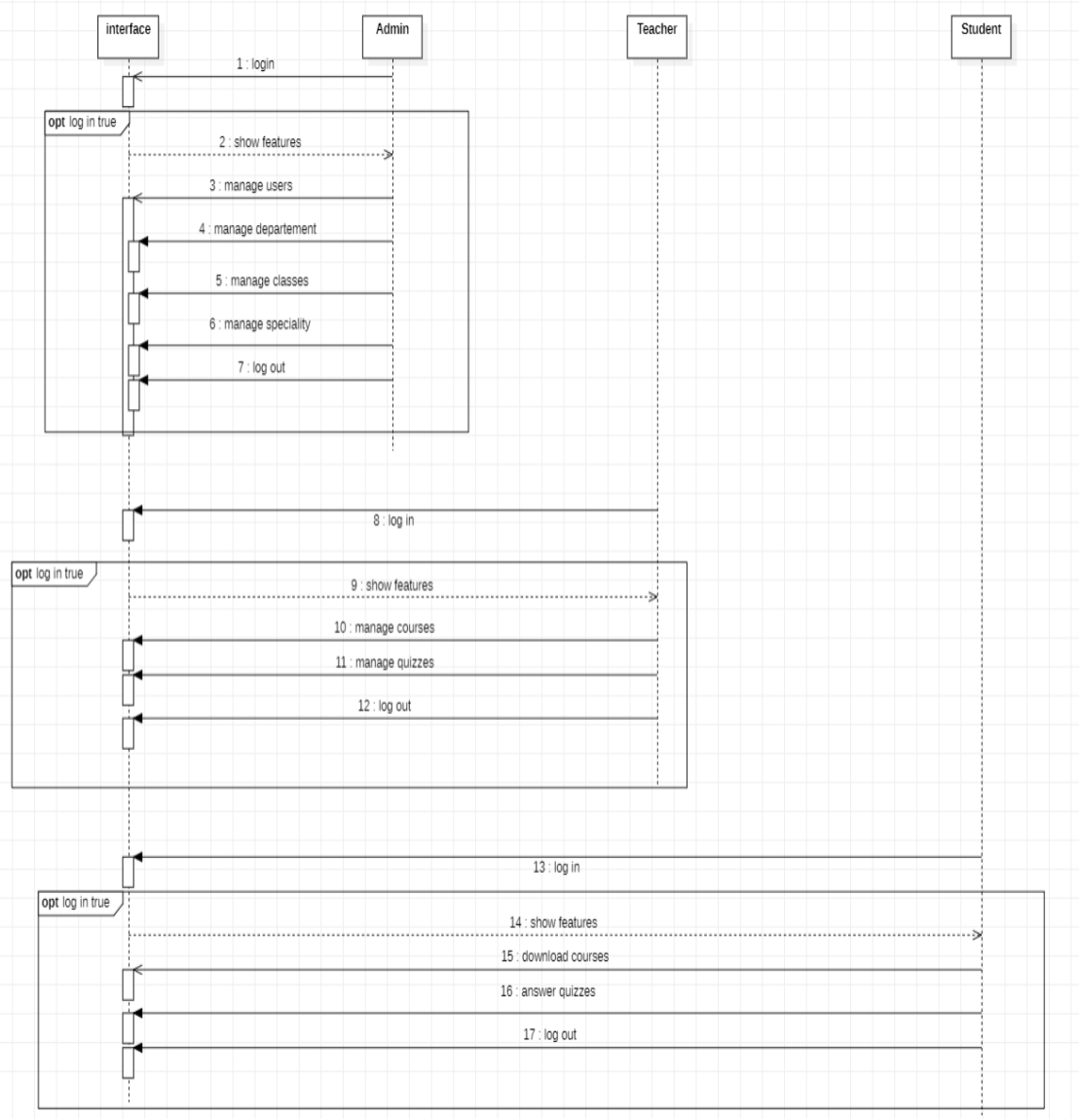


***Figure 5: Sequence diagrams***

## 4.3. Class Diagram

The Class Diagram is a UML diagram that illustrates the structure of a system by depicting the classes, attributes, methods, and relationships between them. In our e-learning website project, the Class Diagram helped us to design and implement the system's functionality, manage the system's complexity, and model the different entities in our system Overall, the Class Diagram was an essential tool in creating a well-organized and functional e-learning website [5]. **Figure 6**

