



**Princess Sumaya University for Technology  
King Hussein School for Computing Sciences**

**Project Title: Class Cloud**

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# Acknowledgment

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Ameer Jamal and Ahmad Dalala

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# Chapter 1 Introduction

## 1.1 Problem statement

Let's take an example, imagine you are a 4th-grade student trying to learn the multiplication table online, you would have to go to a website like YouTube, find the material than when you finally understand the topic, it would be difficult for you to test yourself on that specific topic, you would have to ask your parents to test you, or ask a teacher later on, and as we know which takes a lot of time and a lot of effort that can lead to demotivation or the simple task of studying something to become an overwhelming and tedious.

How about when it comes to parents being able to monitor their children's progress they can find it very difficult as schools can only meet with parents occasionally and provide a limited amount of information per student, and if their child is on the laptop all the time then how would they know how much material they have crossed, or if they are ready for tomorrow's test or if they got distracted and haven't been studying much at all.

Upon research, it has been found that there are many eLearning websites out there, and applications that cover various areas of educational topics, math, physics, computer programming; however, they are usually very specific to that topic, or for higher levels of education (university/high school) and most importantly missing structure that we think could and will be very beneficial especially when it comes to the younger demographic.

There aren't websites that can cover video lectures for young Jordanian students that test their abilities on certain topics. Everything tends to be generalized to whoever wants to learn and it's the student's job to structure themselves.

The idea is why not simplify and innovate, why not just make a platform that includes video explanations divided by material, topic, and subtopic specialized for the young Jordanian demographic.

## 1.2 Problem Motivation

We are passionate about this cause since a lot of people such as our parent's younger siblings and extended family are facing struggles.

Parents struggle to understand their children's weak points, and where their children are academically, especially after the covid pandemic causing the entire education system to shift online, the parents have no clue on what the academic needs of their children are and the

young students don't know how to structure themselves, how to test themselves, and how to progress in their studies.

Since covid, it's become hard to enquire information from teachers the students are lost.

Lots of parents work most of the day, they relied on the school to structure their child's education.

Not all parents and children are tech-savvy and can understand the complexities of ELearning websites and applications.

Providing the best convenient education solution for our Jordanian youth in the simplest most structured way while also providing informative yet intuitive ways of monitoring for parents is our fuel for this project.

We want education to be a

### **1.3 Solution and what this could lead to**

Our solutions are a website and an android companion app.

What we are building can help solve that problem and help children learn how to self-study in a structured way that can nail results. This can ease stress loads off both children and parents trying to figure out where their struggles are quick.

Imagine a child not having to constantly have to search for the information he needs to study or having to constantly ask for help in each little topic, or having to figure out how to structure themselves by themselves and instead have it all in a step-by-step single-page website.

Moreover, imagine a working parent being able to easily monitor, track and understand their child's weak points and strengths by not having to waste time going to their child's school going from teacher to teacher to try and understand (that's of course if the teacher even specifically remembers their child as they teach hundreds of students a day and couldn't possibly understand each one's strengths and weaknesses)

## 1.4 Stakeholder Analysis

Stakeholder	Interest/stake
Students	They are the main people who will be using this website
Parents	They are who will mainly be using the app and trying to monitor their child's progress
Jordan ministry of education	They set and standardize the school curriculum that the app will follow
Teachers	Can check a student's progress and help them revise questions
Admin	They view and modify the database
Content Creators	Provide videos that will go into the website

## 1.5 objectives

The overall objective of this project is to ease online education and assessment for young Jordanian students by giving them a simple, intuitive yet customized way of learning catered for their needs.

Another objective is to be able to help parents monitor their child's progress and spot weak points/deficiencies quickly and efficiently.

The project also aims to help customize the educational experience and allow Jordanian students to expand their knowledge horizon, giving them opportunities to explore and understand different topics

## **Chapter 2: Literature Review**

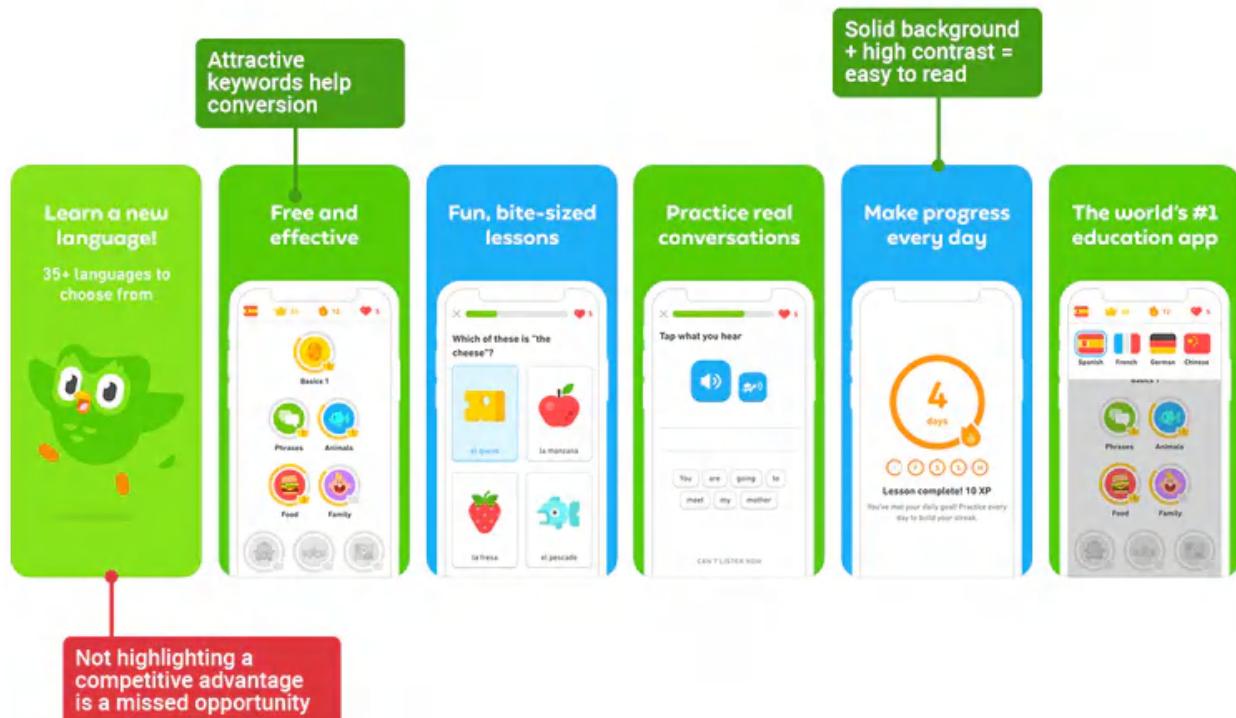
The goal of this literature review is to compare similar websites and apps to the idea we have in mind.

We were inspired by other eLearning and educational websites and surprisingly fitness apps, a lot of fitness apps include intuitive ways to learn workouts track and make progress, there are videos and guides, and places to document the progress you are making leading to all in one place to go to that can show you proper and safe techniques for basic and advanced movements, and a way to easily and structurally track progress, how it works is the app would ask you for your personal information (weight, height, age...etc.) and your level of experience in the gym.

It then customizes your experience.

This can be implemented in a different way for the educational idea we have in mind, which is asking the student which subjects they want to track, what grade they are in, and what level they are at in those subjects and then giving them videos explaining each topic

## 2.1 Related work



Duolingo is a great example of a straightforward language app. It's simple to use.

You set up a profile, choose your target language, set your weekly goals, and off you go!

The problem is though, it is specifically for languages and doesn't adhere to standards required in school, so let's say a student wants to use Duolingo to improve their English

They can do that but it won't help them pass a test with certain criteria

More problems include but are not limited to

- No control over the vocabulary topics, the order they are in so you can't jump to the topic you need
- A lot of ads on the free version of the app  
Not specified towards students.
- Uses their own criteria instead of academic criteria that can help you improve in school
- Uses their own criteria instead of academic criteria that can help you improve in school
- Not specialized for Jordanian students
- No monitoring feature for parents or yourself
- Only for languages and not multiple subjects

The screenshot shows the Khan Academy user interface. At the top, there is a navigation bar with 'Courses ▾', 'Search', and a magnifying glass icon. The 'Khan Academy' logo is in the center, followed by 'Donate' and 'Ameer Jamal'. Below the navigation is a user profile card for 'Ameer Jamal' (@ameer101). The profile includes a profile picture, a bio (@ameer101 - I'm here in the purpose of trying not to fail.), an 'Edit Profile' button, and a progress bar showing 33,865 points and 17 achievements.

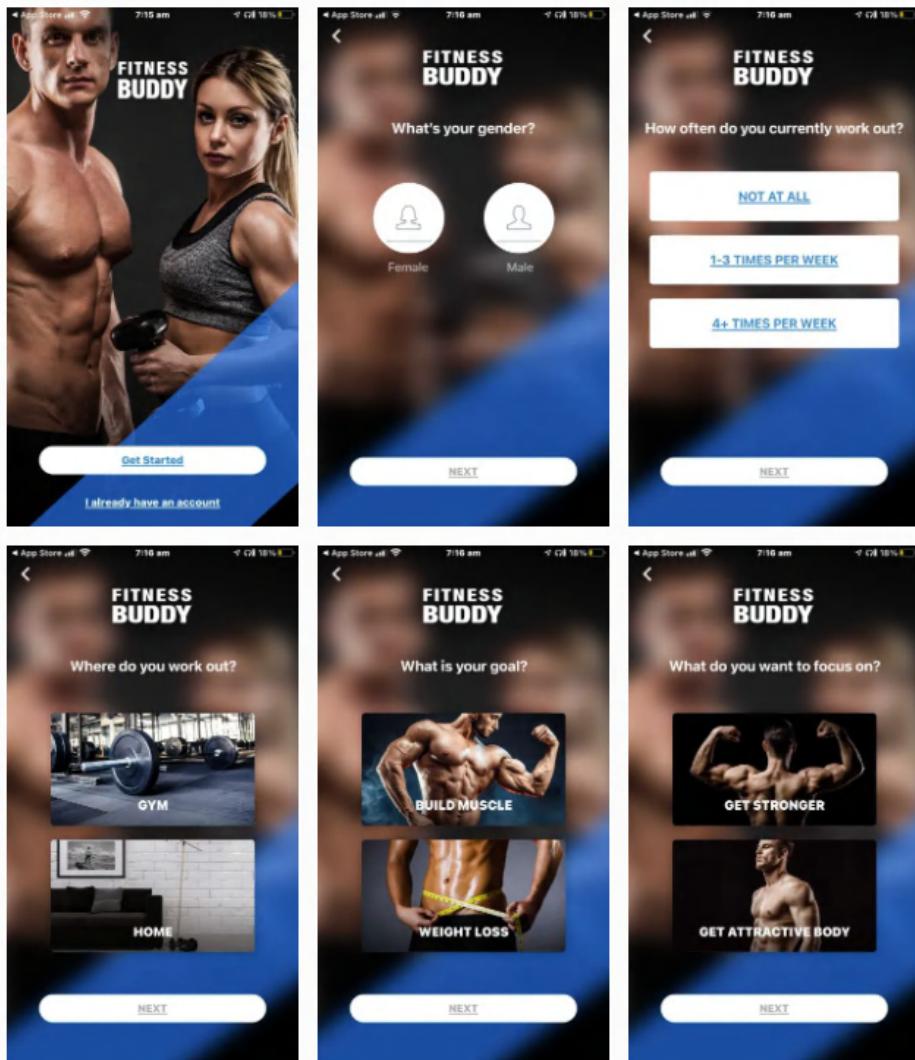
The main content area is titled 'My courses'. It is organized into several sections:

