Peoples Democratic Republic of Algeria

Ministry of Higher Education and Scientific Research

AKLI MOHAND OULHADJ UNIVERSITY of BOUIRA

Faculty of Sciences and Applied Sciences

Computer Science Department

License memory

In Computer Science

Specialty: *ISIL / SI*

Theme

Computer Architecture Interactive Course Website

Supervised by

- DR. TAHA ZERROUKI

Realized by

- GRINE Lyes

- LAMRI Farouk

- MIDOUN Mohamed

2021/2022

Acknowledgement

Dedications

First, I would like to dedicate this work to the most important people in my life, to the ones who supported me and guided me diligently throughout this work and throughout my whole life, to my mother and my father. I also dedicate this work to my brother and sisters, and of course to my team, Farouk and Mohammed, with whom I was able to accomplish this work.

Grine Lyes

Dedications

I dedicate our work to my family and many friends. A special feeling of gratitude to my loving parents whose words of encouragement and push for tenacity ring in my ears. My Brothers SIDALI and ABD EL MONEIM have never left my side and were very special. I also dedicate this project to my many friends and university's family who have supported me throughout the process. I will always appreciate all they have done, especially AZZEDINE MOULAI for helping me develop my skills, NOUREDDINE and HITHEM for the many hours of study adventures, and IMAD KHIDER and OUSSAMA for sharing an amazing academic years. DR. TAHA ZERROUKI – I would like to thank you for your support and encouragement to pursue this work. Thank you for all the academic help you have provided me with throughout the last three years at UAMOB. I dedicate this work and give special thanks to my best friends LYES GRINE and MOHAMED MIDOUN for being there with me and sharing this entire Bachelor's degree program. Both of you have been my best companions.

Lamri Farouk

Dedications

My dedications go particularly to my dear parents, as well as my family, And everyone who helped me to reach this level of success achieved, Docent Professor Taha Zerrouki our guide in this Pleasant work, and my Duo Ilyes Grine and Farouk Lamri, also every Colleague involved directly or indirectly. Not to forget everyone who encouraged me to go all the way long Along with a lot of respect to every employee at the University of AMO.

Midoun Mohamed

r

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Key words: Internet, Web, Database, . . .

Abstract

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Key words: Internet, Web, Database, . . .

Résumé

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Mots clés: Internet, Web, Base de données, . . .

Contents

List of Figures

List of Tables

Abreviations list

RWD	Responsive Web Design
IC	Interactive Course
MI	Math and Computer Science
AMO	AKLI MOHAND OULHADJ university
STRM	Computer Architecture or Structure Machine
UML	Unified Modeling Language

General Introduction

As students of the

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Preliminary study

1.1 Introduction

In this chapter we will go over some general definition, study of the existing and analysis of existing applications. All about the topic of computer architecture in the form of an interactive course.

1.2 General Definitions

1.2.1 Computer Architecture

In general

Computer architecture is a science or a set of rules stating how computer software and hardware are joined together and interact to make a computer work. It not only determines how the computer works but also of which technologies the computer is capable.[1]

In our case

Computer architecture or better known as "Structure Machine"(STRM) is a course for first-year students in the Math and Computer Science department (MI) of the university Bouira AMO. and also in all the MI departments in Algeria universities.

Computer architecture (STRM) has a coefficient of 3 and a credit of 5, which makes it one of the more fundamental courses.[2]

1.2.2   Interactive Course

The term "Interactive Course" (IC) typically describes material of an educational nature delivered in a format which allows the user to directly impact the materials content, and out-come. An example of such material would be a computer based presentation requiring a user to select the correct answer to a give question before proceeding to the next topic. These types of courses are almost always computer based and most likely to be delivered to the user thru the internet. Due to their convenient delivery, availability and almost endless subject matter, interactive courses have become a major tool for those seeking to provide as well as those seeking to obtain education, training or certification in a given area of study.[3]

With growing access and availability to computers and the internet, many schools, universities, businesses and government agencies are turning to IC's to train and educate their students and staff.[3]

1.2.3   Responsive Web Design

Responsive web design (RWD) is a web development approach that creates dynamic changes to the appearance of a website, depending on the screen size and orientation of the device being used to view it. RWD is one approach to the problem of designing for the multitude of devices available to customers, ranging from tiny phones to huge desktop monitors.[4]

1.2.4   Website

A website is a collection of publicly accessible, interlinked Web pages that share a single domain name. Websites can be created and maintained by an individual, group, business or organization to serve a variety of purposes.[5]

1.3 Study of the existing

We did go over the definition of computer architecture in a general sense and in our context of study(STRM), so in this part we will go more in-depth about the structure of the computer architecture(STRM) course (see Figure 1.1), and which resources we will be basing our own study of the course from.

1.3.1 Structure of the computer architecture course

The structure of the STRM course (see Figure 1.1) was fully based from our study of the STRM 1 Book[6], and the MI official program[2].
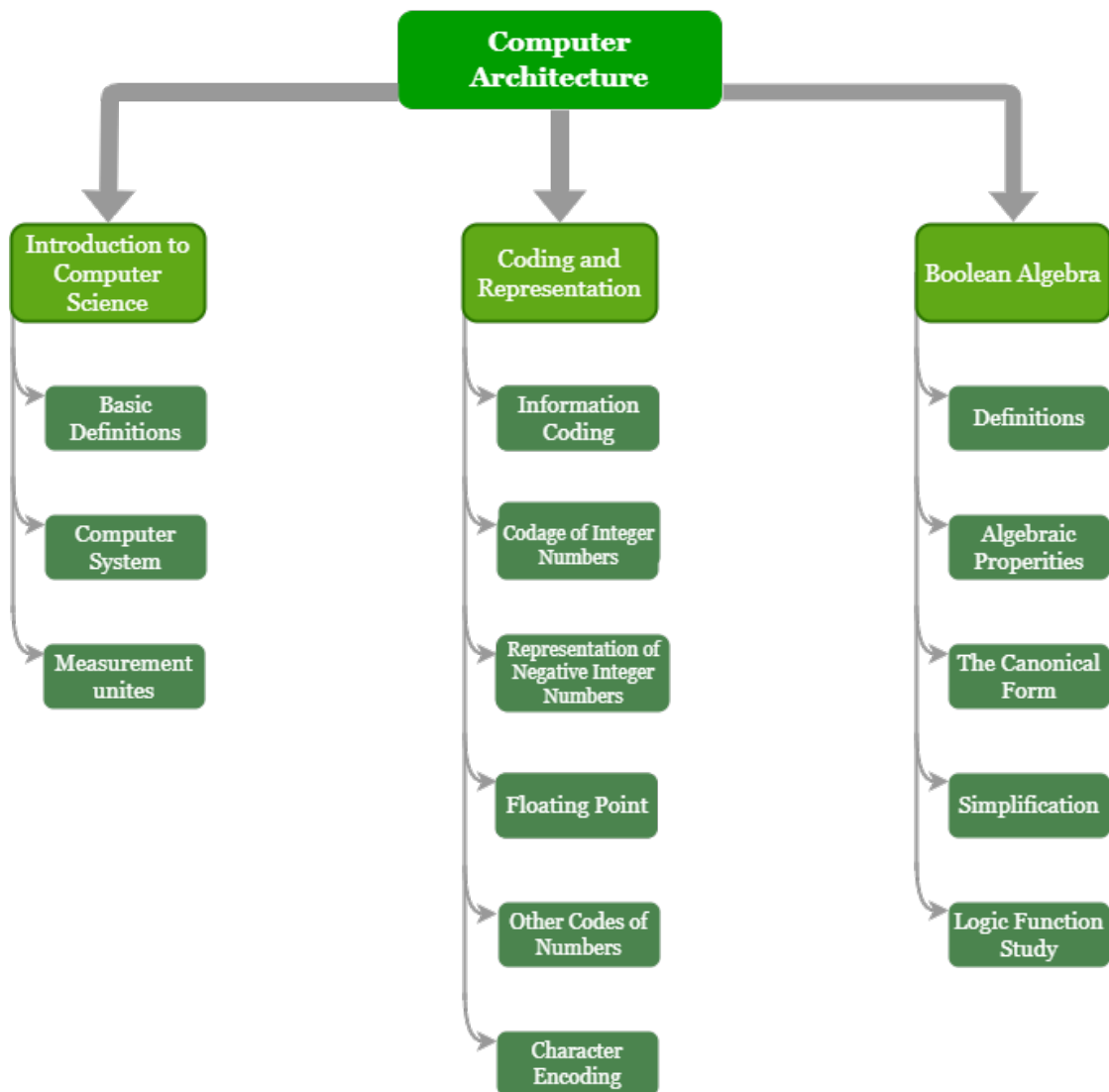

