Palestine Technical University – Kadoorie

College of Engineering and Technology

Department of Computer Systems Engineering

Course name:

Software Engineering

Project title:

LEARNING PLATFROM FOR PTUK PROGRAMMING STUDENTS

BY:

Asma Salah – 202110133

Mais Sarhan – 202110972

Meerad Abdo – 202110774

Supervisor:

Dr. Nael Salman

Tulkarm, Palestine

27 May 2024

Acknowledgement

"O Allah, teach us what benefits us, benefit us from what You have taught us, and increase our knowledge. Glory be to You, we have no knowledge except what You have taught us. Indeed, You are the All-Knowing, the All-Wise",

The work was not easy, but with the cooperation of the team and staying up late nights to complete this project, Alhamdulillah, it was successfully accomplished. Thank you to everyone who contributed to this project, and special thanks to our project supervisor, Dr. Nael Salman,

To my comrades in the first and pre-last steps, to those who were a raincloud during the lean years, I am grateful.

ABSTRACT

The Project simply is a System of internet website that connects students with subjects they study in an easy way of interacting through friendly interface. Our main feature to introduce is grouping all subjects' materials in one easy-reachable place e.g., slides, exams, lectures, notebooks, and so on. Providing a system to control and rate every part of the site pages. In general, helping students to continue publishing courses materials and archive activities they do and reaching them via their profiles. In addition to find trustable updatable courses' stuff.

Contents

Chapter 1: INTRODUCTION

We have noticed that programming students at our university suffer from difficulty starting their educational career, especially programming students in the first year, and obtaining the correct and appropriate instructions and methods to start learning, as many of them are distracted and do not know where they are headed. When he turns to the Internet, he finds many sources that may not suit his current level, and he feels frustrated.

Hence the idea of our project appeared to facilitate the educational process and provide correct guidance instead of resorting to expensive courses and institutes, especially in light of our current circumstances, to enhance the learning experience and academic success.

Through this initiative, we will create a website specifically designed to meet the educational needs of students, especially in their early years.

To understand the specific needs and preferences of PTUK programming students , whether computer engineering students or even computer science students.

1.1 Purpose

The purpose of this document is to outline the software requirements for the development of an E-Learning Software System. It details the system's functionalities, performance, and constraints to provide a clear guide for developers, stakeholders, and project managers.

1.2 Objective

The main goal is to help students who want to learn programming, especially new students at Palestine Technical University - Kadoorie

The other objectives can be summarized as follows:

1. *Save time and effort for the learner by collecting many sources in one system*

2. *Structuring the learner's plan and giving him a study method that helps him*

3. *Focus on the needs of individual learners as an important factor in the education process and not on the needs of teachers or educational institutions*

4. *Include flexibility, convenience and self-paced learning*

1.3 Services

This system will provide a wide service that helps learning and studying for our university students or even for any student who wants to learn programming and feels that this plan suits him, as it will provide a complete educational plan that paves the way for them to start their professional lives, which will work in integration with the university's official website.

With the possibility of learning anywhere, keeping the learner informed of the latest technologies and events inside and outside Friday related to programming, and launching many additions with each release, which in turn will expand his horizons and make him overcome the boredom that the learner feels because he will be a guide on the way in an appropriate and renewed manner, and distance To avoid confusion and distraction due to the large number of sources, and to develop tests and questions so that the student

knows his level, the extent of his development, and a different sample of sources Using new creative methods of learning away from traditional learning methods

Here are some of these services

- provide User and Admin profile page.
- give Referential educational support
- Create a user classification system according to their academic year and level
- group all benefiting topics in one updatable place.