- MY STUFF** (dropdown menu): Courses, SAT.
- MY ACCOUNT**: Progress, Profile, Teachers.
- My courses**:
  - College admissions** (7 items): Life after college, Exploring college options, Paying for college, Getting started, Wrapping up. A 'Resume' button is located here.
  - Computer programming** (8 items): Intro to SQL: Querying and managing data, Advanced JS: Games & Visualizations, HTML/JS: Making webpages interactive with jQuery, Intro to JS: Drawing & Animation, Intro to HTML/CSS: Making webpages. A 'Start' button is located here.
  - Computer science** (3 items): Information theory, Cryptography, Algorithms. A 'Start' button is located here.
  - Differential Calculus** (6 items): Parametric equations, polar coordinates, and vector-valued..., Applications of derivatives, Analyzing functions, Derivatives: chain rule and other advanced topics. A 'Start' button is located here.

Khan academy is a great example of how eLearning websites should be. It provides a lot of structure and a variety of topics, we look up to khan academy as inspiration for what we would like to build.

Khan Academy's issues are the fact that it is universal and not specialized towards catering for the Jordanian youth. Another problem of khan academy is the level of education is higher and aimed towards high school/university-level students.

What we can do is build upon this website and make it suitable and aimed towards the Jordanian learning criteria. And make it more intuitive for the younger students

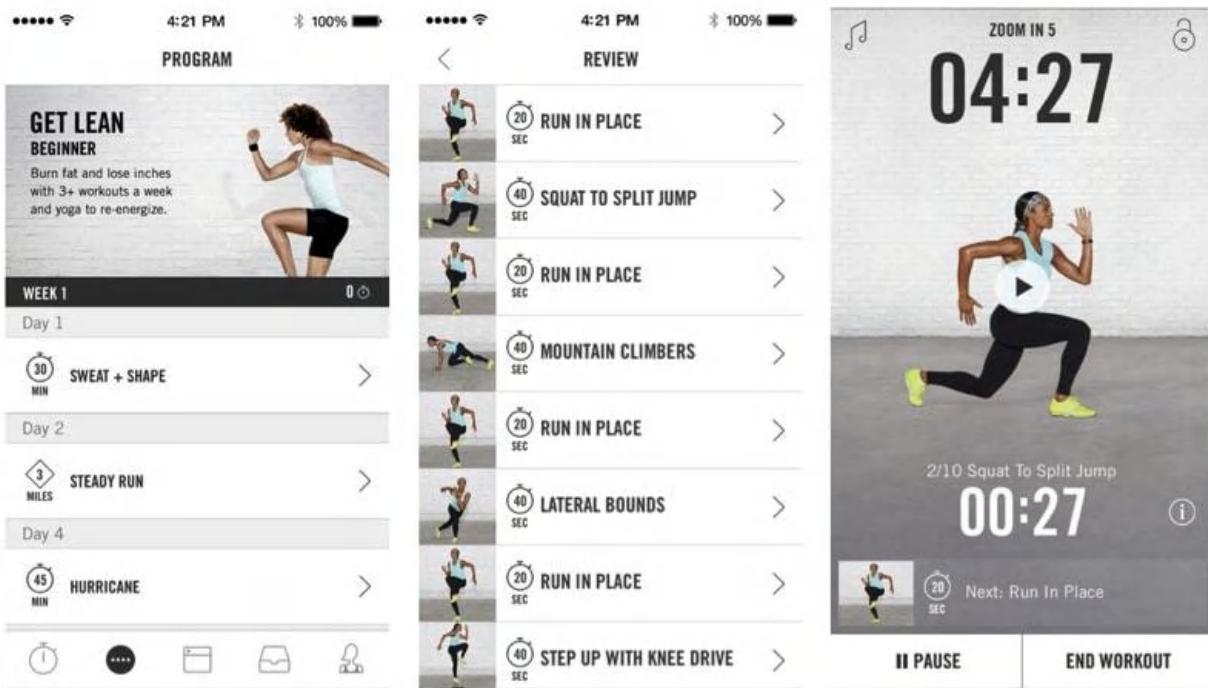


Fitness Buddy is one of the apps that inspired the idea of an eLearning website that benefits from the idea of what fitness apps are trying to do.

Fitness buddy gives a user a customized experience depending on who they are by asking questions about the user, and their goals

The image displays three screenshots of a mobile fitness application interface. The first screenshot shows a 'Discover' section with a 'WORKOUT OF THE WEEK' banner featuring a man performing a pull-up on rings, with the text 'TOTAL BODY FITNESS'. The second screenshot shows a 'Saved Workouts' section with three categories: 'Saved Workouts', 'Custom Workouts', and 'Workout History'. The third screenshot shows a 'All Activities' section for July 2021, displaying a calendar and a list of four activities on Jul 21, 2021, including 'Workout (Jul 21, 2021)', '94 Cal', 'Workout (Jul 21, 2021)', and 'Workout (Jul 21, 2021)'.

As we can see it then gives them exercise and a calendar to help track progress and know exactly what they did and see how much they've improved over a certain amount of time, the way we would apply this ideology is by giving students statistics and charts to help show them what they've done throughout the week, month, etc. and also use that information to pull app charts for the student and parents, it could help highlight what tests they haven't been succeeding, how long have they been studying on average, and where they are excelling



The Nike Training Club (NTC) is another inspiration for the concept we are building, its main feature is the world-class trainers that show how to do each and every movement safely and effectively so you can follow along and be able to get a step by step guide, the way we would apply this is by having the same concept but for learning, as in short to the point videos helping the student understand a topic step by step, with mini-tests after each topic or subtopic

## 2.2 Why we are thinking of making an educational website, and not an educational game?

It has been suggested to make an educational game instead of an eLearning platform, To answer this question we first need to understand what's The Definition Of The Flipped Classroom?

A flipped classroom is a type of blended learning where students are introduced to content at home and practice working through it at school. This is the reverse of the more common practice of introducing new content at school, then assigning homework and projects to be completed by the students independently at home.

And as studies have shown flipped classrooms can be very beneficial when it comes to learning, our idea is basically that, introducing the school curriculum for Jordanian youth via online short video and testing them all in one, with the added benefit of monitoring

As quoted by Nicole Jackson at the California State University, in Monterey Bay in the study “Beneficial or Not: Flipped Learning in an Elementary Mathematics Classroom”

“Flipped classrooms are the opposite of the traditional instructional approaches to classroom instruction. In traditional classrooms, often the teacher is the main focus, and students usually memorize and repeat information.”

Showing that the classical learning system is flawed and can be improved upon

Nicole Jackson also stated that (the student) “may use tools or practice a program with little stimulating engagement.”

As the website we are proposing is to do, furthermore, Nicole Jackson’s study states that:

“This creates students that display a lack of drive for development of motivation and self-regulated learning (Lai & Hwang, 2016). This type of instructional approach may not identify students who continue to struggle with acquiring content knowledge (Freeman, 2012). Furthermore, when the single modality presentation style is used, it only allows students to use one cognitive channel: visual or audio/ listening or reading. Solely relying on one modality can be cognitively demanding for students and can cause cognitive overload, a situation in which information is not stored correctly or at all because of exceeded mental limits in information processing (Mattis, 2015). However, the flipped classroom allows students to take charge of their education and to acquire self-regulation skills to monitor their learning and needs with assistance from the teacher (Lai & Hwang, 2016). their own learning. This is important because students can go deeper and comprehend more complex ideas (Lai & Hwang, 2016). In addition, there is an increase in engagement as students enjoy the learning process more when given the opportunity to self-regulate their learning.”

From this study, we can determine that an eLearning platform that meets the necessary requirements can fulfill a student’s curiosity and push them into learning how self-regulate their progress which can lead to them feeling empowered.

As for games, when we think of a game we think of levels and a certain topic and a fun and interesting way of progressing in the game.

This idea can be fun and drive the student to play, but comes with some drawbacks including but not limited to:

- Games will be working harder on testing students to get past a level and not on deeply educating them on the topic. Leaving them stuck at some part
- It is difficult within the time scope to build a game that covers multiple topics, making a game would mean compromising on the amount of education a student receives
- Games can have animations that can help a student stay engaged but also do not do a full job of explaining a topic and teaching them how to solve problems
- Game development requires deep knowledge in how to use game engines and animation software, which as a software engineering team is not within our technical capabilities
- Games can make children distracted and cause mental fatigue when stayed on too long whereas what we are building will cut up the learning into bite-sized chunks that can give students faster results and an immediate sense of accomplishment

Furthermore, A comprehensive study from the Journal of Health Psychology by

Niko Männikkö, Heidi Ruotsalainen, (2017) Problematic gaming behavior and health-related outcomes: A systematic review and meta-analysis show that gaming disorders are linked to greater levels of loneliness, anxiety, depression, sleeping problems, social problems, and many other psychological-social problems. Which can cause further complications for young students trying to learn.

# **Chapter 3: Software Project Management Plan**

# 3.1 Project Overview

## 3.1.1 Project Purpose and Objectives

The main purpose behind Cloud Class is to provide a free and personalized nationwide education for Jordanian students of all ages. Class Cloud offers, instructional and demonstrational videos, and practice exercises with quizzes, all aimed to encourage and motivate students through a personalized learning dashboard, that shows their progress, their weaknesses and strengths, and their rank amongst other enrolled classmates! We are working hard to ensure that Cloud Class empowers everyone related to academia, such as students, teachers, and concerned guardians, who are understanding what their children or students are up to, and how to help them.

We intend to deliver a website with a complimentary/ companion application that considers our mission and a phrase we live by; “work smarter, not harder”, wherein this case, the student could only focus on strengthening their weak point by taking quizzes that will direct them to another video or source to ease the studying process for them and help them. The student or the parent could see at a glance whether they are struggling in a certain subject or if they hit a streak. The teacher also can view the performance of each student in detail and the class as a whole.

As we thrive for uniqueness and originality, it is of the utmost importance to consider that Class Cloud is not like any other learning platform, as it distinguishes itself by bridging the gap between students and their demotivation to learning. It's not a seasonal system, where it is only used during the school year! Instead, it's students' daily brute-force for motivation.