Figure 1.1: Structure of STRM

1.3.2   Computer architecture course

There exists some books that cover the course of computer architecture, and based on our experience as students of the MI department that has already studied this course we would like to mention the following :

Digital Design and Computer Architecture

This book by David Harris and Sarah Harris is designed for courses that combine digital logic design with computer organization/architecture or that teach these subjects as a two-course sequence. Digital Design and Computer Architecture begins with a modern approach by rigorously covering the fundamentals of digital logic design and then introducing Hardware Description Languages (HDLs). By the end of Digital Design and Computer Architecture, readers will be able to build their own microprocessor and will have a top-to-bottom understanding of how it works–even if they have no formal background in design or architecture beyond an introductory class. [7]

STRM 1 Book

This book by Dr. Taha Zerrouki is a lessons and solved exercises focus, intended for first-year students of mathematics and Computer Science department (MI) in Algerian universities.[6]
It contains in this part the lessons of the first semester:

- Interoduction to computer science.

- Coding and representation of information.

- Boolean Algebra.

The book contains a large number of exercises divided according to chapters, a large part of it is solved, as well as a special section for continuous assessment examinations with Correction, and another section for exams. This book comes as a result of the experience that Dr Taha gained in teaching at the University of Bouira for many years in the Department of Computer Science. The book is also bilingual, with lessons in French and translated into Arabic, in order to help new students who suffer from a language barrier in their college start. [1]

---

[1]We will be focusing our study of the course on the STRM 1 book [6]

1.4 Analysis of existing applications

A very important part in developing a new project in the domain of computer science is looking for and analyzing already existing solutions to the project you are working on, in our case the project is making an **Interactive Course For Computer Architecture**. if there is no already existing solutions you would look for solutions that are somehow related (similar) to the project at hand.

In our case and as far as our search goes there are no already existing solutions(neither apps nor websites), but there exists some tools, websites and mobile apps that are somewhat related to our project. like:

1.4.1 STRM Tests

This tool was build by Dr. Taha Zerrouki to generate and create random tests for computer architecture 1 (STRM 1) - first year MI in Algerian universities.[8] the features of the **STRM Tests** tool[8] are:

- Generate checks and questions with solutions.

- Supports the following classes:

  1. Enumeration systems.

  2. Representation of natural and real numbers and letters.

  3. Encoding information.

  4. Boolean algebra.

- Generate answers:

  1. Possibility to draw a logical function diagram.

  2. Generate Karnough tables with solution.

  3. Generating graphic solutions to Karnough's table.

- Generate duplicate forms of questions for easier typing.

- Random generation of questions.

1.4.2   CS301 Computer Architecture

Saylor Academy is a nonprofit initiative working since 2008 to offer free and open online courses to all who want to learn. They offer nearly 100 full-length courses at the college and professional levels, each of which is available right now . Modern computer technology requires an understanding of both hardware and software, since the interaction between the two offers a framework for mastering the fundamentals of computing. The purpose of this course is to cultivate an understanding of modern computing technology through an in-depth study of the interface between hardware and software. In the CS301 Computer Architecture course you will study the history of modern computing technology before learning about modern computer architecture and a number of its essential features, including :

- Instruction sets

- Processor arithmetic and control

- The Von Neumann architecture

- Pipelining, memory management, storage, input/output

The course will conclude with a look at the recent switch from sequential processing to parallel processing by looking at the parallel computing models and their programming implications.[9]

1.4.3   BooleanTT

This is a simple and easy-use app developed by Hashan Chamara Rajapaksa to :

- Simplify/Minimize Boolean expressions

- Solve Karnaugh maps

- Generate Truth-Tables of Boolean expressions

- Generate Min Terms and Max Terms from Truth-Table easily

- Check logic circuit

And also it will help you learn about basic logic gates theories.[10]

1.4.4 DecToBin

This application is developed by Kyssnar, it allows you to encode numbers in base 10 to different formats of binary coding:

- IEEE 32 and 64 bits

- One's and Two's Complement

- Binary Code Decimal

- Excess to N

- Excess to N - 1

- Signed Magnitude

- Simple and double precision

Also includes a binary calculator that can add, subtract, multiply and divide in binary and show results in binary and decimal.[11]

1.4.5 Summary

We summarized the previous study in this Table 1.1.

	Courses			Tests		
	Intro CS	Code Reprsnt	Bool Algebr	Intro CS	Code Reprsnt	Bool Algebr
STRM Tests				X	X	X
CS301	X	X	X			
BooleanTT			X			X
DecToBin					X	

Table 1.1: Analysis of existing summary table

1.5   Conclusion

We have done an analytical study and found a solution to the problem at hand, and we have studied the existing parial solutions to try and combine them for a better solution, and in order to be able to identify the functional and non-functional requirements of the application we seek to design, and we will present the adequat conception and modeling.

Chapter 2

Conceptual study

2.1 introduction

This chapter describes a very important part which is the conceptual study and an analytical look in addition to the base design.

This part define the basic steps for developing our system where specifying functional and non-functional requirements using the concepts of Unified Modeling Language (Use Case diagram, Sequence diagrams, and Class diagram), and clarify the goal of this analysis and design all about the topic of computer architecture in the form of an interactive course.

2.2 Graphic design

2.2.1 Modeling

Modeling uses graphic notation to create visual models of software systems, the use of diagrams and illustrations makes something complex more understandable, that's why Unified Modeling language (UML) [12] is a standardized modeling language enabling developers to specify, visualize, construct and document artifacts of a software system. Thus, UML makes these artifacts scalable, secure and robust in execution. It is an important aspect involved in object-oriented software development.