1.4 Stockholders

- The website will be useful for programming students at Palestine Technical University - Kadoorie, whether in the field of computer systems engineering or even computer science

- Or anyone whose plan is in line with ours and who wants to start learning programming, especially for first-year students, as they are most in need of a guide

- It will also be useful to some doctors who can benefit from ancient sources and develop them

- There may be some beneficiaries of people who are placed in charge of educational courses

- There are some students who can develop the website and make it a source of income

Chapter 2: METHODOLOGY, REQUERMENTS

2.1 System Description

It is a study website application designed to suit the needs and level of students, whether students of computer engineering or even computer science, for their years of study. In this section, we will provide a more detailed explanation of the nature of the site. It works in an integrated manner with the electronic system based on the LMS (Learning Management System).

The website will also provide interaction between students and the application so that students can learn independently. The user only needs a web browser to open the application on an Internet-connected computer, tablet or phone.

We will provide many features, the most important of which are user authentication and profiles, as students will be allowed to create accounts and log in securely.

Profile pages where students can update their information and preferences.

In addition to the home page, which will contain a search box to search for features on the site

In addition to the presence of a field related to events, events, and gatherings that will take place today at the university, or events related to programming.

The student will also specify his major and years of study so that the materials are appropriate for him

There will be a page for the proposed courses according to the years of study, and in each course there will be compiled and appropriate videos, whether from doctors' explanations or even from YouTube or different platforms.

In addition to a special slide for the topics that will be proposed in the course, and the questions, in addition to many other features that we discussed in the following sections.

2.2 Software Model

After studying the different models of software, we found that using more than one model and taking advantage of each type is the best for the website that we will create:

1. **Incremental development:** We will use this type of model for the general design of the system, so that the system will be developable, and we will issue several versions of it. We will add new features to the system, fix problems that the old version may suffer from, and add more appropriate courses and videos based on the opinions of users in the old version. Figure1 shows how this model works

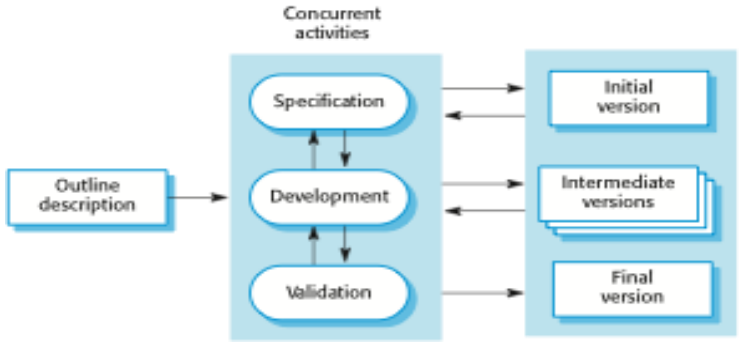


*Figure 1 : **Incremental model***

2. **Reuse-oriented software engineering:** This type of model was chosen because it takes advantage of many off-the-shelf features and will be developed to fit our system. So we will use it in every version we develop. There are many videos on the Internet and many features available on the Internet that can be taken advantage of, and the features will be chosen very carefully to suit the needs of the users and the level they have reached. Figure 2 shows how this model works

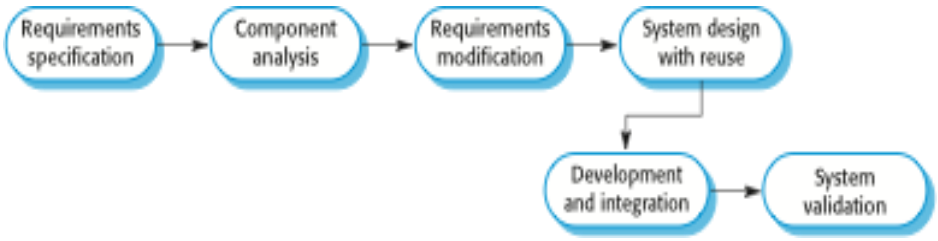


Figure 2: Reuse-oriented software model

- The general structure of the system is: **Incremental development**
- The structure assigned to each version in the system is: **Reuse-oriented software engineering**

The process used is :

We will use two types of operations.