The completion of Class Cloud is in the month of June, the year 2022. Costs of creating Class Cloud, must not exceed the assigned limit. Moreover, all team members shall not only adhere to providing the best quality standards they can but also work their best to give stakeholders the satisfaction they expect!

## 3.1.2 Project Selection

### 3.1.2.1 Methods for Selecting the Project (Class Cloud)

How was Class Cloud selected?

Class Cloud was picked after asking several people about what they feel is missing post-COVID. Most of the people around us mentioned how a lot of them, and their relatives faced major learning losses due to school closures during the COVID lockdown. This heavily impacted them negatively, which made us consider the importance of redefining online learning and bridging the gap between students and online learning.

Our focus on broad organizational needs was divided as follows:

- Need for Class Cloud:
  - We struggled to find an online educational platform that covers all Jordanian students' needs (structures, has test exams, extra materials, able to predict marks, and tracks average)
  - We also didn't find any local educational platforms other than "Darsak", which was released late for students, and had many complains from all involved parties (students, parent, and teachers), the system wasn't as structured and not as reliable nor available.
- Available funds: Currently, Princess Sumaya University of Technology is responsible for most of the funds.
- Willingness to succeed: We are truly eager to make this project succeed and we actually can't wait for people to try it. We will use this project as an enrollment key in Crown Prince Award, as we are extremely enthusiastic for it to be in the hands of the public. Our time investment in studying and prioritizing this project genuinely made us realize that our aim is to make all stakeholders beyond satisfied and thrilled to continue using our platform.

Categorizing Class Cloud:

Class Cloud addresses the following:

- Problem: The main problem Class Cloud addresses is that clearly Jordanian students lack motivation and clarity in the scope of learning. Especially after the Coronavirus,

this- all together, got worsened and weakened their logical and intellectual abilities further. So we decided to come up with a practical solution that allows students to catch up with their learning needs and allows parents to monitor and motivate their children more!

- Opportunity: Since Cloud Class is a structured all-in-one learning platform, it will generally improve any educational organization associated with it. For example, if schools used it as their ultimate e-learning platform, it will totally enhance this organization's average results, as it is providing a personalized learning experience, rather than assuming all students are of the same level.
- Directive: Class Cloud, also addresses new and updated requirements for an educational learning platform, which are imposed by students. Class Cloud will take about two semesters to be released and it should be given the most priority, as it tackles major issues regarding online learning, recovers the learning gap COVID caused, and betters students' and parents' well-being is giving them the motivation and hope they need to recover from the negative impacts regarding education and learning this pandemic has caused.



Figure SEQ Figure 1\* ARABIC1: Three Spheres Model of Class Cloud

### 3.1.3 Project Charter

**Project Title:** Class Cloud

**Date of Authorization:** October 15, 2021

**Project Start Date:** October, 15, 2021

**Project Finish Date:** 15, June 2022

#### Key Schedule Milestones:

1. Fully understand similar systems to Class Cloud and know their strengths and weaknesses	November, 01,2021
2. Finish the first version of Software Requirement specification (SRS)	January 07, 2022
3. Build a prototype of the website and application	February 07, 2022
4. Finish a functional version	March 07, 2022
5. Finish quality assurance and testing by	April 07, 2022
6. Finish a production version of the software with documentation	May 15, 2022
7. Test the system	May, 30,2022
8. Check for user acceptance	May, 30,2022
9. Deployment	June, 15,2022

**Budget Information:** The budget allocated for the Class Cloud project is XXX JOD, and no additional funds shall be available. All work on this project will be done by the project team, and tools will be purchased to support the project development.

**Project Objectives:** Class Cloud has been going for 8 months. The target is to complete the first version of the software requirements specification (SRS) in 3 months, a functional version in 7 months, and a complete production version in 1 month.

**Main Project Success Criteria:** The software must meet at least 70% of written specifications (mainly to allow the users to be able to watch videos and take a quiz on that video, and see their rank). This shall be considered a success after thorough testing. The 70% must be completed on time. The supervisor shall formally approve the project all other key stakeholders must be satisfied with the system.

#### Approach:

1. In the first two weeks, we are obliged to understand the pros and the cons of the top online learning platforms, including their strengths and weaknesses, this shall allow us the ability to determine the initial scope of our endeavor.

2. The 4 months from the Class Cloud's initial starting date, we shall create a clear and concise version of the software requirements specifications (SRS). Where we tend to have all details related the work required in hopes of ensuring a clear project scope.
- 3.
4. Within 2 weeks develop a clear work breakdown structure (WBS), scope statement, and Gantt chart to ensure Class Cloud application sequencing instrument.
5. Divide the work between the project team members then evaluate and observe the finished work by each team member.
6. Hold weekly progress review meetings with the project team and the supervisor.
7. Conduct a thorough application functional testing once approval is obtained on
8. The test plan.

Roles and Responsibilities			
Name	Role	Position	Contact info.
Dr. Abdullah AL-Refai	Supervisor	Supervise	
Ameer Jamal	Test Manager, Team Member	Programmer, Document writer	Ame20180@std.psut.edu.jo
Ahmad Dalala	Development Manager, Team Member	Programmer, Document writer, Manager	Ahm20180@std.psut.edu.jo

### 3.1.4 Project Scope Statement

The project scope defines the items that will be delivered throughout the project's lifetime. Delivering full system documentation, handing a production version of the software which includes the main functionalities that are tested, also rolling the production version out to users are part of this project scope. defining the scope of a project is a necessity to ensure adherence to the project needs.

**Project Title:** Class Cloud

**Date:** October 15, 2021,

**Prepared by:** Ameer Jamal

**Email:** Ame20180381@std.psut.edu.jo

**Project Justification:** the lack of good and structured educational platforms and the aim to provide a free and personalized nationwide education for Jordanian students of all ages. with instructional and demonstrational videos, practice exercises with quizzes, along with the ability to see at a glance whether the student is struggling in a certain subject or if they hit a streak.

**Product Characteristics and Requirements:**

- 1- The system shall allow users to register and login to the system
- 2- The system shall be able to allow students to watch lectures and take quizzes
- 3- The system shall direct students to any additional material when the student doesn't answer a question wrong
- 4- The system shall allow parents, students, and admins (teachers) to view the rank of the student
- 5- The system shall allow the admins to add, remove, and modify the material in the system.
- Product requirements are described in detail in the software requirements specification (SRS) chapter in the document.

#### **Summary of Project Deliverables:**

##### Project Management Related Deliverables:

Provide a software project management plan (SPMP) that has a project charter, scope statement, project schedule, budget summary, work breakdown structure (WBS), and project timeline.

##### Product-Related Deliverables:

- 1- Requirements specification (SRS) document: shall contain all the defined user and system requirements, with the elicitation techniques and interdependencies.
- 2- Software Design Document: Shall contain all relevant designs (diagrams) related to the scope of the project in UML, SOLID principles followed, and design patterns to be taken into consideration in the development phase.
- 3- Software Development: The system shall include source code of the main implemented features related to logging in and registering, watching videos, taking quizzes, directory of other additional material, ranking, and allowing the admin to modify the material.
- 4- Testing Document: shall include the delivery of software test document (STD). Which is intended to describe the test plan, approaches taken and considered, who will conduct the testing, and what tests are applied on the software.
- 5- Rollout Document: the software shall be published on the date of xxxxxxxxx . The last phase of the project must include all the updates that shall be available to the user.

**Project Success Criteria:** Our aim is to complete the project within 10 months, without exceeding the defined budget, and to hand all needed deliverables.

### **3.1.5 Assumptions and Constraints**

High level strategic and operational assumptions and constraints are usually identified before the project is initiated and identifying them, will help in determining the boundaries of the project, to give an insight on what is and not achievable. The project manager shall measure the effects of the constraints over the six major key factors of the project. Which are defined as, scope, schedule, cost, quality, risks, and resources.

#### Constraints:

1. Scope: Knowing that we have stakeholders of different age groups, it is safe to consider that one of the constraints regarding our scope is the stakeholders that are invested in our project. For example, we might list a set of deliverables that could-or-might be

created if budget and schedule allows us to, which are the “wish list” that our main stakeholders can choose from if there’s money and time left over after mandatory deliverables are completed.

2. Schedule: As sticking to the project’s assigned deadline plays a vital role in the measurement of the success of the project, we worry that the project manager’s estimate wouldn’t be as reliable, since the project manager will depend on similar past projects of other companies for precedent and use their data to give approximate scheduling for the project. Therefore, the project and the deliverables should be met at the assigned deadline.
3. Cost: the cost of the system is normally dubbed as the project’s budget, as it compromises and contains all the resources needed to complete the project within the assigned deadline, in its predetermined project scope. It is important to not forget that the cost is not just mean money for materials, it also encompasses costs of quality control, vendors, labor, and more. Hence, the cost must not exceed the budget assigned and approved. An additional constraint we might face is that there aren’t as many online platforms that shared their costs, so there is a lack in history regarding cost analysis of projects of similar scope. This issue might cause cost overruns.
4. Quality: If the project scope extends due to any additions to the scope, which we might not have the extra time or resources to deliver the promised quality. If delivery time is cut or rushed, the cost of Class Cloud may rise and quality will very likely decline as we intend to stay around the budget limit. Another thing we fear is any sudden rise in costs in programs we might use.
5. Risks: The inability to foresee future and present failures at every step of the project and the ability to prepare for them accordingly, might be a huge risk by itself. The project manager must be able to prepare solutions for these risks. In addition to the importance of involving a play out what-if scenarios and formulating contingency plans at every step. The project manager must also tell the risk tolerance and its effect on the project. It is significant to also believe that risks may allow unexpected opportunities to arise.
6. Resources: The resources of the project are all the necessary components that make up the project, without them it is impossible to complete the project. These resources could be human, financial, technological, governmental, etc. For the project manager, the management of resources is an essential in the project, because the resources are finite and limited (like the software we used for the design phase). Here, the manager is obliged to make the best use of the resources that are available.

Assumptions are another key part of any project planning, as they portray the different denominators to be the case, without having to prove them. Project assumption is the events or conditions that are most likely to occur when a project life-cycle takes place. It is also deemed as an element in the planning phase of a particular project that is assumed to be considered as true, actual, or certain despite the lack of evidence or proof

Assumptions:

1. The people involved in this project might not be in their best due to unexpected illnesses such as (COVID) which might cause a lack of efficiency while working on the project, this should be taken care of, as it might affect the key constraints.
2. All of the people that are involved at the beginning of the project will remain and stay in the project until the project is submitted and deployed.
3. All tools used are obsolete.
4. The project team has access to the tools they need to execute their tasks on 24/7, which includes xxx software as well as electricity during their working time.
5. All key stakeholders will be interviewed
6. All team members have the required skills to take in this endeavor

### **3.1.6 Tools and Techniques Used**

1- Project Management:

- Zoom: We used Zoom as our online communication tool, we were able to create meetings and show our work through it. We were able to record important meetings, along with sharing each other's screens.
- Google Calender: to be able to schedule meeting times

- GIT/ GITHUB: For being able to perform cloud backups and push requests and code at the same time.
- Mutual Coding: joining up with the partners to code and discuss the implementation in real life
- Gmail: for sending and receiving emails
- whatsup web: for quick back and forth chat
- google docs: for real time documentation editing
- Creatley: Creatley is a diagramming tool designed to help businesses increase team collaboration. This tool works as a visual workspace by allowing teams to brainstorm, plan, and design various projects in real-time from one, single platform.