11

2.2.2   Definition of Unified Modeling language

The Unified Modeling Language (UML) is a general-purpose, developmental, modeling language in the field of software engineering that is intended to provide a standard way to visualize the design of a system.[13]

The creation of UML was originally motivated by the desire to standardize the disparate notational systems and approaches to software design. It was developed at Rational Software in 1994–1995, with further development led by them through 1996.[13]

In 1997, UML was adopted as a standard by the Object Management Group (OMG), and has been managed by this organization ever since. In 2005, UML was also published by the International Organization for Standardization (ISO) as an approved ISO standard. Since then the standard has been periodically revised to cover the latest revision of UML. In software engineering, most practitioners do not use UML, but instead produce informal hand drawn diagrams; these diagrams, however, often include elements from UML.[13]

2.3   Specification and needs analysis

2.3.1   Basic functions of the application

The main requirements which are specifically related to the behavior and functions of the system can be summarized in the following points :

1. Interactive course with practical examples.

2. Fun Quiz and testing what the user has learned.

3. Practical models for machine structure tests.

2.3.2   Non-functional needs

These are the most important major requirements not specifically related to the behavior of the system but rather the identification of internal and external constraints of the system :

Ergonomic interfaces

The solution must present an ergonomic interface encompassing all the functionalities. The manipulation of the interface should not require advanced computer knowledge, it must be simple and clear in order to adapt to the computer knowledge of the users.

Reliability and speed

The system must guarantee the speed and reliability of the search for information, as well as optimal management of resources.

The code

Must be clear to allow future evolutions or improvements.[14]

2.4   Detailed design

2.4.1   Use Case diagram

Use Case Diagram describes functionality of a system in terms of actors, goals as use cases and dependencies among the use cases.[12]

System

Interactive Course For Structure Machine 1.

Actors

Specify a role played by a user or any other system interacting with the subject.[12]

Use cases

describes functionalities of the system .In this system :

1. COURSE : When user click on COURSE he can see the whole CHAPTERS of the course, when he click on try in each TITLE of CHAPTERS a question window will apear with a specific type of question depends on the chapter's TITLE.

2. QUIZ : When user click on QUIZ he can test what he learned in this course with a specific Options (choose chapters and number of questions), when clicking on start a question window will apear.

3. TEST : When user click on TEST he will find a practical models for machine structure tests including the whole course.

Relations

1. INCLUDE : (QUIZ and Options),(Options and Question),(TEST and Question).

2. EXTENTION : the rest of use cases.

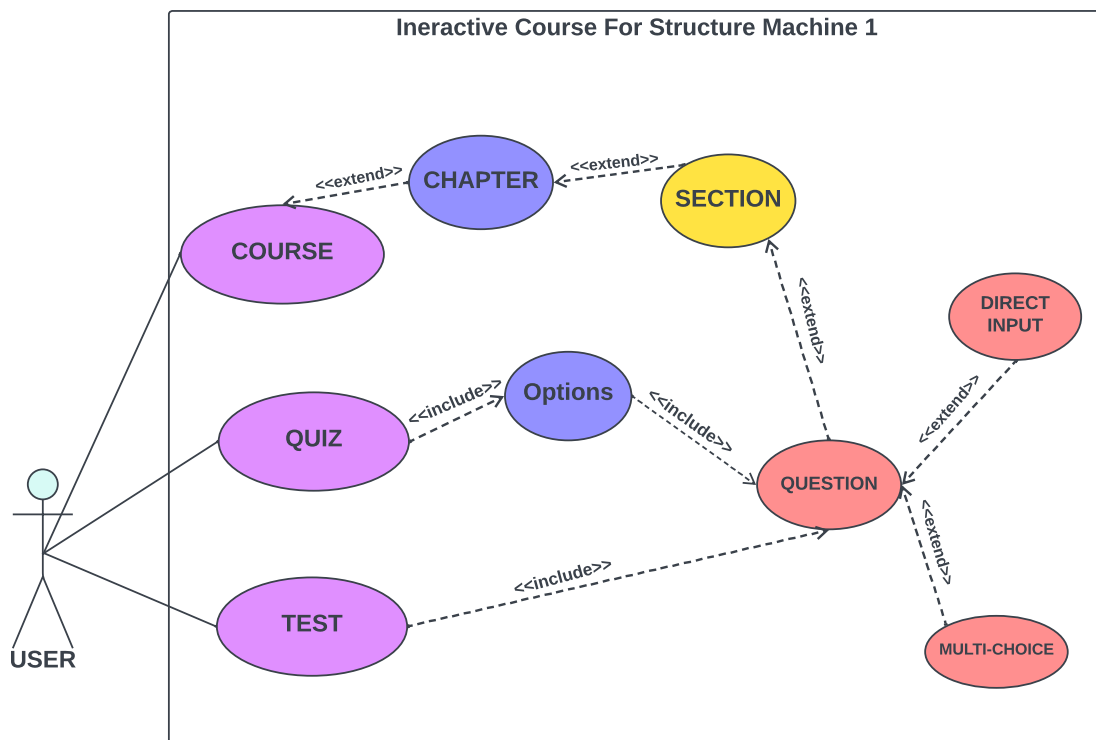The figure 3.12 represents this system's Use Case Diagram.

Figure 2.1: Use Case diagram.

2.4.2   Sequence diagrams

A sequence diagram, in the context of UML, represents object collaboration and is used to define event sequences between objects for a certain outcome, it is an essential component

used in processes related to analysis, design and documentation.[15]

A sequence diagram is also known as a timing diagram, event diagram and event scenario.[15]

2.4.3 COURSE

This first scenario shows how user can see the whole CHAPTERS of the course, and try a question with a specific type depends on the chapter's TITLE.

Identication summary	
Use Case Title	COURSE.
Abstract	User learn course.
Actor	User.
Identication summary	
Preconditions	Accessible system.
User exists	The purpose of this system is navigate and learn from the course.
Scenario	1- User clicks on Course button. 2- System loads all chapters. 3- System shows the chapters. 4- User chooses chapter. 5- System loads sections of chapter. 6- System shows the content of sections. 7- User clicks on Try. 8- System sends SQL request (Select section's question) to DataBase. 9- Database return data(section's question). 10- System loads results. 11- System shows results.
Object	User learn the course with live examples.

Table 2.1: Text Description of Use Case "COURSE".

The figure 2.2 represents COURSE Sequence diagram.

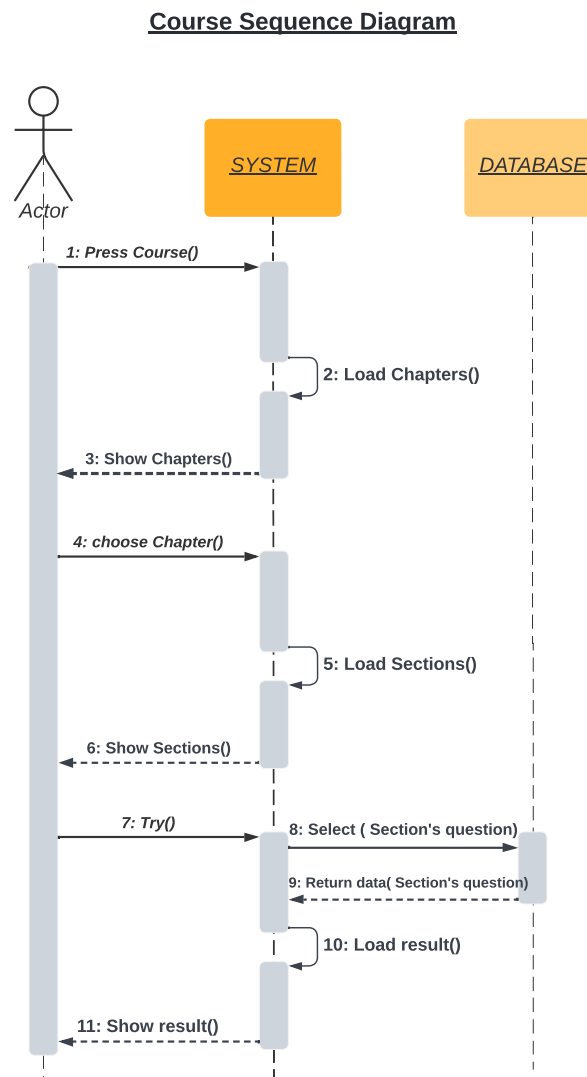**Course Sequence Diagram**

Figure 2.2: COURSE Sequence diagram.