1. **Plan-driven:** where we will determine the requirements as much as possible and prepare a pre-plan for each release

2. **agile processes:** may be some developments and requirements that will appear with us, whether in the current version or with different versions

2.3 Requirements

2.3.1 Functional Requirements:

1- Curriculum Structure:

The application should offer a curriculum with clear learning objectives for each lesson.

Lessons should be organized into modules with a logical progression.

2- Content Delivery:

Offer a structured curriculum with lessons on various programming fundamentals, concepts, and languages.

Lessons should be divided into modules with clear learning objectives.

Integrate multimedia elements like text, code samples, and quizzes.

2.3.2 Non Functional Requirements

1- Performance and Scalability:

The application should load quickly and remain responsive even with a large number of concurrent users.

The system should be scalable to accommodate future growth in user base and content.

2- Portability and Compatibility:

The application should be accessible on a variety of devices (desktop, mobile, tablets) with different operating systems (Windows, macOS, Android, iOS).

The code editor should be compatible with popular programming languages.

3- Reliability, Maintainability, Availability:

The application should function reliably with minimal downtime or errors.

The code should be well-documented, modular, and easy to maintain for future updates and bug fixes.

The application should be highly available with minimal disruptions to user access.

4- Usability:

The application should have a user-friendly interface that is intuitive and easy to navigate, so we will try to explain things and their use clearly.

5- Security

is one of the most important features, as no one can make modifications to the site, protect it using different methods, and ensure that each person has his own page by logging in and out.

2.4 Design

The design stage is considered one of the important stages that constitutes an attraction factor for everyone who enters the site. Therefore, we made sure to choose comfortable colors so that the user's eyes do not get tired while using the application, in addition to making it take on a modern, youthful character that gives users energy when using the application. Therefore, we chose the black color that is popular with all young people

We made sure that the quality of the application was appropriate. Whether on computer or mobile, because web applications combine both systems, we value our users very much, so if there are any problems in the design, they will be modified in the next versions that will be launched.

2.5 Validation & Testing

The testing stage is one of the important stages. In this step, we will conduct successive tests for each feature that we will add and make sure that it works well, and if there is a problem, it will be modified.

Then we will conduct a test to add this feature to the system and ensure that this feature is consistent with the system as a whole

2.6 Evolution

- implementing a gamification system with badges, leaderboards, and rewards to motivate users .

- Allow users to save their code for revisiting past challenges and tracking progress.

- Explore integrating a forum or chat system to facilitate discussions and collaborative learning among users.