## 2- Design And Prototyping:

- Creatley: Creatley is a diagramming tool designed to help businesses increase team collaboration. This tool works as a visual workspace by allowing teams to brainstorm, plan, and design various projects in real-time from one, single platform.
- Visual Paradigm: is a software application designed for software development teams to model business information systems and manage development processes. In addition to modeling support, this technology provides report generation and code engineering capabilities including code generation.
- Lucidchart: is a web-based proprietary platform that allows users to collaborate on drawing, revising, and sharing charts and diagrams.
- PlanHammer: helps in prototyping GANNT CHARTS and WBS structures

When don't with a design completely and development add.

### 3.1.7 Schedule and Budget

This part should be written after testing

Also add a variant (calculate how far are we from the budget)

## 3.2 Project Plan

### 3.2.1 Software Development Lifecycle

The project software development life cycle (SDLC) is determined based on searching and comparing different software development life cycles (SDLC). The options of the development methodologies that were taken into consideration were: iterative, incremental, or waterfall approaches.

We have decided to follow the incremental approach as we feel that our requirements are dynamic, they tend to change over time, and they are performed once for a given increment. However, we have different increments. The activities are just performed once per that increment that we're delivering so the delivery is frequent smaller deliveries in other words and the goal of this approach is the speed we're getting something to the market we're getting an increment delivered as soon as possible with incremental life cycles when businesses or initiatives cannot afford to wait for everything to be completed then they can deliver in increments something that is still complete enough to be used but not the whole product necessarily in this situation.

The users are willing to receive a subset of the overall solution delivered in frequent small releases now you could provide a single feature at a time.

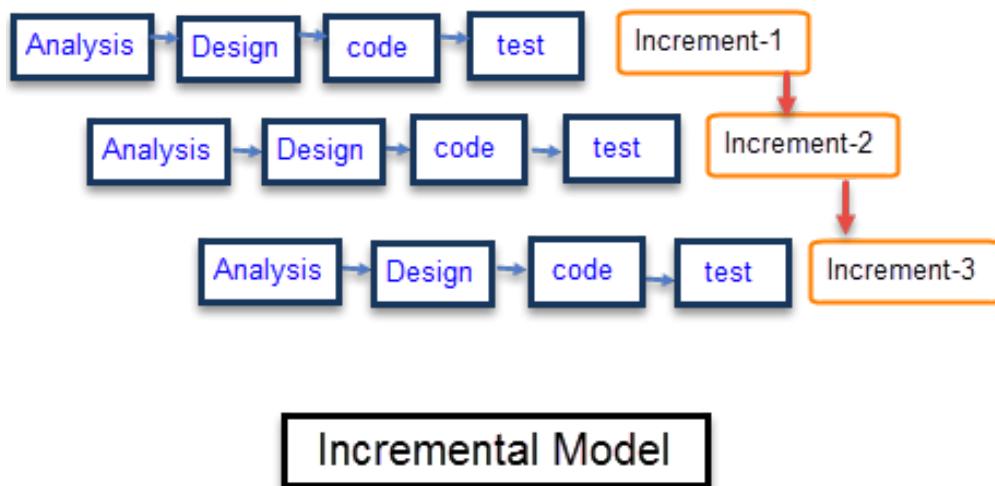


FIGURE SEQ Figure 1\* ARABIC2: Process done to depict Incremental life cycle

### **3.2.2 Work Breakdown Structure (WBS)**

To mitigate the project risk and describe the task units that must be performed by team members, a Work Breakdown Structure (WBS) is provided below:

Initiating

    Select project manager

    Form project team

    Develop project charter

Planning

    Develop scope statement

    Create WBS

    Develop and refine other plans

Executing

    Concept

        Evaluate current systems

        Define requirements

        Define user requirements

        Define system requirements

        Define specific functionality

        Define risks and risk management approach

        Develop project plan

        Brief web development team

        Brief application development team

    Web Site Design

        Registration system

        Login system

View video lectures system

Take quizzes

Directory to additional material

Ranking system

Directory system

Design completed

Web Site Development

Registration system

Login system

View video lectures system

Take quizzes

Directory to additional material

Ranking system

Directory system

Testing

Testing completed

Roll Out

Move site to production server

Determine roll out schedule

Communicate roll out plan to users

Conduct user training

Release internal PR

Support

Determine what support resources are needed

Make appropriate staffing changes

### 3.2.4 Task Allocation

is the process of assigning and scheduling available tasks in the most effective and efficient way possible. This is mainly aimed to determine the roles and responsibilities of each team member in the group, and the degree of involvement in each category.

- Mutual Responsibilities for monitoring, following up, assigning the work progress, and managing all related project management activities. In addition to primarily focusing on the documentation creation, and providing help in the different scenarios in the implementation phase.
- Ameer Jamal: Is responsible for the testing phase, and writing documentation. In addition to developing parts of the user interface and testing the user experience, also responsible for ensuring the integrity of functional and non-functional requirements/ on the development side his major responsibility is class association from our design specification document to development and bug/error handling for unit and black-box testing.
- Ahmad Dalala: Responsible for writing parts of the documentation specified in the requirement specification and design specification, as for his development responsibilities throughout the entire project, he is responsible for managing the development of the application and relating/tracing the requirements into functional code, he is also responsible for database integration and ensuring that the database integrity remains consistent under many transactions.

# 3.3 Risk Management

## 3.3.1 Risk Source

This is the fundamental driver that causes risks in a project. There could be more than one source of risk. Class Cloud's sources of risk were gathered from brainstorming sessions, stakeholder analysis, and the study of the application domain. Risk sources are both internal and external to the projector system. As the project progresses in the future, sources of risk might be identified and shall be discovered. Therefore, establishing the right categorization for risks shed light on the most to least urgent risks, and allows the team to focus on finding the solution to risks that can have serious consequences on meeting project objectives.

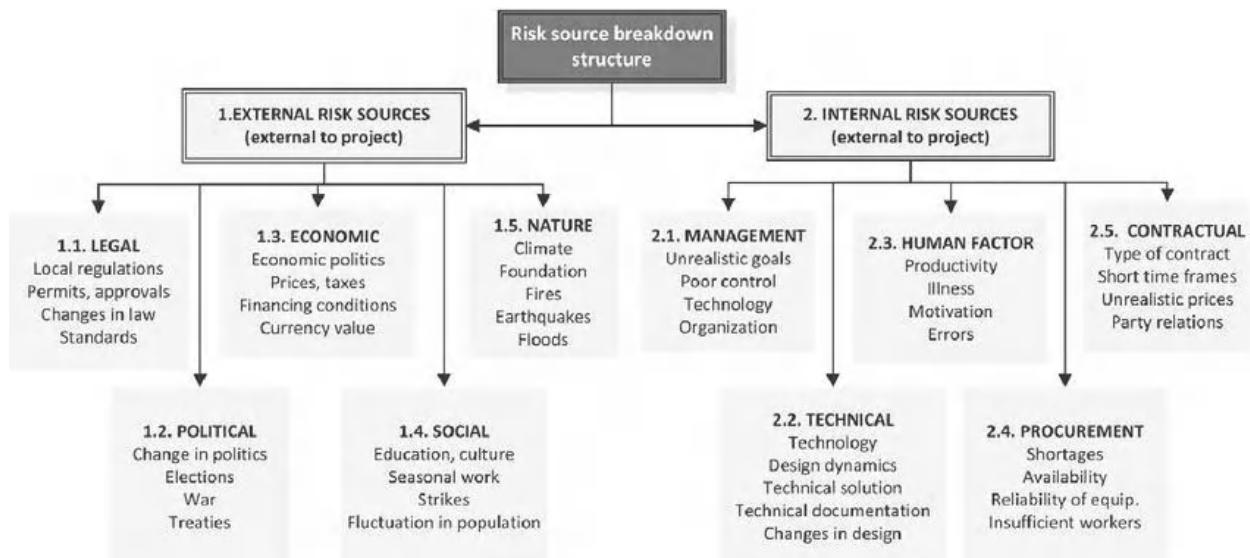


FIGURE SEQ Figure 1\* ARABIC3: Risk Source Breakdown

### 3.3.2 Risk Identification

This refers to being the first step in risk analysis, and it is considered a crucial part of the risk management process. these risks could potentially prevent the system from achieving its scope objectives.



FIGURE SEQ Figure 1\* ARABIC4 Steps for Risk Management

**Table: risk identification**

R1	Deadline of the project is not met	Project	Organizational
R2	The needed skills in the programming language identified is not among all team members	Project	Organizational
R3	Backend developer doesn't have/ doesn't meet the required skills	Project	Organizational
R4	Retrofit poor documentation	Project	Technical
R5	the programming language identified doesn't have tools that support it	Project	Business
R6	Inability to validate updated/ new requirements	Project	Organizational
R7	Customer satisfaction is not achieved	Project	Organizational
R8	Maintainability issues or poor system maintenance	Project	Organizational
R9	Inexperience of team members regards using the proper documentation tools	Project	Organizational
R10	Lack of plugins for the identified programming language	Project	Technical
R11	Lack of familiarity with testing tools	Project	Organizational
R12	Poor skills in writing a proper and up to the level test plan	Project	Organizational
R13	Underestimation of the project's cost	Project	Organizational
R14	Lack of security and security testing in the application	Project	Organizational

### 3.3.3 Risk Analysis

Priority	Probability	Impact
High	High chance of occurring and happening and might affect the whole system	Cannot proceed with the project activity if not solved immediately.
Medium	50% probability of occurrence	May not proceed in project activity if its not solved
Low	Low occurrence rate	Can be resolved in a later stage or could consider taking another alternative for the risk.