2.4.4 QUIZ

This second scenario shows how user can test what he learned in this course with a specific options (choose chapters and number of questions).

Identication summary	
Use Case Title	QUIZ.
Abstract	User takes a quiz.
Actor	User.
Identication summary	
Preconditions	Accessible system.
User exists	The purpose of this system is taking a quiz.
Scenario	1- User clicks on Quiz button.
	2- System loads Options.
	3- System shows Options.
	4- User chooses options.
	5- System shows Start button.
	6- User clicks on Start button.
	7- System sends SQL request (Select Questions) to DataBase.
	8- Database return data(Questions).
	9- System loads Quiz results.
	10- System shows Quiz results.
Object	User can take a quiz with any options he wants.

Table 2.2: Text Description of Use Case "QUIZ".

The figure 2.3 represents QUIZ Sequence diagram.

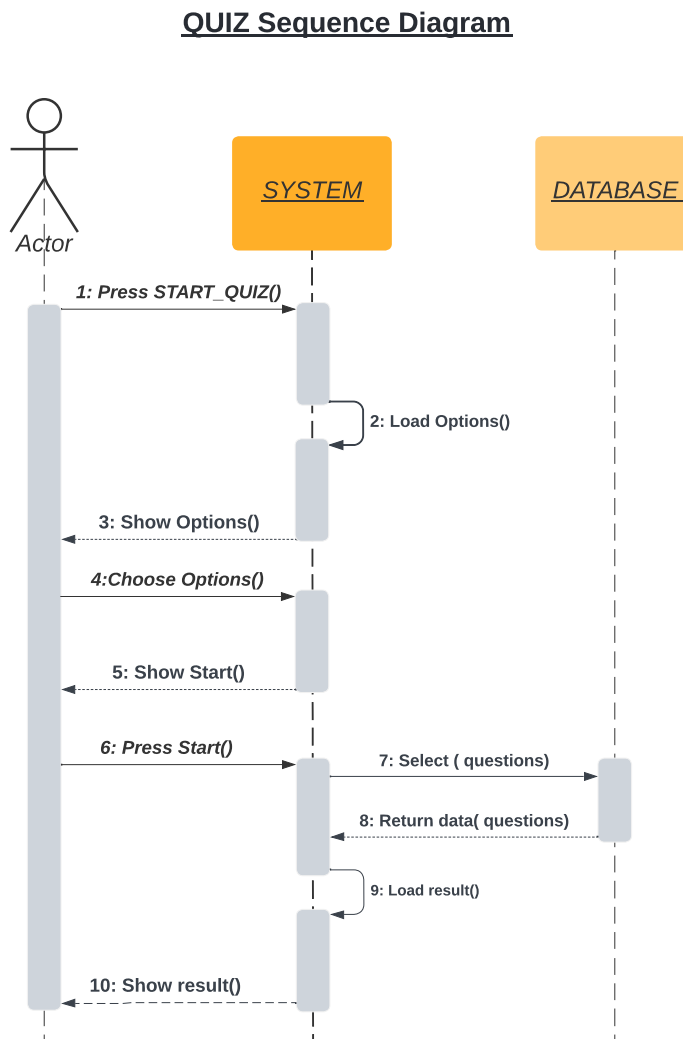**QUIZ Sequence Diagram**

Figure 2.3: QUIZ Sequence diagram.

2.4.5 TEST

This third scenario shows how user can find a practical models for machine structure tests including the whole course.

Identication summary	
Use Case Title	Test.
Abstract	User takes a Test.
Actor	User.
Identication summary	
Preconditions	Accessible system.
User exists	The purpose of this system is taking a Test.
Scenario	1- User clicks on Test button.
	2- System shows Start button.
	3- User clicks on Start button.
	4- System sends SQL request (Select Question from each chapter) to DataBase.
	5- Database return data(Question from each chapter).
	6- System loads Test results.
	7- System shows Test results.
Object	User can find a practical models for machine structure tests including the hole course.

Table 2.3: Text Description of Use Case "TEST".

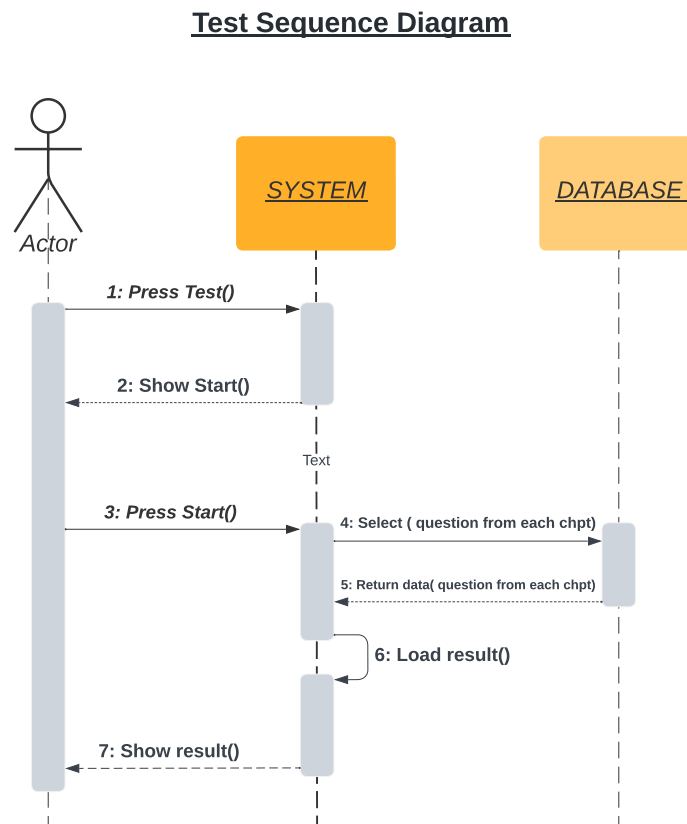The figure 2.4 represents TEST Sequence diagram.

Test Sequence Diagram

Figure 2.4: TEST Sequence diagram.

2.4.6   Class Diagram

A class diagram is a type of diagram and part of a unified modeling language (UML) that defines and provides the overview and structure of a system in terms of classes, attributes and methods, and the relationships between different classes. [16]

It is used to illustrate and create a functional diagram of the system classes and serves as a system development resource within the software development life cycle. [16]

Why Class Diagram?