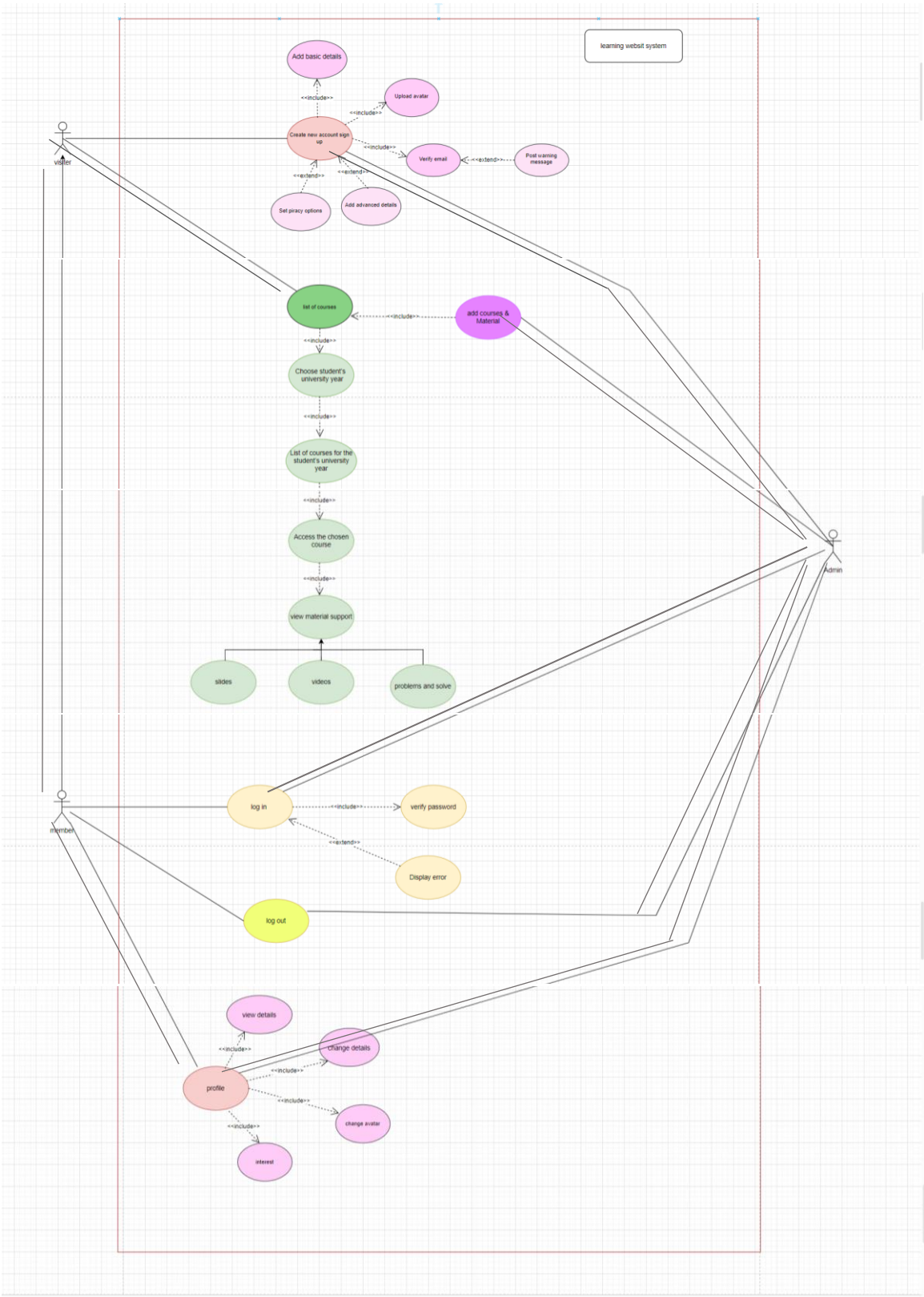
- Increase the number of materials to include educational materials for young children

- Adding slides and books translated into Arabic

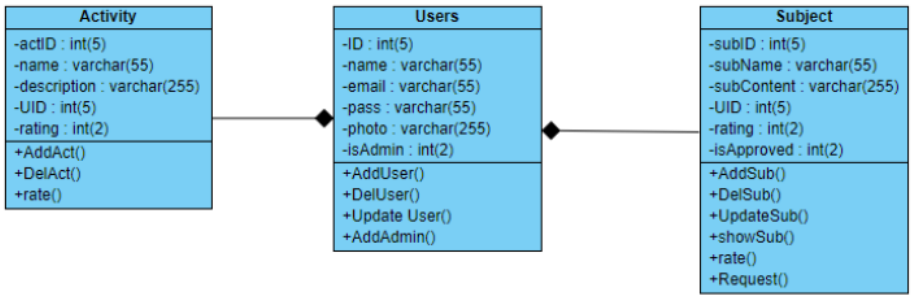
Chapter 3: SOFTWRE DIAGRAMS:

3.1 Use Case Diagram

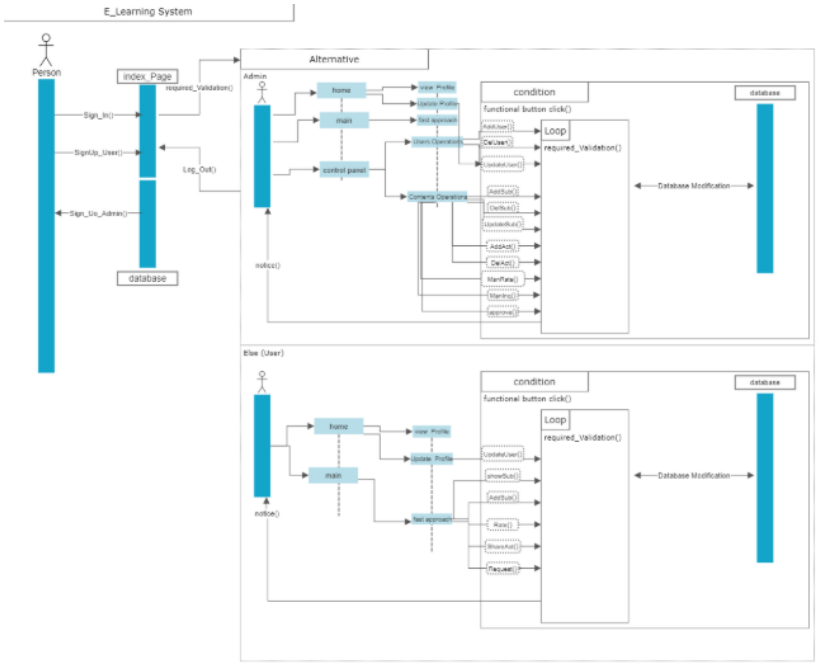
3


learning websit system
Add basic details
Upload avatar
<<include>>
Create new account sign up
Verify email
Post warning message
<<extend>>
Set piracy options
Add advanced details
visiter
list of courses
add courses & Material
Choose student's university year
List of courses for the student's university year
Access the chosen course
view material support
slides
videos
problems and solve
Admin
member
log in
verify password
Display error
log out
view details
Change details
profile
change avatar
interest

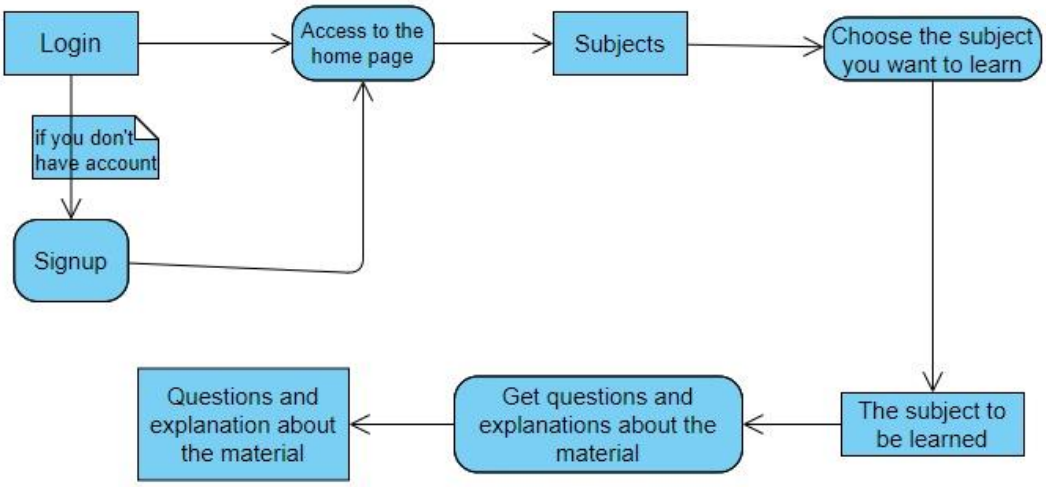
3.2 Class Diagram



3.3 Sequence Diagram



3.4 Activity Diagram



Chapter 4: IMPLEMENTATION

In this part, we will talk about the implementation section we did in the project to create the initial version that contains the basic components that can be developed in future versions that will be produced in the long term.