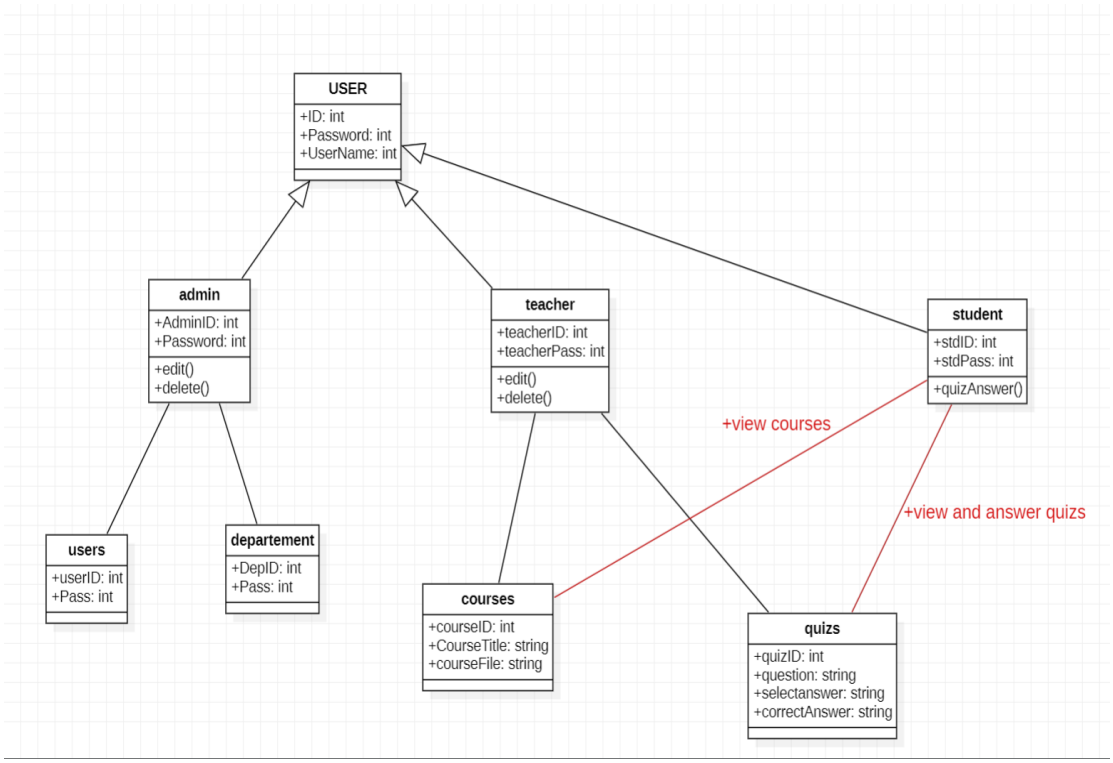


***Figure 6:Class diagram***

### 4.4. Activity Diagram

The Activity Diagram is a type of flowchart used in the UML to represent the flow of activities within a system or process. In our e-learning website project, it helped us model various user activities in a sequential order and identify decision points in the system. Overall, it ensures that this system is designed and implemented in a logical and efficient manner [5]. **Figure 7**

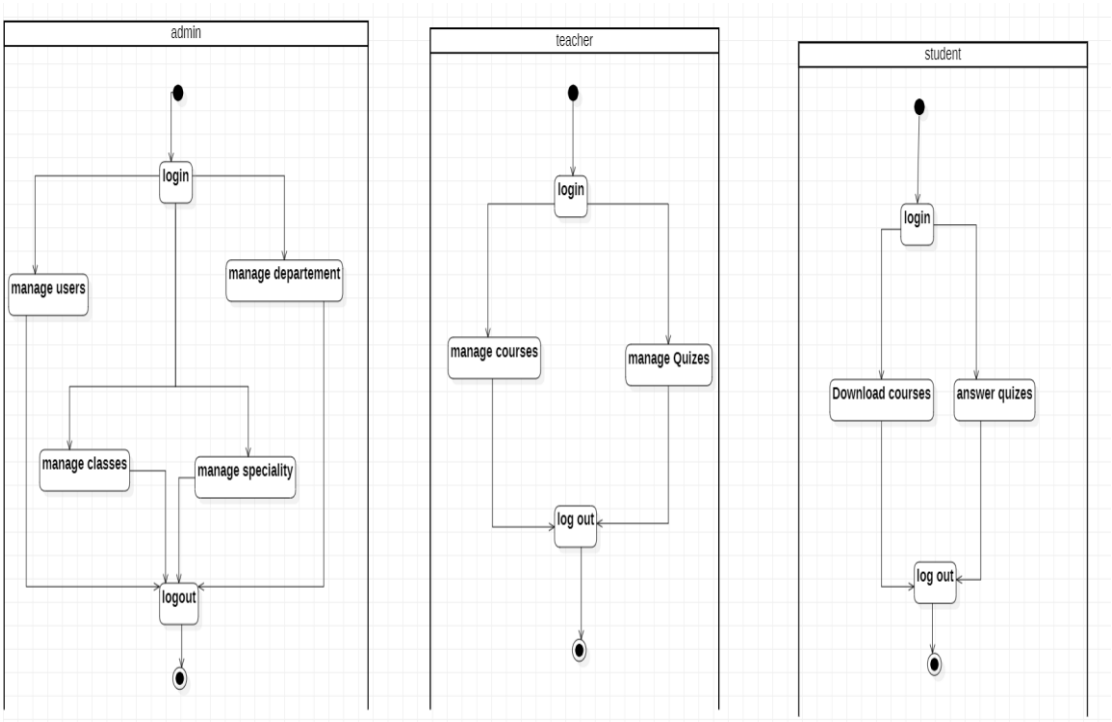


***Figure 7:Activity diagram***

## 5. Conclusion

In this chapter, we explored the development process of our e-learning website application, including the tools used to create a functional and user-friendly platform. We utilize UML diagrams, such as Use Case, Sequence, Class and Activity Diagrams, to visualize the system's functionality and interactions with users.