**Table: Risk Analysis**

Risk ID	Probability	Impact	Priority
R1	High	High	High
R2	High	Medium	High
R3	High	Medium	High
R4	High	Medium	High
R5	Medium	Medium	Medium
R6	Medium	Medium	Medium
R7	Medium	High	High
R8	Low	High	Medium
R9	High	Medium	High
R10	High	High	High
R11	High	Medium	High
R12	Medium	High	High
R13	Medium	High	High
R14	High	High	High

### 3.3.4 Risk Matrix

**Table: Risk impact/probability**

Impact/Probability	Low	Medium	High
Low			
Medium		R5 R6	R2 R3 R4 R9 R11
High	R8	R7 R12 R13	R1 R10 R14

Relevant IEEE standards: IEEE-830[5]:

The SRS is a specification of the requirements for the software “product” that shall be delivered. The basic issues to be addressed are

- a) Functionality. What is the software supposed to do?
- b) External interfaces. How should the software interact with people, the operating system, hardware, networks, and other software?
- c) Performance. What are the requirements for speed, availability, response time, the recovery time of various software functions, etc.?
- d) Quality Attributes. What are the requirements for portability, correctness, maintainability, security, etc?
- e) Design constraints imposed on an implementation. Is there a requirement for a particular programming language? Are there resource limits (such as disk or memory size)? Must it run on a particular operating system? Must it inter-operate with particular web browsers? etc.

The SRS contains **requirements** and not the **design solutions**; it is the “what” and not the “how” of the project. The information is collected from the project client. In a good SRS, the requirements should be: Correct, Unambiguous, Complete, Consistent, and Ranked for importance, Verifiable, and Traceable.

A requirement is **verifiable** if there exists a way to check that the software meets the requirement. Non-verifiable requirements include statements such as “works well”, and “good human interface”. If a method cannot be devised to determine whether the software meets a particular requirement, then that requirement should be removed or revised.

Requirements must be traceable through design, implementation, and system test –that is, it must be possible to trace each requirement to the parts of the design that support it, to the code that supports it, and to make sure it has been tested in the final software.

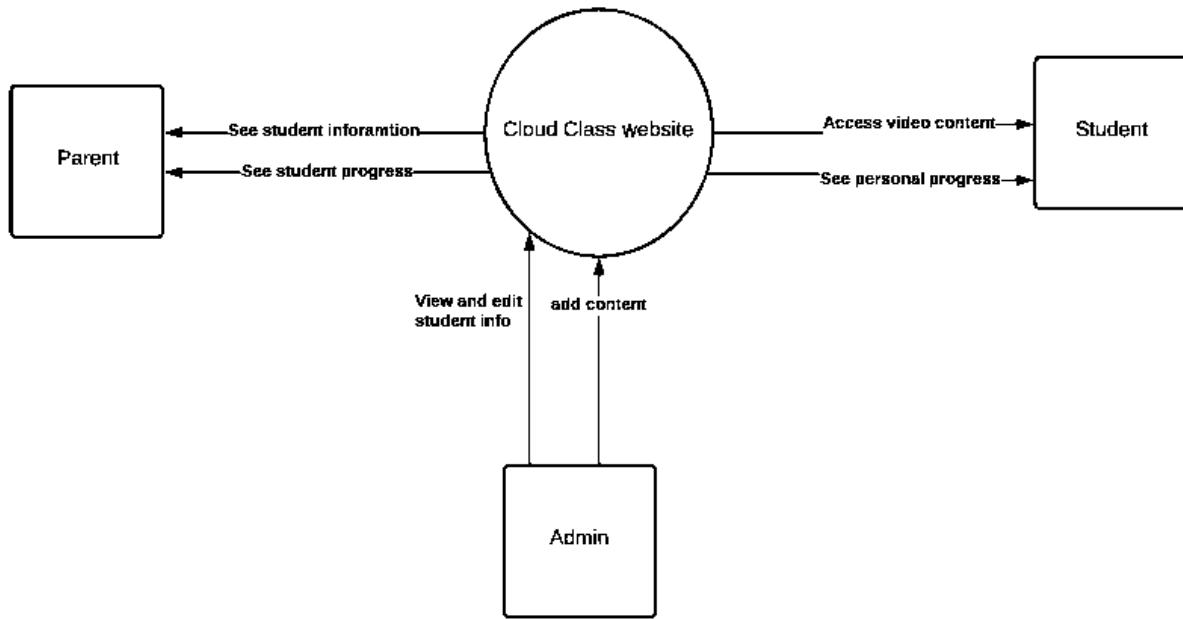
# **Chapter 4: Software Requirements Specifications (SRS)**

# 1. INTRODUCTION

## 1.1 Project Overview

The purpose of this project is to allow Jordanian elementary school level students to be able to learn more efficiently, the project intends to deliver a website that is easily accessible and offers a wide range of subjects for the student to be able to select through and track their learning, the project also intends to help parents understand the current level of their student and find their weak points

## 2. Context Diagram



Context diagrams show the interactions between a system and other actors (external factors) with which the system is designed to interface. As we see here the Three actors that will be interacting with the system are the student, parent, and admin. We can see that the system will only output to the parent and student meaning they are taking in information, but the admin will be inputting it into the system.

## 3. SPECIFIC REQUIREMENTS

This section of the SRS contains all of the software requirements to a level of detail sufficient to

1. enable the SRS to be checked by the originator of the original system requirements
2. enable us, designers, to be able to design a system to satisfy those requirements
3. Testers to test that the system satisfies those requirements.

There will be an emphasis on testability and no ambiguity for the system requirements

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## **Website User Requirements:**

NOTE: The user and system requirements are going to be read and identified with the format UR-(n) so for example, the first user requirement would be UR-1 and the second UR-2, etc...and the first system requirement would be SR-1 and under it would be SR-1.1, etc

### **Actor:**

Student:

- UR-1 The student should create an account within the account Each account is for a student.
- UR-2 Students can edit the account information
- UR-3 The student is able to browse through topics(classes)
- UR-4 The student is able to select a topic and browse
- UR-5 The student is able to select subtopics
- UR-6 The student is able to watch videos on a specific subtopic
- UR-7 The Student is required to take a quiz
- UR-8 The quiz must display a result and tell the student if they have passed or failed
- UR-9 If the student doesn't pass the quiz should give an option for them to skip and come back later or see additional videos on the topic
- UR-10 The students shall be able to sign into his/her account.
- UR-11 The Students may disable or delete the profile
- UR-12 The Student is able to change their password
  - a. Parent
- UR-13 The parent should create an account within the account Each account is for the history of the child
- UR-14 The parent can edit the account,
- UR-15 The parent can set a notification for the exam of the child
- UR-16 The parent may disable or delete profile
- UR-17 The parent shall be able to see the rating of his child at any time.
- UR-18 Parents shall be able to view the Admin feedback comments about the child, at any time.
- UR-19 parent shall be able to sign-up to the application
- UR-20 parent shall be able to sign into his/her account
  - a. Admin
- UR-21 The admin should be allowed full access to the database
- UR-22 The Admin should be able to access all student information
- UR-23 The Admin should be able to know what parents are associated with what students
- UR-24 The Admin will allow sharing the grades with parents and students

- UR-25 The Admin can edit the account information
- UR-26 The Admin may disable or delete their profile
- UR-27 The Admin shall be able to sign into his/her account.

a. Mutual between Actors

- UR-28 The introduction page should describe fully what the website is about
- UR-29 The introduction page should contain signup and login options for each actor
- UR-30 The website should be user-friendly for children and parents
- UR-31 The website should be able to withstand the number of users from parents and students that will be using the website
- UR-32 The website should have a suitable top and sidebars for navigation
- UR-33 The website should include children-friendly pictures that engage the students in website
- UR-34 The website should be clear and concise when it comes to topics and subtopic selection preferably with images to intuitively understand what topics are being selected
- UR-35 The website should respond quickly to user interactions
- UR-36 The website should be secure when it comes to user passwords
- UR-37 The website should be able to run on all modern browsers
- UR-38 The website should have a mobile version that runs smoothly and with the same features on most mobile phones

## Website System Requirements:

### SR-1 Intro page

- SR-1.1. Contains information regarding what the site is about (Our goals and what we offer)
- SR-1.2. Contains a button to sign up that when pressed takes you to the signup page
- SR-1.3. Contains a button to log in that when pressed opens the login page
- SR-1.4. Contains images that will encourage children and give off the impression of a fun and colorful experience (the design will be done by the UX designer)
- SR-1.5. Contains a footer that has contact information and social media platforms

### SR-2 Login Page:

- SR-2.1. The page contains a signup button that takes you to the signup page (2)
- SR-2.2. the page contains an input field for the user name
- SR-2.3. the page contains an input field for the password
- SR-2.4. If the username and password match what's in the database and authentication is proven the user shall be sent to his required page (the parent page or student page)

### SR-3 Signup Page

- SR-3.1. the user selects if he is a student or a parent
- SR-3.2. this page requires the full information of the parent/student
  - SR-3.2.1. The information for parent sign-up includes name, email, student username and password, and a personal password.
  - SR-3.2.2. The information for student sign-up includes name, email, level of education (first grade, second grade, etc..)

### SR-4 student page

- SR-4.1. the student is prompted to a page that contains all the different topics with the topics they selected when signing up being at the top
- SR-4.2. The topics are to be displayed in square boxes giving clear access to all the topics
- SR-4.3. the student may click on the desired topic/subject
  - SR-4.3.1. the student is then prompted to a page that contains videos on what they selected.
    - SR-4.3.1.1. the student can pause to continue the video later
      - SR-4.3.1.1.1. when the user finishes the video (the time of the video is complete) they will be prompted with a quiz or will be able to do the quiz whenever
      - SR-4.3.1.1.2. The quiz will be on the video they just finished

- SR-4.3.1.1.3. The user will be given his result when he submits the quiz
- SR-4.3.1.1.4. The quiz will have a leaderboard
- SR-4.3.1.1.5. He will then be able to go to the next video or press
- SR-4.3.1.1.6. If the student decides to move to the next subtopic they will be taken to the next lecture

#### SR-5 Parent page

- SR-5.1. The page must associate the correct student with parent
- SR-5.2. The page must display the information about the student's
- SR-5.3. The page must contain the results of the student associated with the account,
- SR-5.4. statistics about how their student compares to other subjects they've attended
- SR-5.5. suggested weak points based on the student's result
- SR-5.6. There will be a progress bar showing how much of the topic the associated student has completed (for example a progress bar that states 43% for math, and under it another progress bar that states 88% for English)

#### SR-6 Admin Page (entered when admin user name and password are submitted note: does not matter if student or parent option clicked after clicking login, the admin username and password should be recognized)

- SR-6.1. Info page (contains a search bar to be able to search for a student and get their information)
- SR-6.2. can add students or parents
- SR-6.3. can delete student or parents
- SR-6.4. can provide an easy and efficient way to access the database
- SR-6.5. can help parents or students if they need to UPDATE information
- SR-6.6. does basic CRUD operations

#### SR-7 SideBar

- SR-7.1. The sidebar will be will collapse and retract when clicked on it
- SR-7.2. The icon for the sidebar will be on the top bar it'll open and close when clicked on
- SR-7.3. The sidebar contains a button for settings that takes you to the user settings/info
- SR-7.4. The sidebar must welcome the user
- SR-7.5. The sidebar must allow user to search youtube for quick access to more videos
- SR-7.6. The sidebar must show todays date
- SR-7.7. The sidebar contains a button that takes you to the main page or dashboard
- SR-7.8. The sidebar contains a button that allows you to log out
- SR-7.9. The sidebar contains an option to allow you to change the password

SR-8 Top bar

- SR-8.1. The top bar will be prominent in the STUDENT PAGE to show students a progress bar of how many videos they have watched
- SR-8.2. The top bar will contain an icon that shows the student's profile picture

## 3.1 External Interface Requirements

### 3.1.1 User Interfaces

The screens included are:

- A start page that contains the login page
- A signup page
- A student page
- A parent page
- An admin page

All the screens will follow a format similar to each other, there will be a top bar and sidebar that takes you to where you need to go

The screens will fill up the screen completely and be adaptive to different screen sizes

The website must be mobile optimized meaning that if opened on a mobile phone the text will be clear and no functionality will be compromised

For the mobile version of the website, the top and sidebar shall function just as in the website, meaning they will collapse and expand with the content on the page.