We initially distributed the tasks related to the project diagrams: Asma implemented the sequence diagram and activity diagram, Mais implemented the use Test case modeling, and Merad implemented the class diagrams.

Then we chose a modern, unique and attractive design and we chose the color black because we found that most students feel comfortable and prefer this color, in addition to choosing a background suitable for the topic, a beautiful background that combines comfort and energy.

Then we distributed the basic tasks. Mais created the home page with all its details, Asmaa implemented the login page, and Merad the registration page, and they were implemented using HTML, CSS, and JS.

After completing this task, new tasks related to more important aspects were distributed. I implemented the basic interface names for the C++ page, Mais created the inner page related to the C++ level, while Merad designed the IF and Vector page with its inner contents of slide, video, and question for each page.

We'll upload the files using git and GitHub, compile them into a single project, and then upload them to the server until they're ready to use and test.

During implementation, we took into account different types of devices. So the user can access the web page using a computer, tablet or smartphone to facilitate communication

During implementation, we used different techniques as we explained in the course, such as distributing tasks according to the capabilities of team members.

Note: This is a preliminary release, and since we are working on an incremental development system, we may take this model in the future and develop it and release several versions, with the hope that this system will be a kernel for other people.

We will take advantage of many features available online and elsewhere and make use of them to suit our system and meet the needs of users.

Note: This is an initial release, and since we are working with a **Incremental development** system, we may in the future take this model, develop it, and issue many versions, hoping that this system will be the nucleus for other people.

These links are for the practical part.

- the code

  https://github.com/MaisSerhan/SoftWar1

- the website link

  https://liveexperiance-maisserhans-projects.vercel.app/

4.1 User Interface

Here some of user interface page

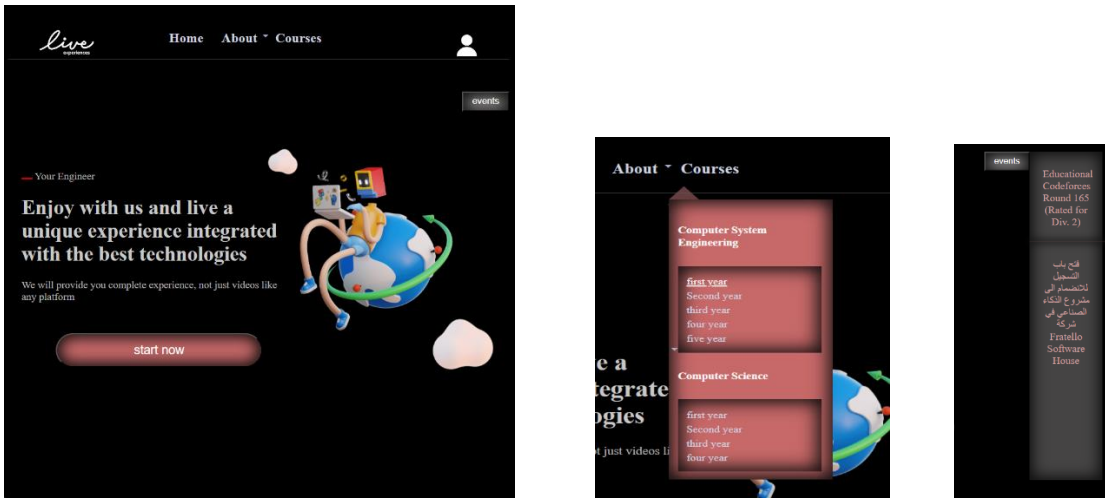
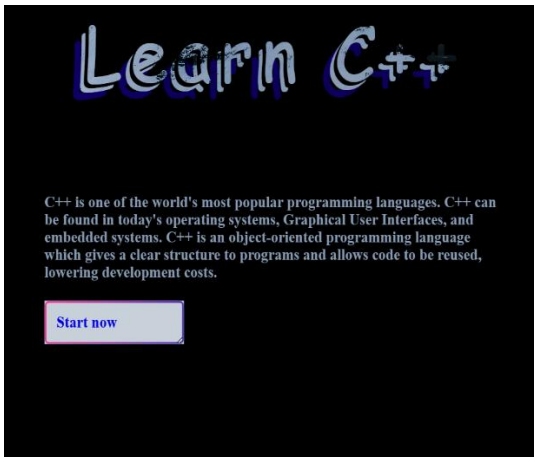