Moving forward, we will discuss our work environment and the key software programs and program interfaces that were instrumental in the development process.

# Chapter 3

# Application Development

## 1. Introduction

In this chapter, we delve into the development phase of our site, following the design. Here, we ensure that the website is not only usable but also completely ready we start by describing the working environment, as well as the tools and devices used during the development process. We highlight the programming languages used, and show the technical aspects that support the functionality of our site. Finally, we conclude this chapter by providing an overview of the graphical interfaces associated with our site.

## 2. Functionalities

In this section we will discuss different functional of different user.

### 2.1. Admin

- FR1: add new users
- FR2: edit/delete old users
- FR3: add new department
- FR4: edit/delete old department

### 2.2. Teacher

- FR1: add courses
- FR2: edit/delete old courses
- FR3: add quizes

### 3. Student

- FR1: view courses
- FR2: answer quizes

## 3. Data base Design

To develop a website that requires a database, we have many options to choose the database technology so we chose MySQL (phpMyAdmin).

## 3.1. PhpMyAdmin

PhpMyAdmin is a web-based tool used to administer and manage MySQL databases. It provides an easy-to-use interface to easily perform tasks such as creating databases and tables. PhpMyAdmin provides a set of features such as importing and exporting data, executing SQL queries, and optimizing database performance. [6]

We have created 4 tables for our website database (Users '**Figure 8**, Department '**Figure 9**, Courses '**Figure 10**, Quizes '**Figure 11**')

### 1. Users

| User_Id | User_name | User_Password | User_Type |
|---|---|---|---|
| 3 | haithem | 123 | ADMIN |
| 5 | nafea | 222 | TEACHER |
| 6 | mouhamed | 111 | STUDENT |

*Figure 8:Users table*

### 2. Department

| dep_id | dep_name | dep_dec |
|---|---|---|
| 1 | informatique | computer scinece |
| 2 | ST | science technologies |
| 3 | medcin | medcin |

*Figure 9:Departments table*

### 3. Courses

| id | title | description | file | class | dep_name |
|---|---|---|---|---|---|
| 3 | IR | recherche information | [BLOB - 12 o] | L1 | informatique |
| 32 | DSS | Data Semi Structer | [BLOB - 12 o] | M1 | informatique |

*Figure 10:Courses table*

### 4. Quizes

| quiz_id | quizTitle | questionText | answerText1 | answerText2 | answerText3 | answerText4 | correctAnswer | class | departement |
|---|---|---|---|---|---|---|---|---|---|
| 1 | name | whats my name ? | haithem | nafea | mohamed | aymen | 1 | M1 | informatique |
| 2 | affine | Nombre de clés possibles du chiffrement Affine est... | 26 | 144 | 312 | 676 | 1 | L3 | informatique |

***Figure 11:Quizes table***

## 4. Software Requirement

Web programming involves using several software tools to design, build, and publish a website or web application. The following are some of the software tools that were used to program this site

### 4.1. Visual Studio Code

Visual Studio Code (VS Code) is a free and open-source code editor developed by Microsoft. Support a wide range of languages.

### 4.2. XAMPP

XAMPP is a completely free, easy-to-install Apache division containing MySQL, PHP. The XAMPP wide open-source package has recently been set up to be incredibly easy to set up also to use. XAMPP allows website designers and developers to test their work on their own computer systems without Internet connection.is a perfect solution for web-developers, programmers or admins as it provides all the tools essential for their work.

#### 4.2.1. Advantages of XAMPP

**1.** Easy to install: XAMPP is easy to install and configure.

**2.** Cross-platform support: XAMPP is available for Windows, macOS, and Linux operating systems.

**3.** All-in-one solution: XAMPP includes all the necessary components for web development, such as Apache, MySQL, PHP, and Perl, in a single package.

**4.** Convenient for testing: XAMPP allows developers to test their web applications locally before deploying them to a remote server. This makes it easier to identify and fix bugs and errors in the application before it goes live.

## 4.3. PHP 

PHP is a popular server-side programming language. It is a scripting language designed to create dynamic and interactive web pages. PHP code is embedded in HTML code and runs on a web server to generate dynamic web content. PHP is open source and free to use. It supports different databases, such as MySQL and PostgreSQL. PHP is widely used to create content management systems, e-commerce websites, and other web applications.