A class diagram is primarily designed for developers to provide the conceptual model and architecture of the system being developed. Typically, a class diagram consists of more than one class or all the created classes for a system. [16]

It is a type of structure diagram and looks similar to a flow chart having three main parts illustrated in rectangular boxes. The first or top part specifies the class name, the second or middle specifies attributes of that class and the third or bottom section lists the methods or operations that specific class can perform. [16]
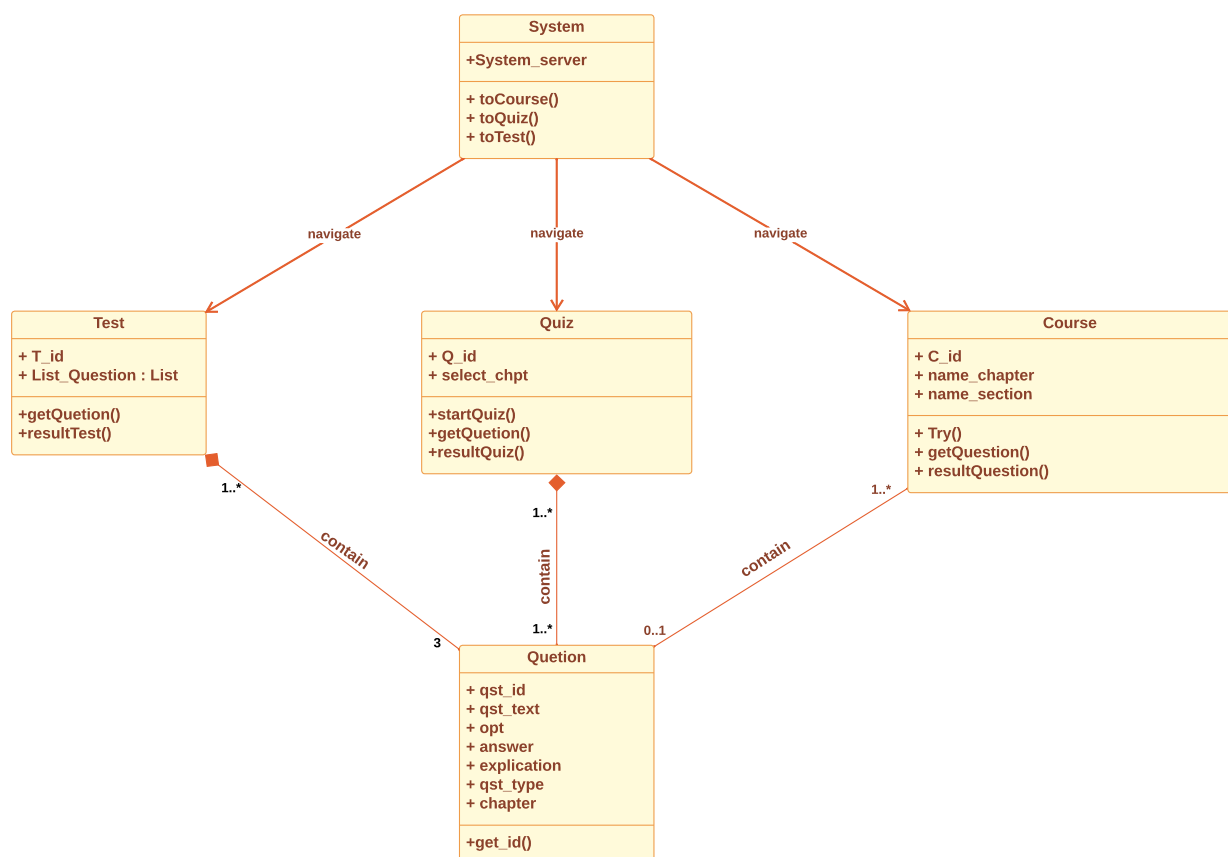
The figure 2.5 represents this system's Class Diagram.

Figure 2.5: Class Diagram.

The table 2.4 represents classes and attributes as well as their types and description .

Class	Attributes	Description	Type
System	System-server	system's identificator.	Digital
Course	C-id	Course identificator.	Digital
	name-chapter	Chapter's name.	Alphabetic
	name-section	Section's name.	Alphabetic
Quiz	Q-id	Quiz identificator.	Digital
	select-chpt	Choosing chapter.	Digital
Test	T-id	Test identificator.	Digital
	List-Question	List of questions.	Alphabetic
Question	qst-id	Question identificator.	Digital
	qst-text	Questions text.	Alphabetic
	opt	Questions options.	Alphabetic
	answer	Questions answer.	Alphabetic
	explication	Answer explication.	Alphabetic
	qst-type	Questions type.	Alphabetic
	chapter	Chapter's number.	Digital

Table 2.4: Description of Class Diagram.

Database's Class Diagram

The figure 2.6 represents the database in the form of a class diagram.
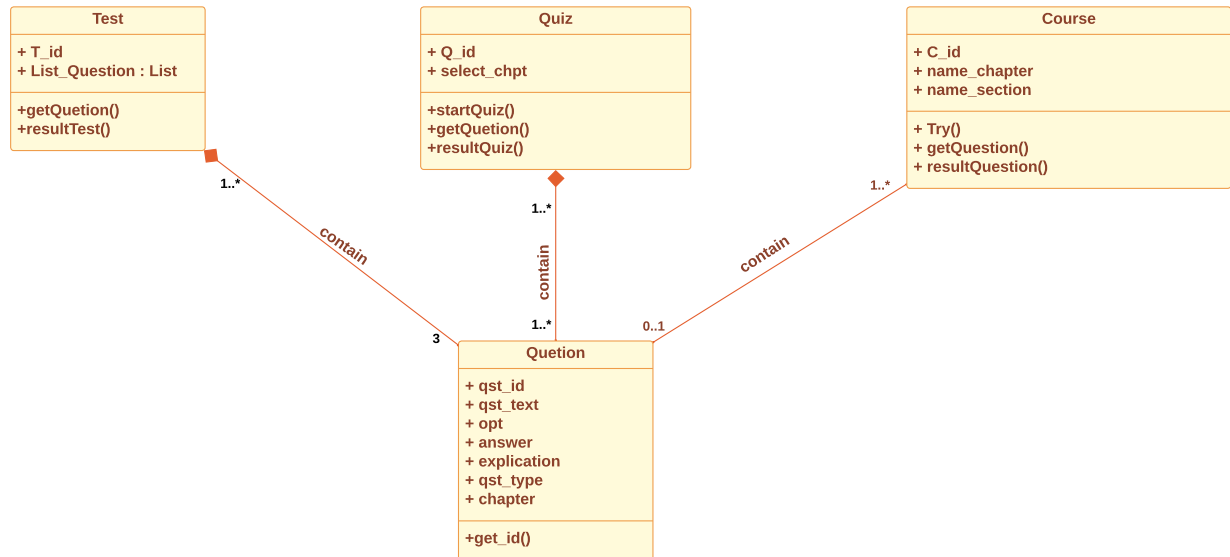

Figure 2.6: Database's Class Diagram.

The table 2.5 represents classes and attributes of database's class diagram as well as their types and description.