Figure 3 home page

Click on fist year to show courses in first year of computer Systems Engineering

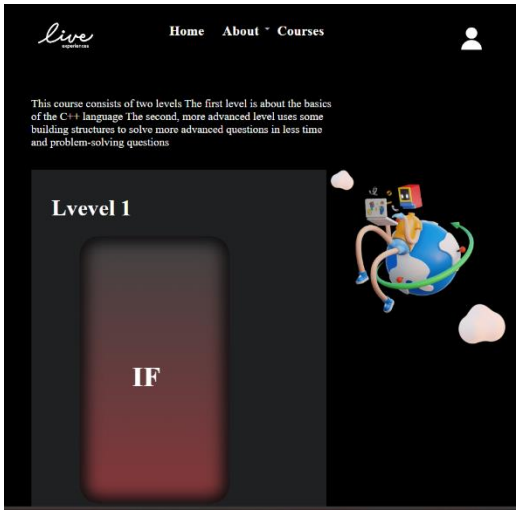
Click on event to show recent event in programming

You can scroll in home page to show more beautiful and useful thing in programming



Click on start now to show level of C++ courses

Figure 4 list of courses for first year in Computer system engineering



Click on if to show if page contant

Figure 5 levels of C++

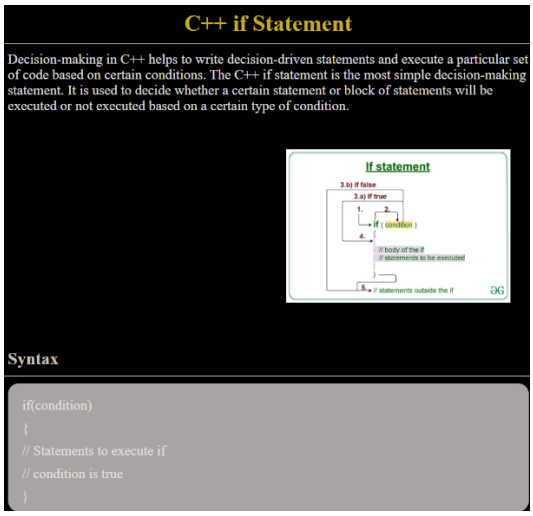


Figure 6 if page level 1 of C++

To show more details you can click one this link

https://liveexperiance-maisserhans-projects.vercel.app/

4.2 Conclusion

implementation of an e-learning platform system offers numerous advantages, making it a valuable asset for educational institutions and learners alike. This digital approach to education enhances accessibility, allowing students from diverse geographical locations to access high-quality learning materials and resources. E-learning platforms facilitate personalized learning experiences, catering to individual needs and learning paces, thereby improving overall educational outcomes.

Furthermore, these platforms promote continuous learning and skill development, which are crucial in today's rapidly evolving job market. The integration of interactive tools, multimedia content, and collaborative features enhances student engagement and fosters a more dynamic learning environment. Additionally, e-learning platforms offer scalability, enabling institutions to efficiently manage large numbers of students and courses.