## 4.4. HTML 

HTML (Hypertext Markup Language) is a markup language used to create and structure content for the web. It is the standard language used to create web pages and is used to define the structure and layout of a web page, including headings, paragraphs, lists, links, images, and other elements. HTML code is read and rendered by web browsers to display the content of a web page. [7]

## 4.5. CSS 

CSS (Cascading Style Sheets) is a style sheet language used to describe the presentation of web pages. It is used to define the layout, colors, fonts, and other visual elements of a web page, separate from its content written in HTML. CSS code is applied to HTML elements to change their appearance, and it allows web developers to create a consistent look and feel across multiple web pages. [8]

## 4.6. JAVASCRIPT 

JavaScript is a programming language used primarily for web development. It is a client-side scripting language, meaning it runs on the user's web browser and is used to create dynamic and interactive web pages. JavaScript is used to add functionality to web pages, such as form validation, creating pop-up windows, and animating elements on a web page. [9]

## 5. Hardware Requirement

1. DELL LATITUDE 7480: CPU i7 7600u 2,60TO – RAM 8GB DDR 4 – Hard Disk 256 GB SSD
2. ASUS GT540: CPU i7 3eme 2,60TO – RAM 8GB DDR 4 – Hard Disk 120 GB SSD

## 6. Interfaces

This part is for describing the implementation phase of this project, and we will review the main and secondary interfaces in order to clarify the different uses of the site more clearly.

### 6.1 Homepage

It is the first page when you open the site, if the "Get start" button is pressed, you will be directed to the users page.**Figure 12**

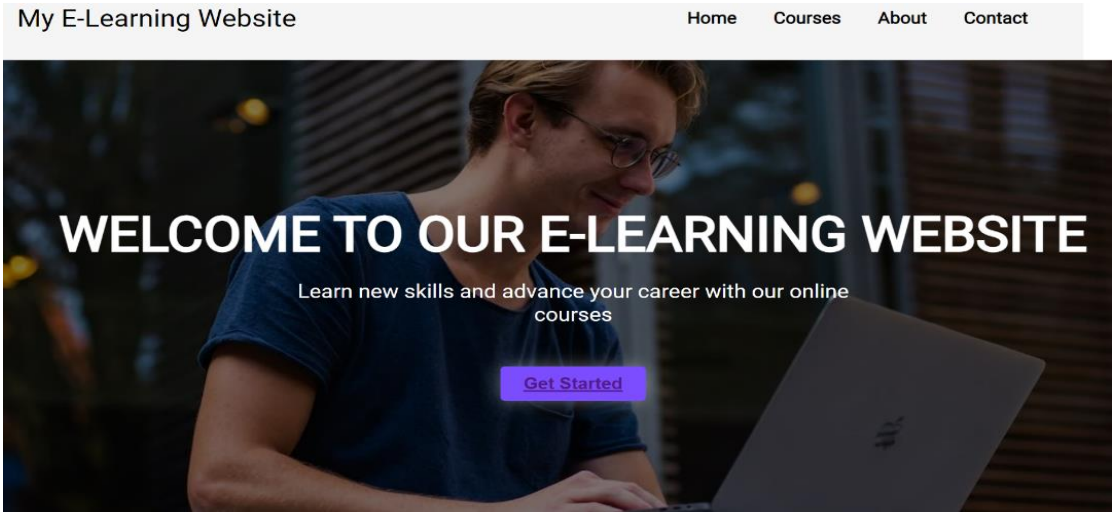


***Figure 12:Home page***

## 6.2 User Page **Figure 13**

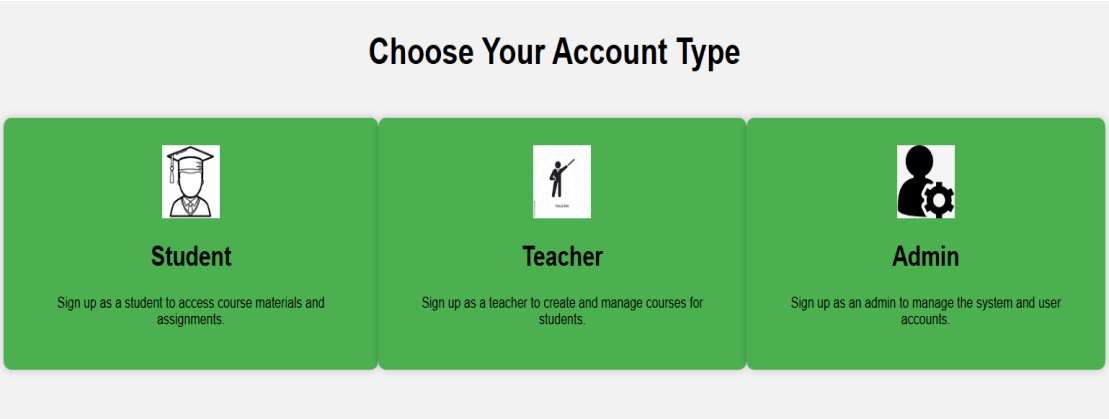


***Figure 13:User page***

## 6.3 Login Page

On this page, each user has a username and password that authorizes each user to enter his personal page. **Figure 14**