### **3.1.2 Software Interfaces**

This should specify the use of other required software which your software must interface

Browser Interface:

The website will be able to run on all the modern browsers including Google Chrome, Microsoft Edge, Firefox, and opera the features in the website shall not be changed depending on what browser the website will run on

Database interface:

The website shall be connected to a database (\*\*still not decided which to use\*\*) which will store the student parent and admin information, the database will also contain links to the videos that will be used in the student page, the website will interact with the database to retrieve video links and play them seamlessly in the browser, the admin may also be able to add into the database using an onscreen form. The database will save the results of the students to display them for the parents and compare between all students

## **2.2 Software Product Features**

For the product features are main goals are to try to have as many of the user requirements implemented as possible.

The musts are the existence of the database, the student and parent being able to signup and log in the admin having as much functionality as possible,

meeting basic CRUD operations with proper testing and validation, and having a quiz that works in a way to watch videos.

the website must also go to the specific site based on the user, for example, a student in first grade should be redirected to the first-grade student page when logging in whereas a 7th grader should be directed to their desired page

## 2.3 Software System Attributes

### 2.3.1 Reliability

The system will allow users to use the entirety of the system with the main functional requirements working at least at a 95% success rate. This means that out of every 100 users 95 of them will be able to complete a one-hour studying session process from as soon as they open the website to when they close it without any issues. This will not include any unreliability in external systems such as the database system

### 2.3.2 Availability

Specifying the required availability of the final software system:

The entirety of the website from logging in to watching videos and taking quizzes must be available at all times with a maximum allowed downtime of 10 seconds per day or 5 minutes per week. Whether this is of server issues, errors, or external system integration issues.

If a crash does happen the website should be saving the student's progress every 5 minutes which ensures that no more than 5 minutes of progress is lost

When systems are back online it is expected for the user to log in and continue from the last save point.

Specify the required availability of the final software system: define requirements such as checkpointing, recovery, and restart.

### 2.3.3 Security

Specifying the factors that protect the software from accidental or malicious access, use, modification, destruction, or disclosure:

After the website has been completed the servers should exist without vulnerabilities meaning that critical data (such as passwords) should be encrypted and the website has to be audited after finishing testing

Passwords must be encrypted using Advanced Encryption Standard (AES)

At 128 bits.

The website will be immune to SQL injection by using Parameterized queries

Parameterized queries are a means of pre-compiling an SQL statement so that you can then supply the parameters in order for the statement to be executed. This method makes it possible for the database to recognize the code and distinguish it from input data.

### **2.3.4 Maintainability**

This section specifies attributes of the software that relate to the ease of maintenance of the software itself.

The website will be built using an object-oriented technique ensuring the ease of maintainability, also any APIs used will be well documented and highly tested ensuring that they will not cause any difficulties in the future

The design of the website could be done using bootstrap for speed of changes and ease of maintainability

The functions in the code will be modular as in they will not have a high dependency on one another ensuring no error or bug cascading effect throughout the system, this will also be made sure of by object-oriented design

The courses can be added and maintained throughout the use of a prototype design pattern The Prototype pattern delegates the cloning process of courses to the actual objects that are being cloned. The pattern declares a common interface for all objects that support cloning. This interface lets you clone an object without coupling your code (which leads to code that is much less likely to fail and much more easy to maintain) to the class of that object. This means that you can add a bunch of courses and apply the small variations to each one without much effort

### **2.3.5 Portability**

Since we are building a website it is expected to run on any machine with browser capabilities including laptops, mobile phones (Browser), and computers

The website will be built using standard Javascript CSS and html5 which works on all modern browsers

### **2.3.6 Performance**

This subsection is specifying both the static and the dynamic numerical requirements placed on the software or on human interaction with the software as a whole.

The website must display each page fully within 5 seconds or less of the start of the page loading process (being when the user presses on a button that will require another page to be loaded)

The website should be able to withstand up to 1000 simultaneous users using it at the same time

The websites server should have a minimum of 1TB of storage to save the websites contents, images, and student information

## **2.4 Database Requirements**

This section is for specifying the logical requirements for any information that is to be placed into a database.

The DataBase should take in all needed information from either the student or the parent

This information includes but is not limited to

Parent

- Name
- Personal Email Address
- Contact Information (Phone Number)
- Which parent relates to which students

Student:

- Personal Email Address
- Name
- Password

- Grade

- Which students relate to which parent

Each student or parent should have unique identification for database usage

The student entity in the database should also contain and store information about the grades taken in each topic and the total watch time for each topic

This information will help the parent understand the student's level of understanding for each topic

The topic needs to have information stored about it like which subtopics relate to a specific topic

The subtopic needs to know which video is related to it as in the topic ID needs to know what video URL to display

The video entity will contain information about that video in particular with its primary key being the video URL, there will be a "how much of this video has been watched" field that will be summed up to know what the total amount of time that the student spent watching videos

The data entities will and their relationships are shown in further detail in an ERD diagram in the next chapter.

Accessing Capabilities include the fact the parent will be able to view student information and the admin will be able to view and modify all student or parent information

Integrity constraints include but are not limited to grades being INTEGERS, Emails following the specific order of [xxx@xxx.com](mailto:xxx@xxx.com), all primary keys must be UNIQUE

Video links must be a link.

- ▶ Passwords must be **at least 6 characters** long.

Example	Valid	Reason
---------	-------	--------

Xyz12	No	Password is only 5 characters long.
Xyz123	Yes	Password is 6 characters long.

► The password must contain at least **two character categories** among the following:

- Uppercase characters (A-Z)
- Lowercase characters (a-z)
- Digits (0-9)

Example	valid	Reason
abcdef	No	Password contains only one character category: digits and lowercase characters.
42abcdef	Yes	Password contains two-character categories: digits, lowercase characters,

the passwords must be at least 6 characters long and contain a combination of letters and numbers

as for else, the database manager will add integrity constraints as needed

## Traceability Matrix

The idea of a traceability matrix is to be able to clearly identify which system requirements are meeting which user requirements. the labeling can be referenced from above.

### Student Traceability Matrix

	ur 1	ur 2	ur 3	ur 4	ur 5	ur 6	ur 7	ur 8	ur 9	ur 10	ur 11	ur 12	ur 13	ur 14	ur 15	ur 16	ur 17	ur 18	ur 19
sr 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x					







## Parents Traceability Matrix

	ur 17	ur 18	ur 19	ur 20	ur 21	ur 22	ur 23	ur 24	ur 25	ur 26
sr 1										
sr 1.1										
sr 1.2										
sr 1.3										
sr 1.4										
sr 1.5										
sr 1.6										
sr 2									x	
sr 2.1									x	
sr 2.2	x									
sr 2.3									x	
sr 2.4									x	
sr 2.5									x	
sr 3	x									
sr 3.1	x									
sr 3.2	x									
sr 3.2.1	x									
sr 3.2.2										
sr 4										

sr 4.1											
sr 4.2											
sr 4.3											
sr 4.4											
sr 4.4.1											
sr 4.4.1.1											
sr 4.4.1.2											
sr 4.4.1.2.1											
sr 4.4.1.2.2											
sr 4.4.1.2.3											
sr 4.4.1.2.4											
sr 4.4.1.2.5											
sr 5									x		
sr 5.1								x			
sr 5.2								x			
sr 5.3								x			
sr 5.4								x			
sr 5.5								x			
sr 5.6									x		
sr 6											
sr 6.1											

sr 6.2											
sr 6.3											
sr 6.3.1											
sr 6.3.2											
sr 7		x									
sr 7.1		x									
sr 7.2		x									
sr 7.3			x								
sr 7.4											
sr 7.5											
sr 7.6											
sr 8											
sr 8.1											
sr 8.2											
sr 8.3											
sr 8.4											
sr 9			x	x	x						
sr 9.1			x	x	x						
sr 9.2			x	x	x						
sr 9.3											
sr 9.4											

## Admin Traceability Matrix

	ur 27	ur 28	ur 29	ur 30	ur 31	ur 32	ur 33	ur 34	ur 35	ur 36	ur 37
sr 1											
sr 1.1											
sr 1.2											
sr 1.3											
sr 1.4											
sr 1.5											
sr 1.6											
sr 2							x				
sr 2.1							x				
sr 2.2											
sr 2.3							x				
sr 2.4							x				
sr 2.5							x				
sr 3											
sr 3.1											
sr 3.2											
sr 3.2.1											
sr 3.2.2											
sr 4											
sr 4.1											
sr 4.2											

sr 4.3											
sr 4.4											
sr 4.4.1											
sr 4.4.1.1											
sr 4.4.1.2											
sr 4.4.1.2. 1											
sr 4.4.1.2. 2											
sr 4.4.1.2. 3											
sr 4.4.1.2. 4											
sr 4.4.1.2. 5											
sr 5											
sr 5.1											
sr 5.2											
sr 5.3											
sr 5.4											
sr 5.5											
sr 5.6											

sr 6							x	x	x	
sr 6.1							x	x	x	
sr 6.2	x	x	x	x			x	x	x	
sr 6.3	x						x	x		
sr 6.3.1	x	x					x	x		
sr 6.3.2				x						
sr 7				x						
sr 7.1				x						
sr 7.2				x						
sr 7.3					x					
sr 7.4										
sr 7.5										
sr 7.6										
sr 8										
sr 8.1										
sr 8.2										
sr 8.3										
sr 8.4										
sr 9				x	x					
sr 9.1				x	x					
sr 9.2				x	x					
sr 9.3				x	x					
sr 9.4				x	x					

## Mutual Actor Traceability Matrix

	ur 37	ur 38	ur 39	ur 40	ur 41	ur 42	ur 43	ur 44	ur 45	ur 46	ur 47
sr 1	x										
sr 1.1	x										
sr 1.2		x									
sr 1.3		x									
sr 1.4											
sr 1.5											
sr 1.6											
sr 2											
sr 2.1											
sr 2.2											
sr 2.3											
sr 2.4											
sr 2.5											
sr 3											
sr 3.1											
sr 3.2											
sr 3.2.1											
sr 3.2.2											
sr 4											
sr 4.1											

sr 4.2												
sr 4.3												
sr 4.4												
sr 4.4.1												
sr 4.4.1.1												
sr 4.4.1.2												
sr 4.4.1.2. 1												
sr 4.4.1.2. 2												
sr 4.4.1.2. 3												
sr 4.4.1.2. 4												
sr 4.4.1.2. 5												
sr 5												
sr 5.1												
sr 5.2												
sr 5.3												
sr 5.4												
sr 5.5												

sr 5.6												
sr 6												
sr 6.1												
sr 6.2												
sr 6.3												
sr 6.3.1												
sr 6.3.2												
sr 7							x					
sr 7.1												
sr 7.2												
sr 7.3												
sr 7.4												
sr 7.5												
sr 7.6												
sr 8							x					
sr 8.1												
sr 8.2												
sr 8.3												
sr 8.4												
sr 9												
sr 9.1												
sr 9.2												
sr 9.3												

sr 9.4											
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# **Chapter 5: Software Design Description (SDD)**

Relevant IEEE standards: IEEE-1016[8]

## **1. INTRODUCTION**

The SDD shows how our software will be structured to satisfy the requirements. It describes the software structure, software components, interfaces, and data necessary for the implementation phase. In a complete SDD, each requirement must be traceable to one or more components.