Class	attributes	Description	Type
Course	C-id	Course identificator.	Digital
	name-chapter	Chapter's name.	Alphabetic
	name-section	Section's name.	Alphabetic
Quiz	Q-id	Quiz identificator.	Digital
	select-chpt	Choosing chapter.	Digital
Test	T-id	Test identificator.	Digital
	List-Question	List of questions.	Alphabetic
Question	qst-id	Question identificator.	Digital
	qst-text	Questions text.	Alphabetic
	opt	Questions options.	Alphabetic
	answer	Questions answer.	Alphabetic
	explication	Answer explication.	Alphabetic
	qst-type	Questions type.	Alphabetic
	chapter	Chapter's number.	Digital

Table 2.5: Description of Database's Class Diagram.

2.4.7 The relational model and creation of the Database

A relational data model involves the use of data tables that collect groups of elements into relations. These models work based on the idea that each table setup will include a primary key or identifier. Other tables use that identifier to provide "relational" data links and results. Database administrators use something called Structured Query Language (SQL) to retrieve data elements from a relational database.[17]

Course(C-id,#name-chapter).

Quiz(Q-id,#select-chpt).

Test(T-id,List-Question).

Question(qst-id,qst-text,opt,answer,explication,qst-type,chapter).

2.5 Conclusion

This chapter defined the basic steps for developing the system where specified functional and non-functional requirements using the concepts of Unified Modeling Language (Use Case diagram, Sequence diagrams, and Class diagram), and clarified the goal of the analysis and design. Next step is realizing the system by introducing the programming languages, tools, and development environment used on implementation.

Chapter 3

Implementation and hosting

3.1 Introduction

After completing the application design arrange, in this chapter we'll begin the implementation and assessment arrange by displaying the work environments and innovation utilized in creating the application, which made it conceivable to reach the ultimate result, and we'll also display the interfacing whereas actualizing the application capacities, and at the conclusion we provide an clarification of the foremost critical highlights of the application.

3.2 Work environement

This project was built up on distinctive work environement, agreeing to the available capabilities in arrange to reach the most excellent conceivable result. These environments are:

3.2.1 Hardware

For programming we used a laptop, as for testing we used mobile phones, laptops, tabeltes and even a smart tv to monitor the performance of the website on them. The characteristics of these devices are:

- LENOVO laptop(for programming):

– Processor : Intel (R) Core (TM) i7-7600U CPU @ 2.80 GHz(4 CPUs), 2.90 GHz.

– RAM : 16 GB.

– System : Windows 10 Pro - 64 Bit.

3.2.2   Software

Visual Studio Code:

Visual Studio Code is not just another evolved Notepad with syntax colorization and automatic indentation. Instead, it is a very powerful code-focused development environment expressly designed to make it easier to write web, mobile, and cloud applications using languages that are available to different development platforms and to support the application development life cycle with a built-in debugger and integrated support for the popular Git version control engine.[18]

Sublime Text:

Sublime Text is a proprietary, cross-platform text editor designed for people who spend huge amounts of time shuffling code around. A programmer's editor, Sublime Text is a third option to the long-standing "Vi or Emacs" conundrum. Going beyond the basics of syntax highlighting and code folding, Sublime offers a litany of innovative and unique features. With version 3.0 just around the corner, I'm taking you on a tour of Sublime's most compelling features and add-on packages.[19]

XAMPP:

XAMPP is a small and light Apache distribution containing the most common web development technologies in a single package. Its contents, small size, and portability make it the ideal tool for students developing and testing applications in PHP and MySQL. XAMPP is available as a free download in two specific packages: full and lite. While the full package download provides a wide array of development tools, this article will focus on using XAMPP Lite which contains the necessary technologies that meet the Ontario Skills Competition standards. As the name implies, the light version is a small package containing Apache HTTP Server, PHP, MySQL, phpMyAdmin, Openssl, and SQLite.[20]

3.3   Used programming languages

3.3.1   HTML: HyperText Markup Language

HTML (HyperText Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content. Other technologies besides HTML are generally used to describe a web page's appearance/presentation (CSS) or functionality/behavior (JavaScript).[21]

3.3.2   CSS: Cascading Style Sheets

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media.[22]

3.3.3   JavaScript — Dynamic client-side scripting

JavaScript is a programming language that allows you to implement complex things on web pages. Every time a web page does more than just sit there and display static information for you to look at—displaying timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes, or more—you can bet that JavaScript is probably involved.[23]

3.3.4   MySQL — Dynamic client-side scripting

JavaScript is a programming language that allows you to implement complex things on web pages. Every time a web page does more than just sit there and display static information for you to look at—displaying timely content updates, interactive maps, animated 2D/3D graphics, scrolling video jukeboxes, or more—you can bet that JavaScript is probably involved.[23]

3.4   Presentation of graphical interfaces

3.4.1   Home page interface

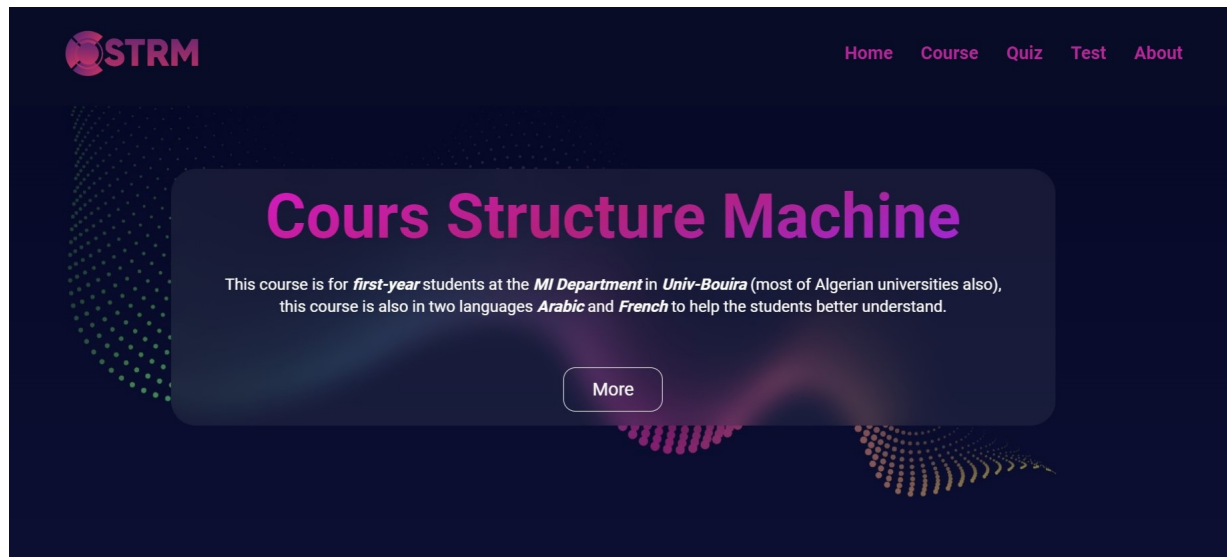When the client visit the website, the first thing he sees is the home page.
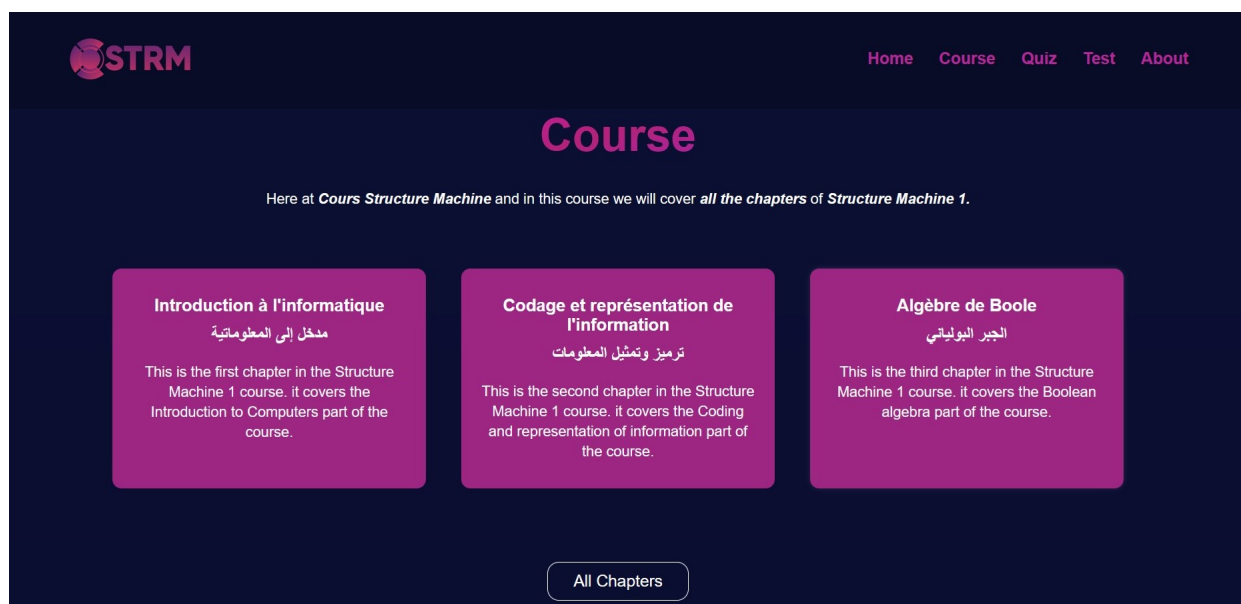
On Desktop:

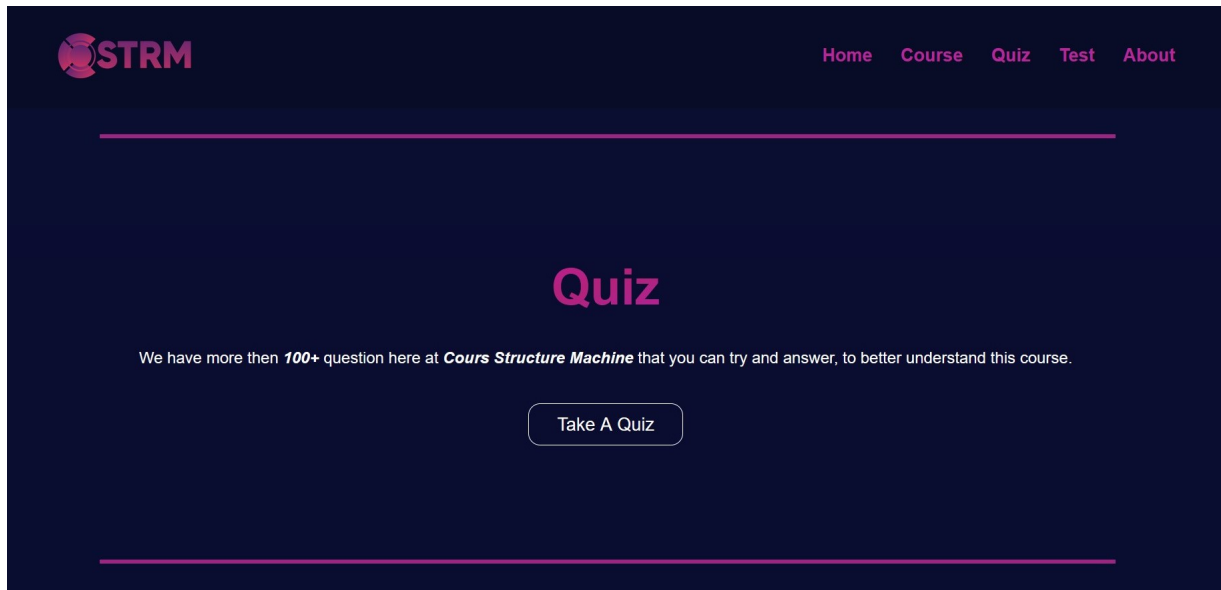Figure 3.1: Use Case diagram.

Figure 3.2: Use Case diagram.

Figure 3.3: Home page

On Mobile:

(a) user$_3$

Figure 3.4: Precision vs α

3.4.2   Course page interface

Figure 3.5: Use Case diagram.

3.4.3 Try interface

Figure 3.6: Use Case diagram.

3.4.4   Quiz interface

3.4.5   Test interface

3.5   Hosting

3.6   Conclusion

In this chapter, we have given a brief and clear clarification of the programming dialects utilized in creating of the application and the programs that were utilized without overlooking the devices utilized, and we too touched and showed the different application interfaces,functions and given a clear clarification of the foremost imperative highlights of the application.

Figure 3.7: Use Case diagram.
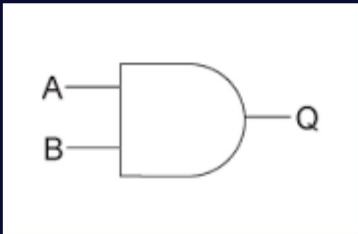
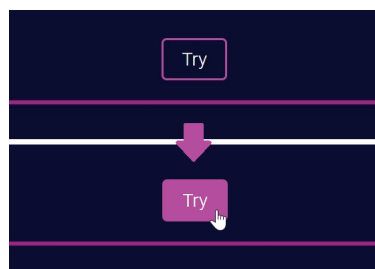Figure 3.8: Use Case diagram.