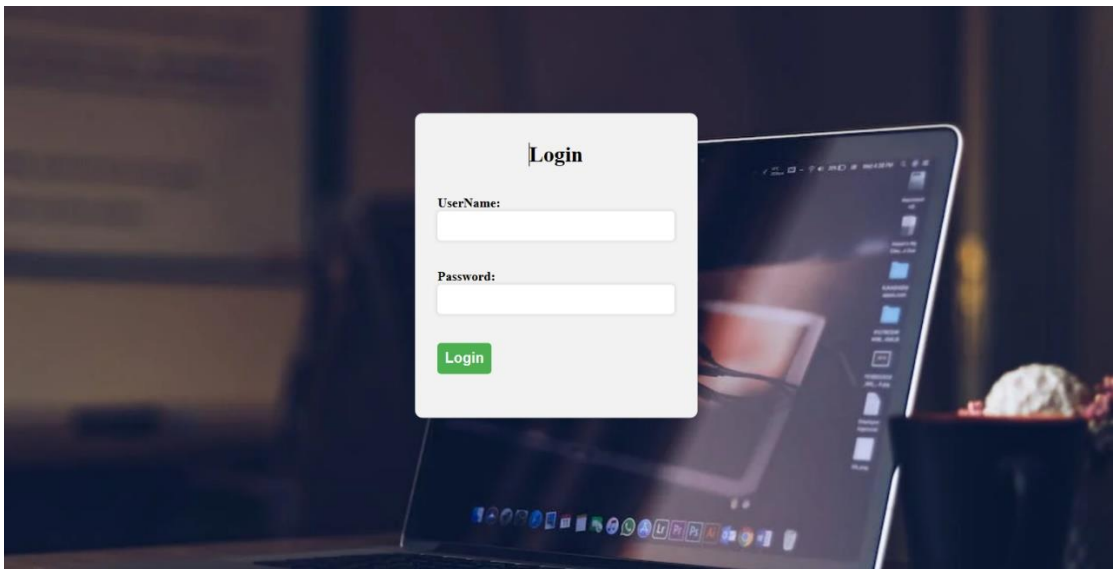


***Figure 14:Login page***

## 6.4 Administration Page

When the administrator enters, his personal page appears to him, he can know the number of users of this site as shown in **Figure 15**, with the ability to update the profile, manage department and manage users.

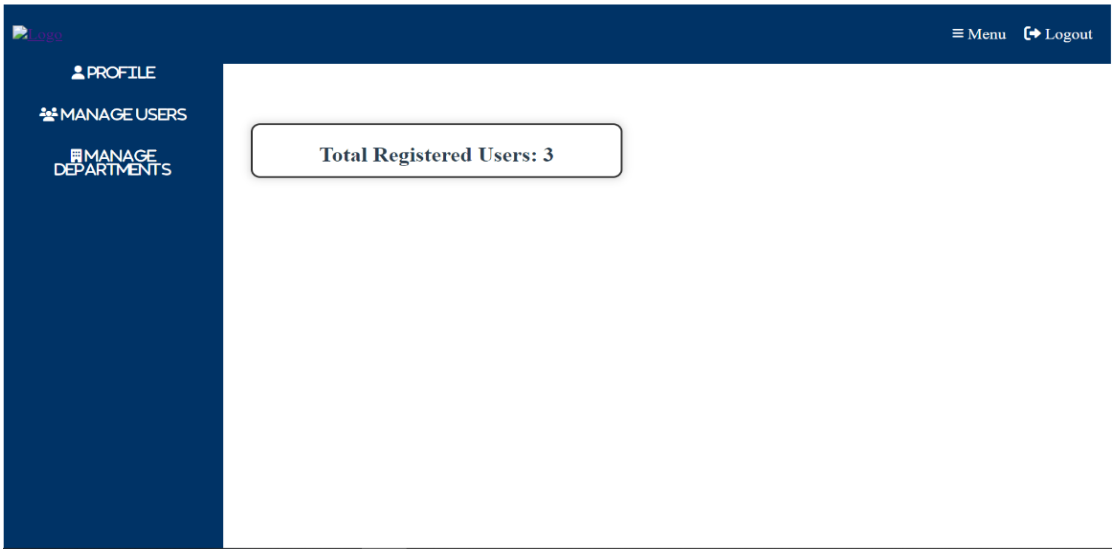


*Figure 15:Admin dashboard*

## 6.5 List of Users

When the admins press the Manage Users button, the page for the users on the site appears with the ability to modify or delete their information as we see on **Figure 16**.