### **1.1 Design Overview**

We have decided to follow the incremental design approach as we feel that our requirements are dynamic, they tend to change over time, and they are performed once for a given increment.

Give a description of the design approach, highlighting essential features that allow the design to meet the stated requirements.

## **2. SYSTEM ARCHITECTURAL DESIGN**

### **2.1 Chosen System Architecture**

Describe the system architectural design, identifying the major component groupings and the interfaces (both internal and external). Make sure to identify any significant technical risks, and identify contingency plans for each.

### **2.2 Discussion of Alternative Designs**

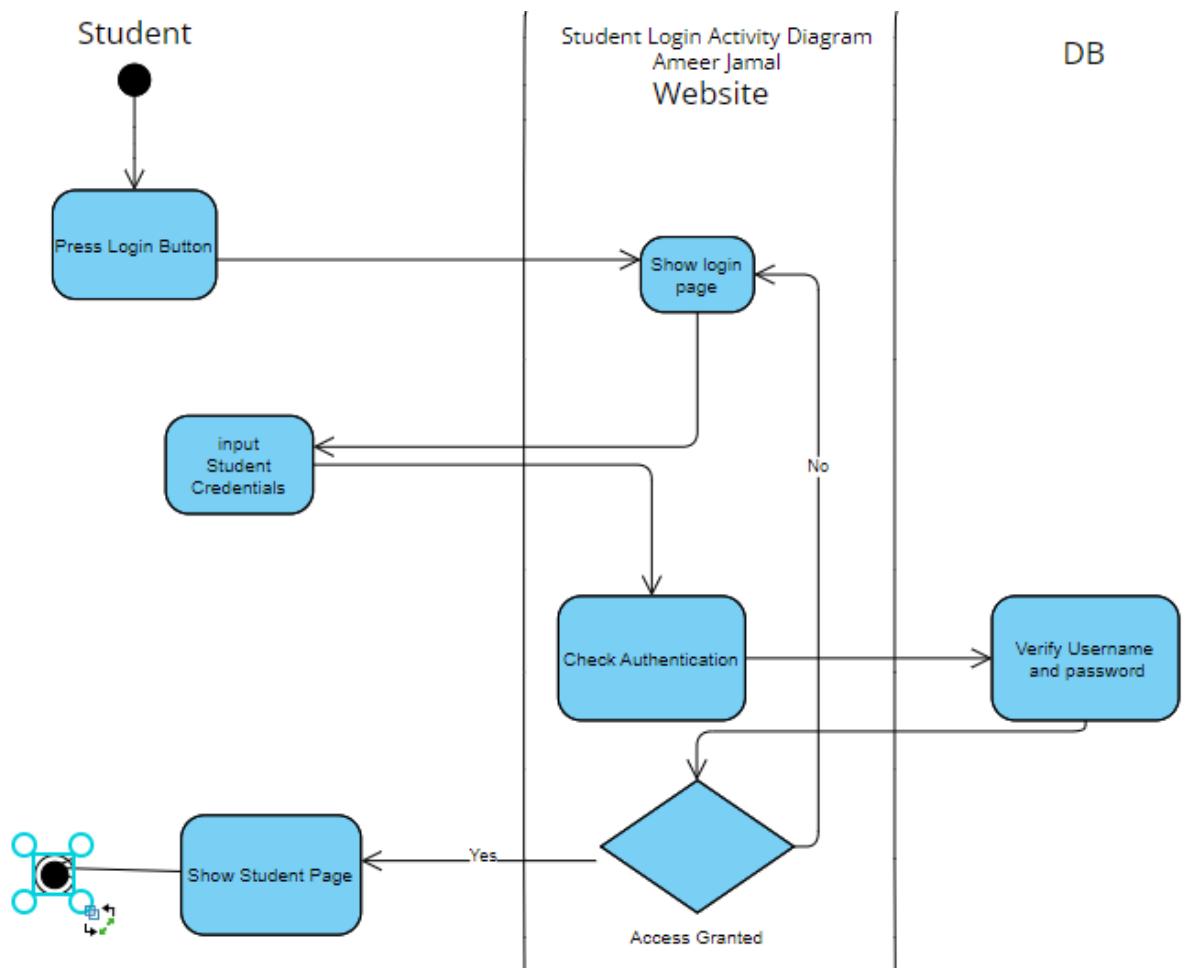
Discuss in a reasonable level of detail other design options explored, and the reasons for not choosing them.

## 2.3 System Interface Description

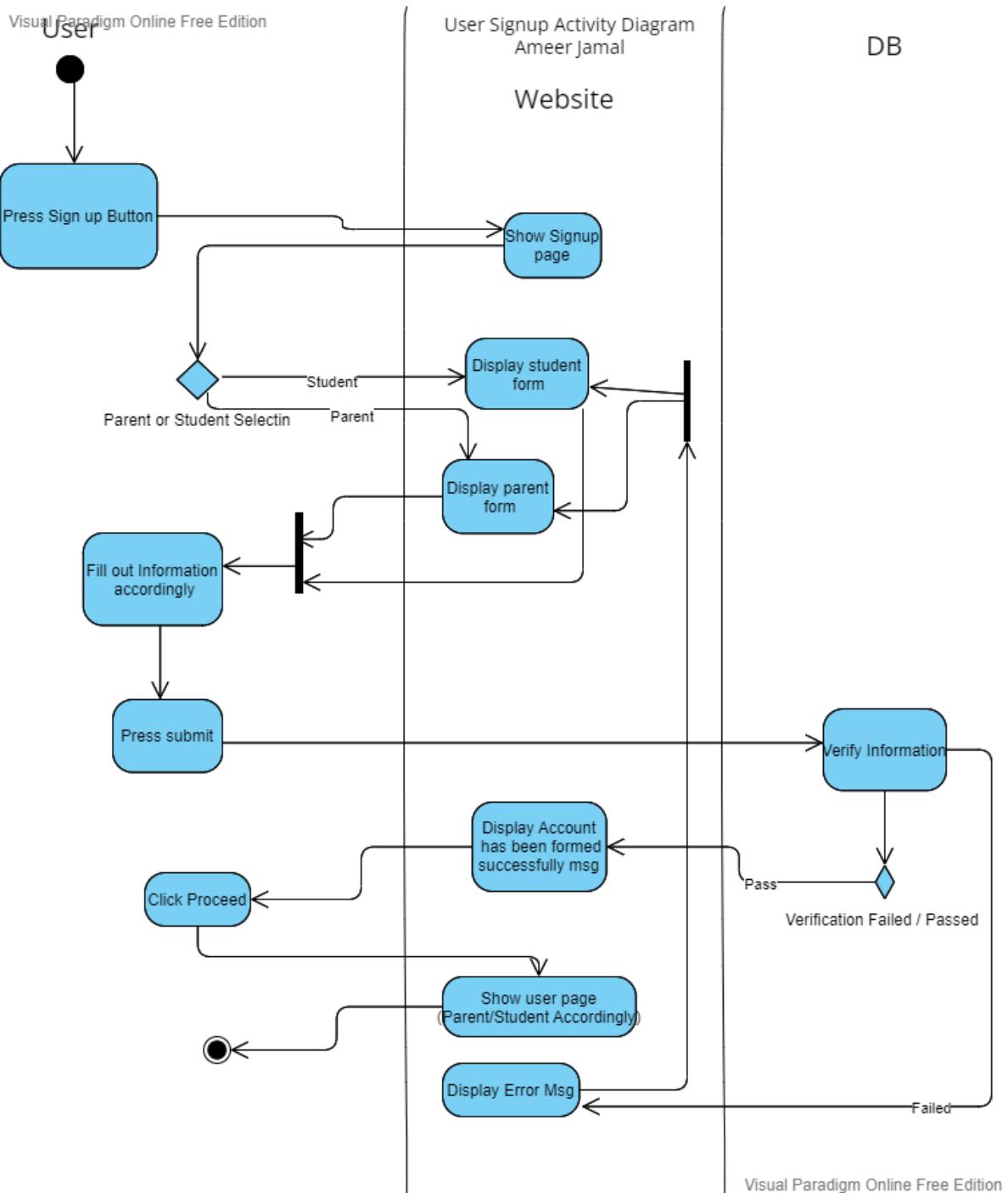
Describe the system interfaces in detail: O/S interface, files, networking, libraries, graphics libraries, etc. (Describe the user interface in section 4.)