Chapter 5: TEAM MEMBER WORK

5.1 Distribution of tasks

First part of Work

Team Member	Work
Asma	Requirements, Introduction, Services
Mais	Software model, Design, Implementation
Merad	Testing, System Description, Objective

Second part of Work

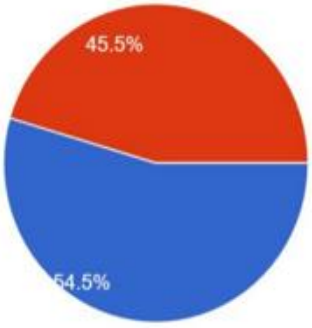
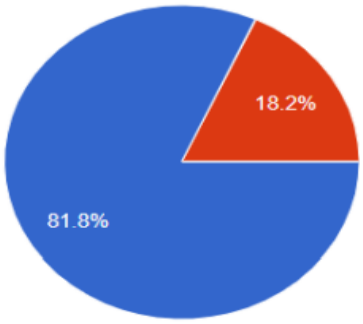
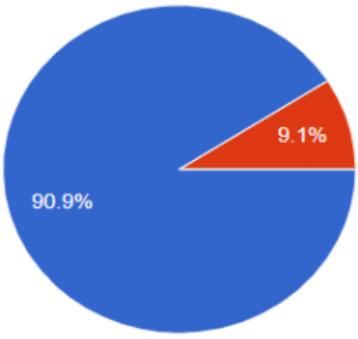
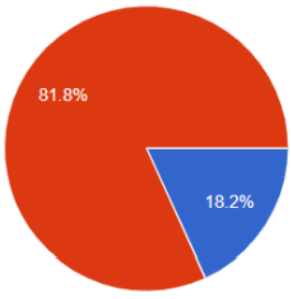
This initial plan was distributed in this way because we want to give everything an appropriate time according to our discretion and it will also give an initial overview and general structure of the application.

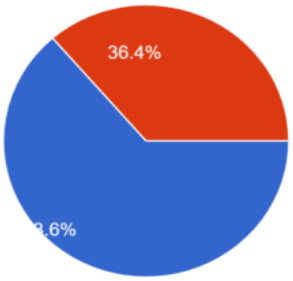
This plan is distributed over 3 weeks from 5 May to 23 May.

	First week					Second week					Third week				
Day in May	**5**	**6**	**7**	**8**	**9**	**12**	**13**	**14**	**15**	**16**	**19**	**20**	**21**	**22**	**23**
Asma	**sequence diagram**					**activity diagram**		**Login page**			**C++ main page**		**modify SRS**		**Project delivery**
Mais	**Test case modeling**					**Home page**					**C++ level page**				
Merad	**class diagrams**					**Sign up page**		**If page**			**Vector page**				

5.2 Survey

We conducted a survey to see how important it was to present our idea and how students responded to it, and these were the results of the survey

الاسئلة	نتائج
هل تعتقد ان التعليم عن بعد يعد أسلوبا مناسبا لتلبية احتياجاتك التعليمية	
هل تواجه صعوبة في اختيار المصدر الافضل لتعلم البرمجة ؟	
هل تشعر بضرورة وجود منصة الكترونيه او مساعد يرشد الطريق لك	
هل ترى ان مصادر الجامعة كافيه من اجل ان تصبح جيدا بالبرمجة ؟	

	هل لديك معرفه سابقة بالبرمجه ؟

5.3 Reference

- Ian Sommerville (2016). Software Engineering. 10th edition, Boston et al, New York
- Gerhard Krüger & Charles Lane (2023). How to Write a Software Requirements Specification (SRS Document). Retrieved from How to Write a Software Requirements Specification (SRS) | Perforce
- Ravi Bandakkanavar (2023). Software Requirements Specification document with example. Retrieved from https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database?fbclid=IwAR0N3iY2VlYXGkcKLMQvJeVnhGdghIL6AFpZ7wuRQH8KvU6RAOaux951fzc_aem_AWHO8K-lD89_H-s_Ixjx6ee-Gfs3GMoFmZ4_tMJcXjj3LnYMtRBftJum_t9cIgP2TAZ1ifYnu2LGRl8Uspg5QWsO