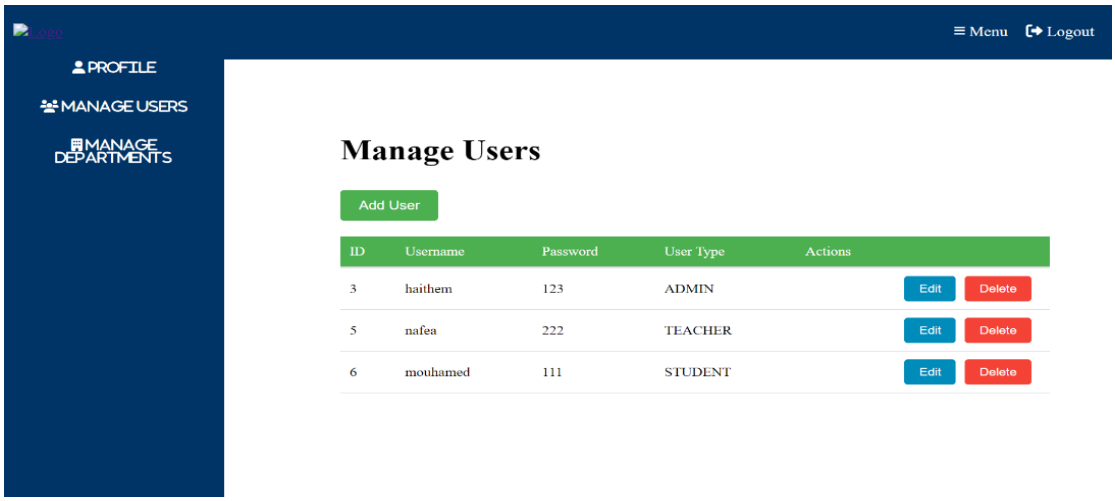


*Figure 16:Manage users page*

## 6.6 List of department

Administrators can also modify the sections, such as changing the name or description, or deleting the section, as we see **Figure 17**.

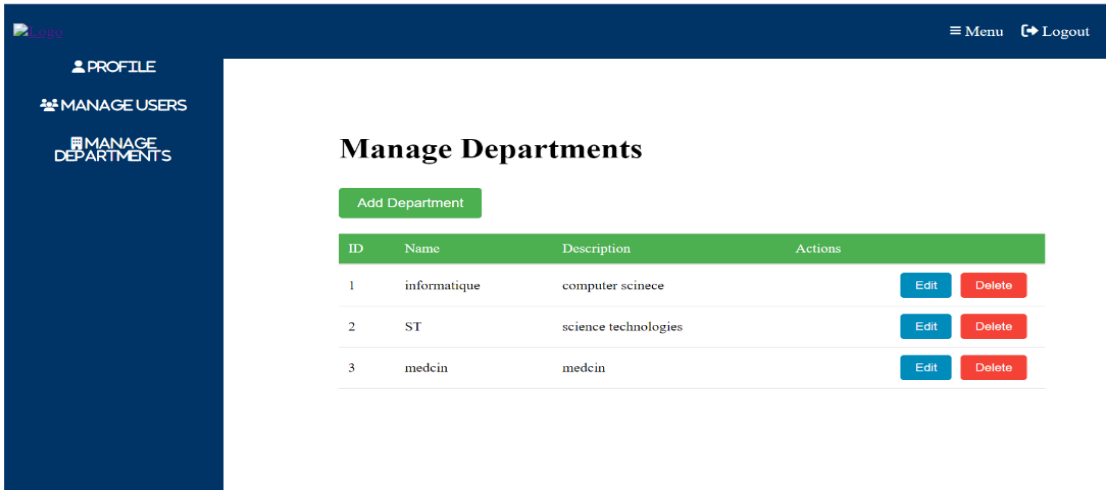


*Figure 17:Manage departments*

## 6.7 Teacher Page

The same thing with the professor. When logging in, his interface appears. Where does information about students, lessons, and exams appear? The professor can edit his profile, manage courses and add Quizes like we see on **Figure 18**.

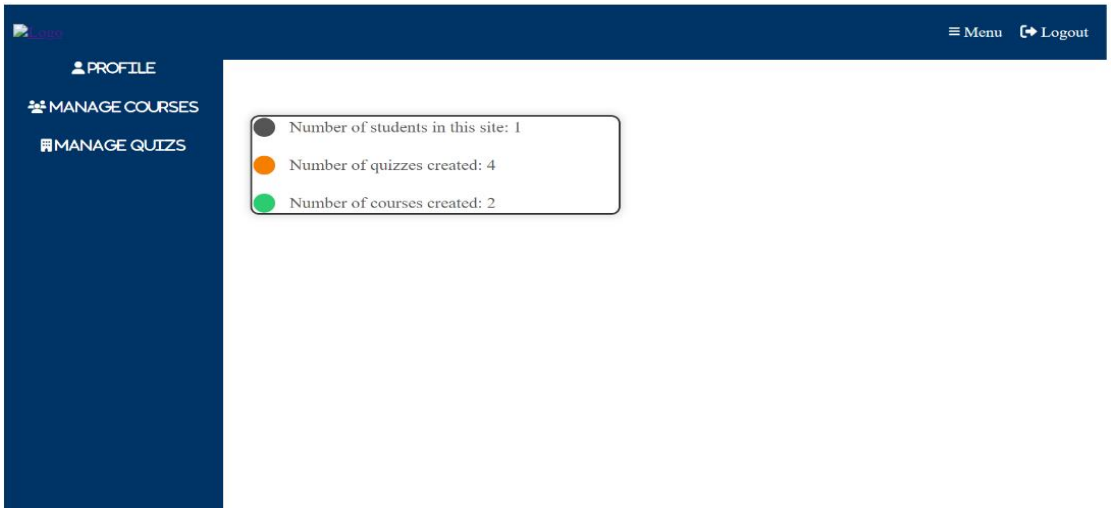


*Figure 18:Teacher dashboard*

## 6.8 Manage Courses

Here is where the list of lessons for the teacher appears. The teacher can modify or delete his lessons. See **Figure 19**