Figure 3.9: Use Case diagram.
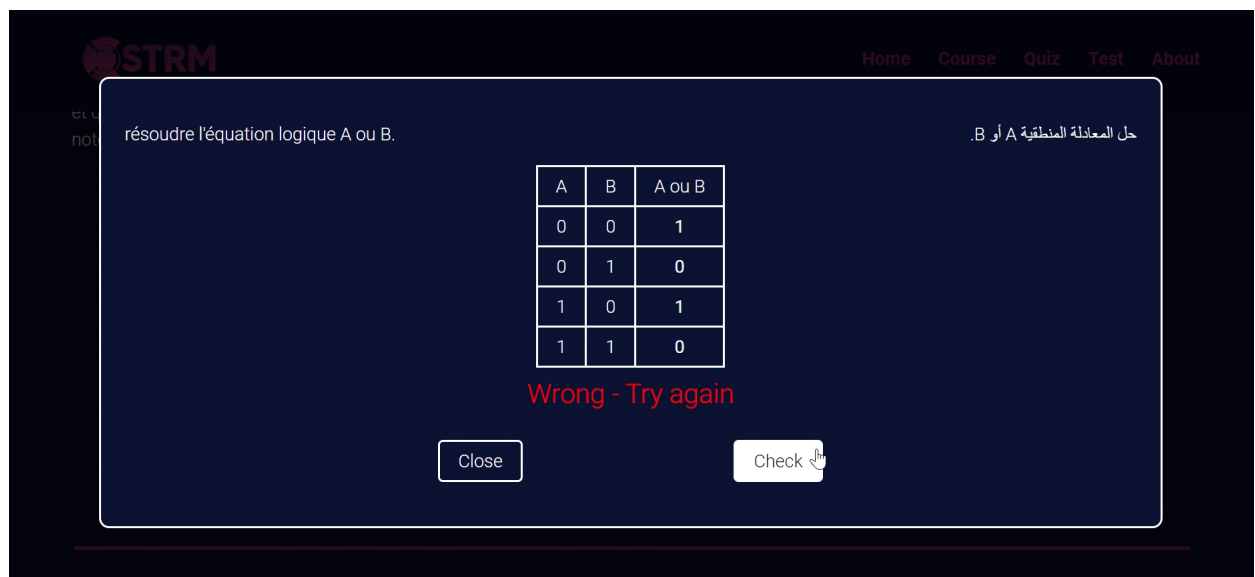
Figure 3.10: Use Case diagram.
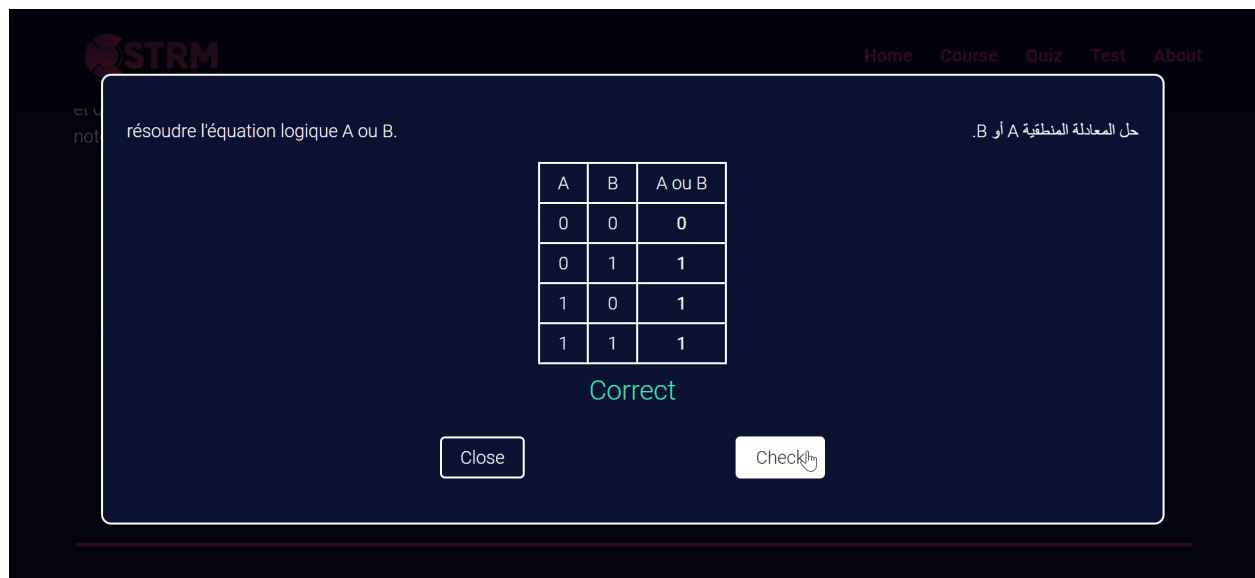

Figure 3.11: Use Case diagram.

Figure 3.12: Use Case diagram.

Conclusion générale et perspectives

Vous allez mettre ici votre **Conclusion génrale**.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Lorem ipsum dolor sit amet, consectetur adipisicing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.

Bibliography

[1] Pam. What is computer architecture? https://www.computersciencedegreehub.com/faq/what-is-computer-architecture/., October 2018. Accessed: 2022-3-6.

[2] Ministry of Higher Education and Scientific Research. *officiel program - Maths and Informatiques*. Ministry of Higher Education and Scientific Research. Accessed: 2022-6-14.

[3] Interactive courses. https://en-academic.com/dic.nsf/enwiki/10720611. Accessed: 2022-3-6.

[4] Responsive web design (RWD) and user experience. https://www.nngroup.com/articles/responsive-web-design-definition/. Accessed: 2022-3-6.

[5] Techopedia. Website. https://www.techopedia.com/definition/5411/website., November 2011. Accessed: 2022-3-6.

[6] Dr.Taha Zerrouki. Strm 1 book. https://archive.org/details/strm-1-book-taha-zerrouki-09-10-2021/STRM-1-Book-Taha-Zerrouki-25-12-2021/, October 2021. Accessed: 2022-3-7.

[7] David Harris and Sarah L Harris. *Digital design and computer architecture*. Morgan Kaufmann, 2010. Accessed: 2022-3-8.

[8] Dr.Taha Zerrouki. Strm tests. https://github.com/linuxscout/strm-tests/. Accessed: 2022-3-7.

[9] saylor academy. Computer architecture. https://learn.saylor.org/course/CS301. Accessed: 2022-3-7.

[10] Hashan Chamara Rajapaksa. Booleantt. https://play.google.com/store/apps/details?id=hashan.haze.booleantt&hl=en&gl=US, February 2022. Accessed: 2022-3-8.

[11] Kyssnar. Dectobin. https://play.google.com/store/apps/details?id=apps.kyssnar.android.dectobin&hl=en&gl=US, September 2018. Accessed: 2022-3-8.

[12] Techopedia. Uml. https://www.techopedia.com/definition/3243/unified-modeling-language-uml#what-does-unified-modeling-language-uml-mean, November 2012. Accessed: 2022-4-30.

[13] YThi. Uml definition. https://ythi.net/abbreviations/english/what-does-uml-mean-what-is-the-full-form-of-uml/. Accessed: 2022-4-30.

[14] Lyes Grine. strm website. https://lyes07.github.io/strm-website/index.html. Accessed: 2022-5-7.

[15] Techopedia. Sequence diagram. https://www.techopedia.com/definition/27490/sequence-diagram-uml. Accessed: 2022-5-3.

[16] Techopedia. Class diagram. https://www.techopedia.com/definition/16466/class-diagram. Accessed: 2022-5-6.

[17] Techopedia. Relational data model. https://www.techopedia.com/definition/21680/relational-data-model. Accessed: 2022-5-7.

[18] Alessandro Del Sole. Introducing visual studio code. In *Visual Studio Code Distilled*, pages 1–15. Apress, Berkeley, CA, 2021. Accessed: 2022-6-11.

[19] Ken Kinder. Sublime text: one editor to rule them all? *Linux Journal*, 2013(232):2, 2013. Accessed: 2022-6-11.

[20] Dalibor D Dvorski. Installing, configuring, and developing with xampp. *Skills Canada*, 2007. Accessed: 2022-6-11.

[21] MDN Web Docs. Html: Hypertext markup language. *Mozilla Developers Network*, 2022-05-02. Accessed: 2022-6-11.

[22] MDN Web Docs. Css: Cascading style sheets. *Mozilla Developers Network*, 2022-05-02. Accessed: 2022-6-11.

[23] MDN Web Docs. Javascript — dynamic client-side scripting. *Mozilla Developers Network*, 2022-03-07. Accessed: 2022-6-11.