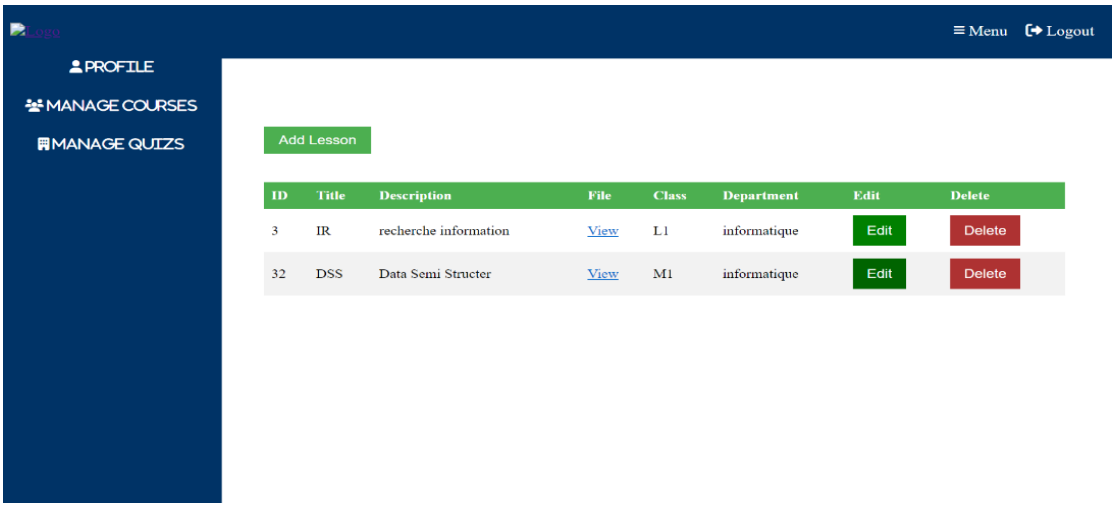


*Figure 19:Manage courses*

## 6.9 Manage quizes

The teacher can also set exams for the students, through figure 20 we see that he enters the necessary information for the exam that the student can pass. See **Figure 20**

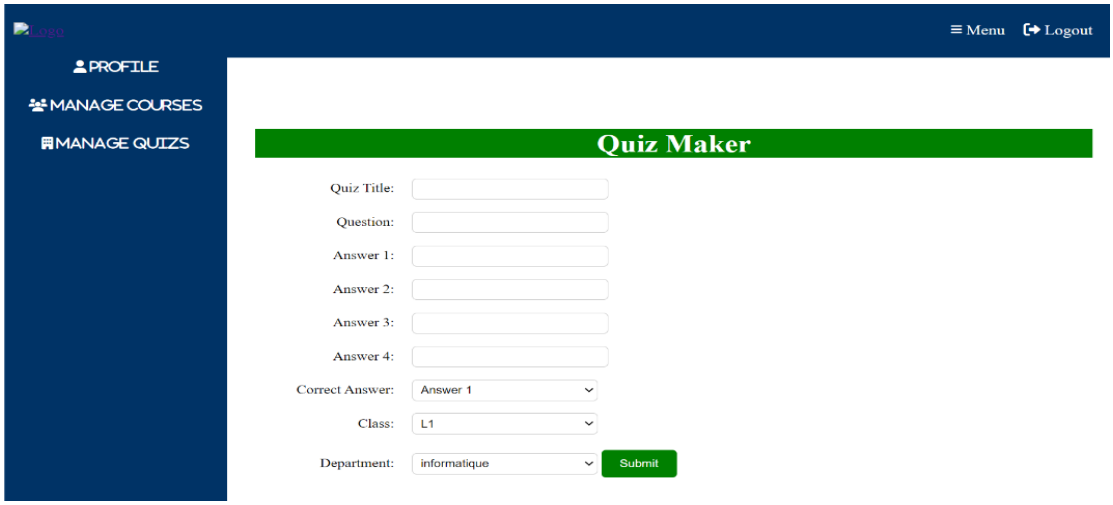


*Figure 20:Manage quizes*

## 6.10 Student dashboard

After the student logs in, then his interface appears. In this interface, the student must choose the department in which he is studying in order to be able to download his lessons or answer his quizes, as we see in the **Figure 21**.

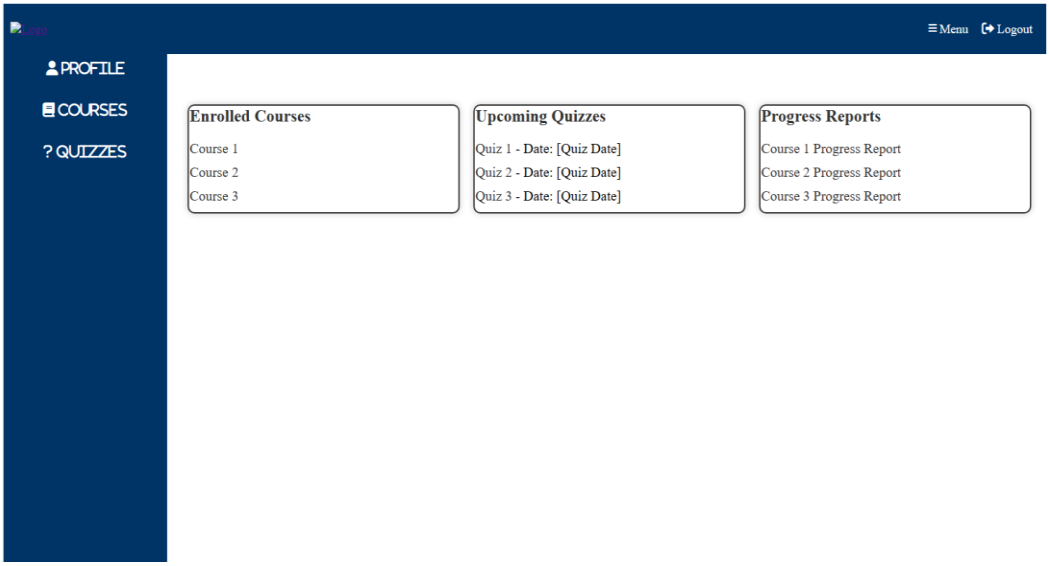


*Figure 21:Student dashboard*

## 6.11 List of courses for the student

If the student chooses his department, then his level, the interface of the lessons set by the teacher appears, where the title and description of the lesson appears, with the possibility of downloading it. See **Figure 22**


*Figure 22:Courses page*

## 6.12 List of quizes for the student

As previously with the list of lessons, it applies to the list of tests. The exam list interface appears to the student. He can choose a specific exam and answer it, and the result will be shown to him at the end. See **Figure 23**

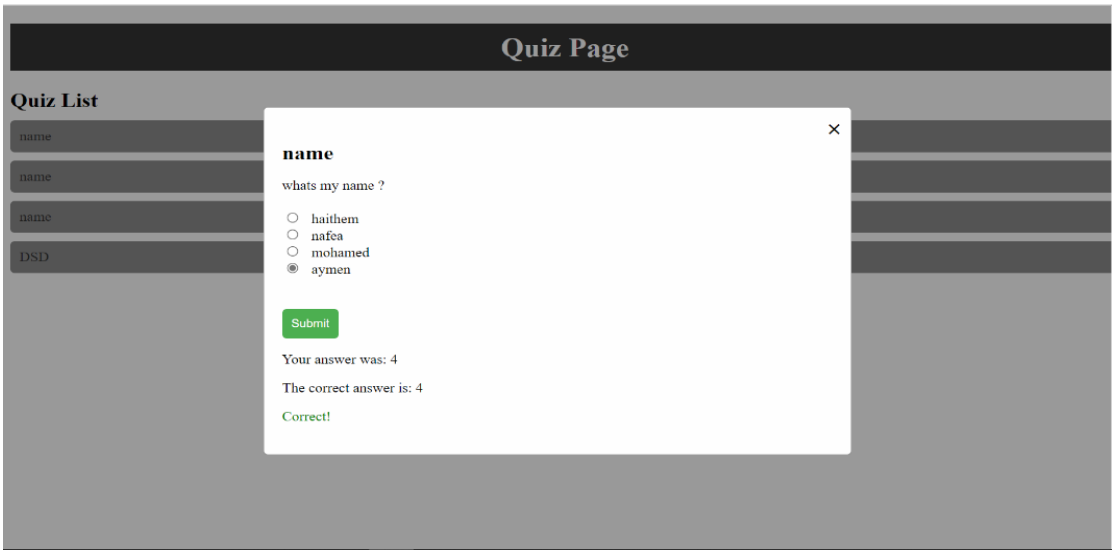


***Figure 23:Quizes page***

# 7. Conclusion

In this chapter, we tried to explain the tools and programing languages used, and the development environment, in addition to the work approach and the reasons for using each element. We also presented the most important interfaces of the site. Thus, we have reached the specific goal, which is to create an interactive site about distant learning.

# 8. General conclusion

Distant learning has been a popular alternative to traditional classroom learning for many years. It has proven to be more convenient, cheaper and learner-friendly mode of learning, and also provided an opportunity for students to learn at their own pace and convenience.

Our research has successfully developed a web application tailored to the needs of educators and learners in the context of distant learning. Through extensive research and implementation, we have achieved significant results and gained valuable insights into enhancing the e-learning experience.

The findings of this research highlight the importance of personalized learning experiences and the need to accommodate diverse learning styles.

We are committed to continuously improving our web application to ensure it meets the changing needs of users.

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## Abstract:

The goal of developing a site about studying about is to reduce the efforts of both teachers and students, and it can extend even to the administrative staff, as this goal was addressed and understood greatly during the period of the Corona pandemic, and this is what authorized us to choose to build this site. (Distant eLearning)


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## الملخص:

الهدف من تطوير موقع حول الدراسة عن هو تقليل الجهود من طرف كل من الاساتذة والطلبة كما انه بالإمكان ان يمتد حتى للطاقم الاداري، حيث تم التطرق لهذا الهدف وفهمه بشكل كبير في فترة جائحة كرونا، هذا ما خولنا لاختيار بناء هذا الموقع (التعليم عن بعد)