## DETAILED DESCRIPTION OF COMPONENTS AND DIAGRAMS

### Activity Diagrams:

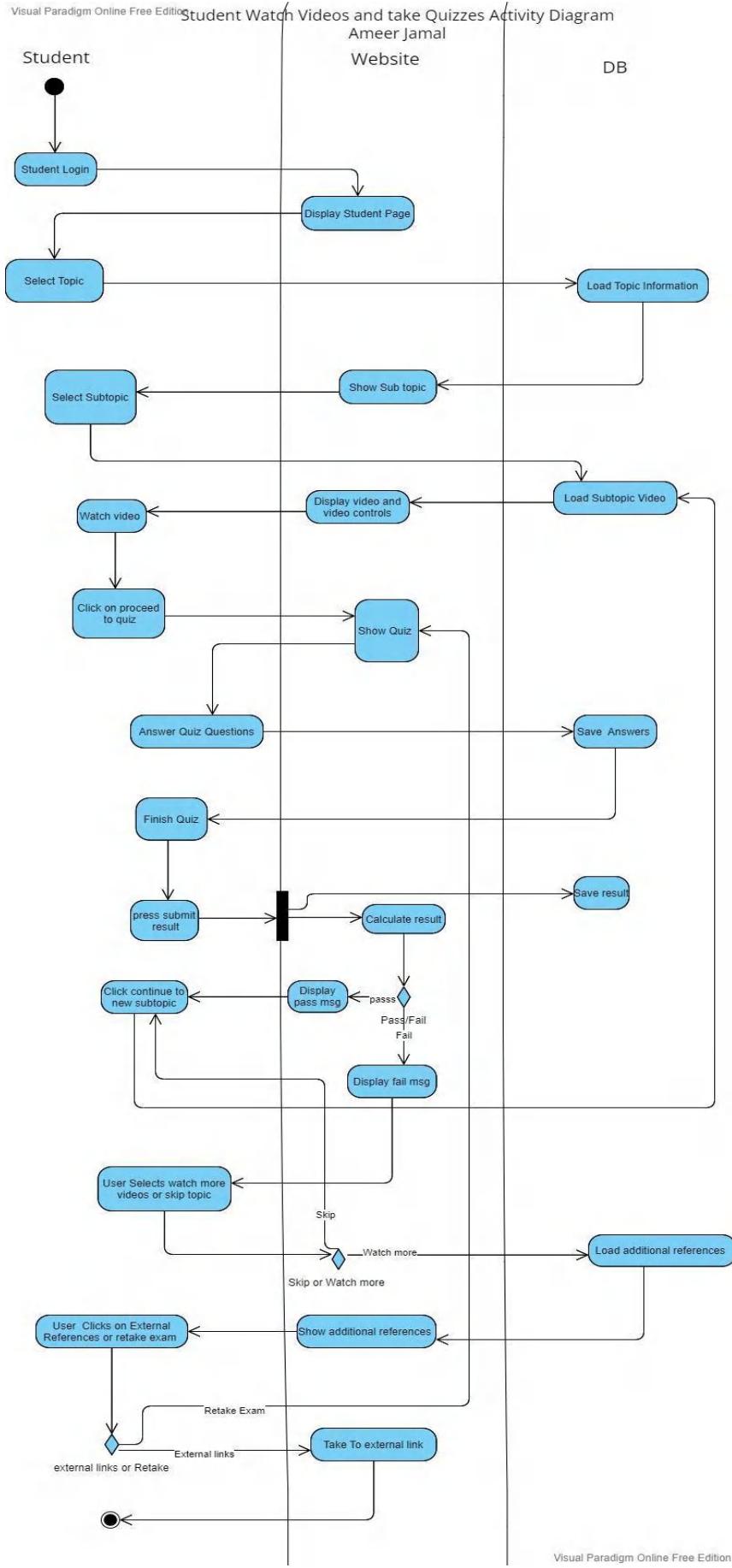


This activity diagram states that for a student to log in they must first press the login button on the website main page which will then show a login dialog that they can enter their credentials which will be authenticated by the DataBase and the backend of the website which will then either grant or deny the student access



This diagram represents the activities needed for a person to signup/ make an account. First, they will need to open the signup page from the website. Then, they will select if they are a parent or a student. The website will then display an appropriate form for the user to fill out. Once the user has filled out the information and pressed submit, the system will verify the information. If the verification fails, an error message will be displayed. If it passes, the user can click proceed to show the user page (parent or student accordingly). Finally, the process ends.

user to fill out and either make an account successfully or be displayed an error message

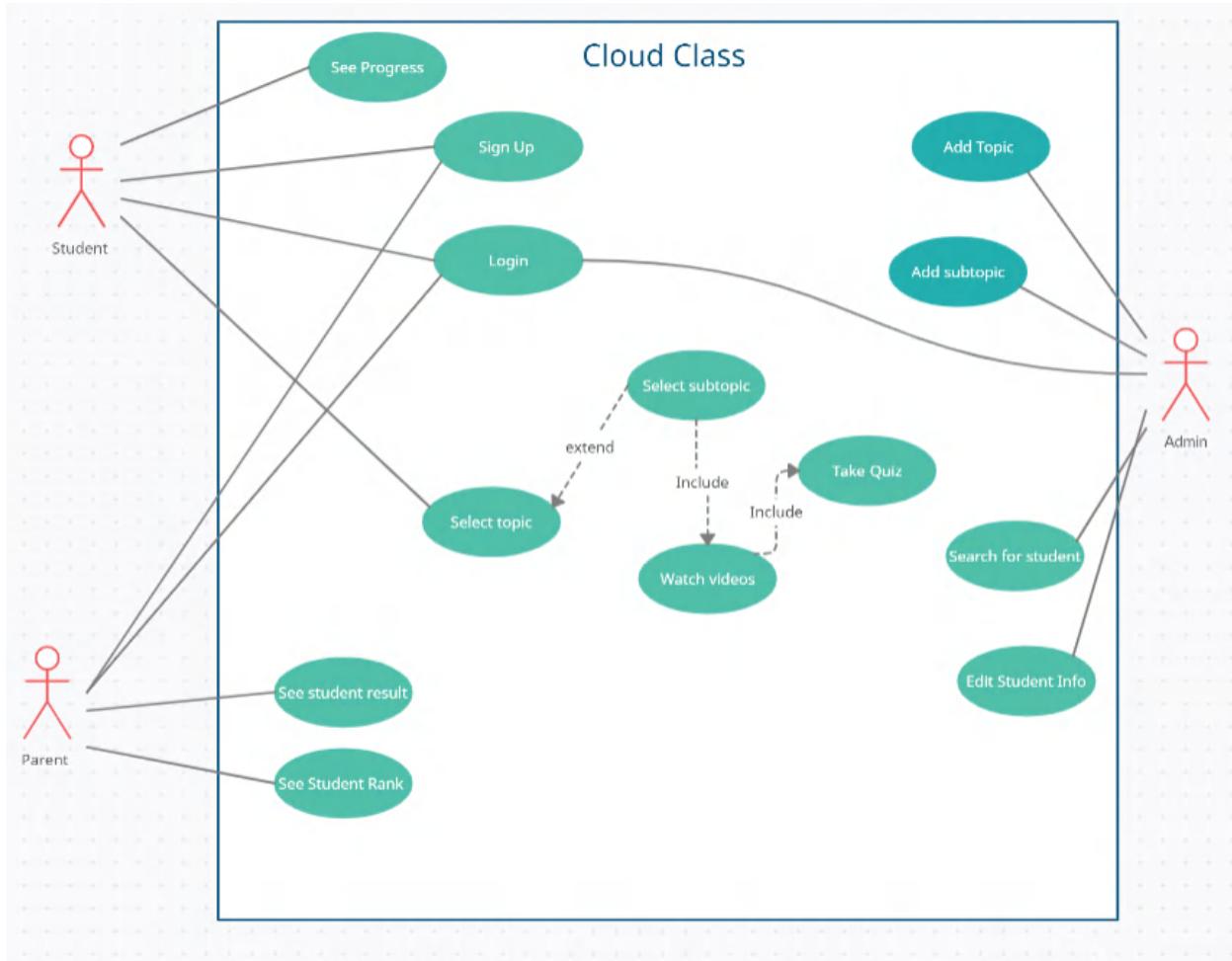


This diagram shows how a student may watch a video and/or take a quiz as we can see for the student to start the educational process they must first select a topic and then a subtopic which they then can proceed to watch a video about and then once they finish the video they can continue to attempt a short quiz where their answers will be stored in a database and the student can see their result

depending on the result the student can either pass the quiz and continue to the next subtopic or fail and skip the quiz also continuing to the next subtopic or they can ask for additional information to help them pass the quiz and then retake the quiz. finally, if the student asks for additional information they will be taken to an external link library which can give them more insight into the topic at hand.

---

## Use Case Diagram.:



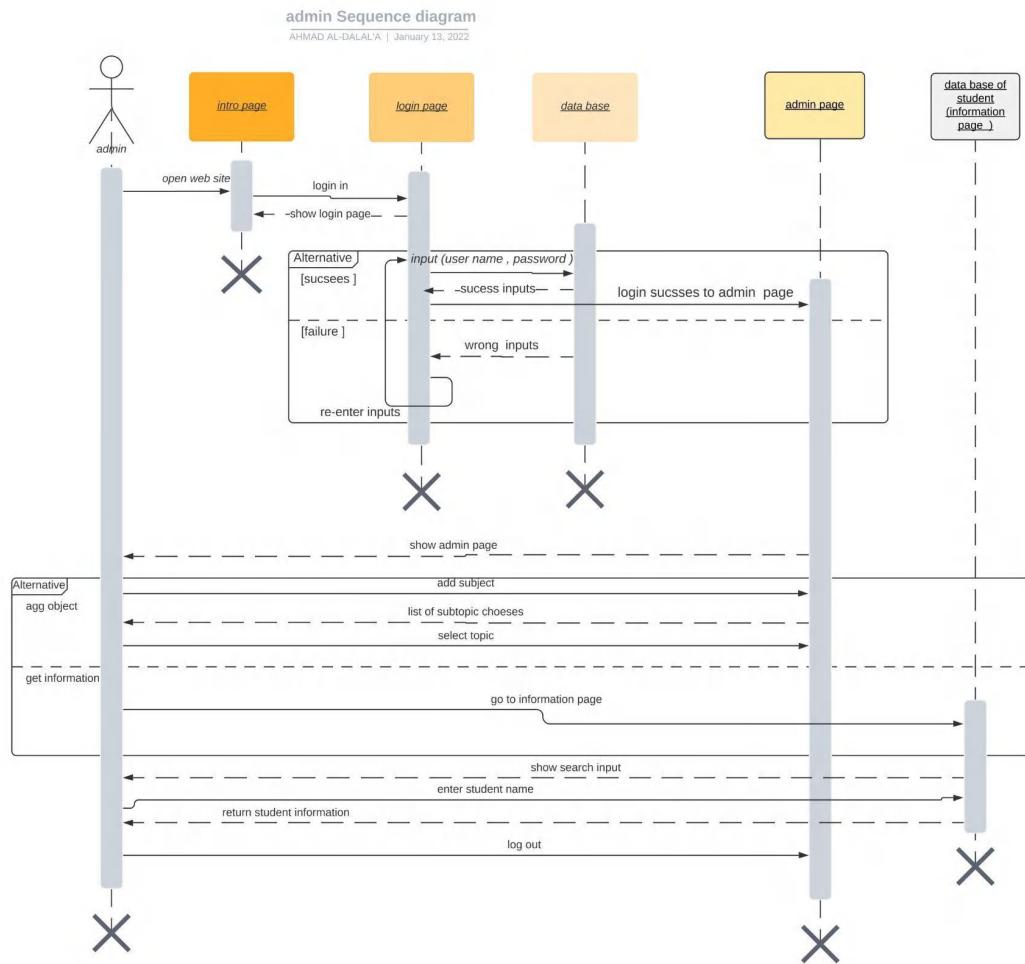
The actors in this diagram are the

- Student
- Parent
- Admin

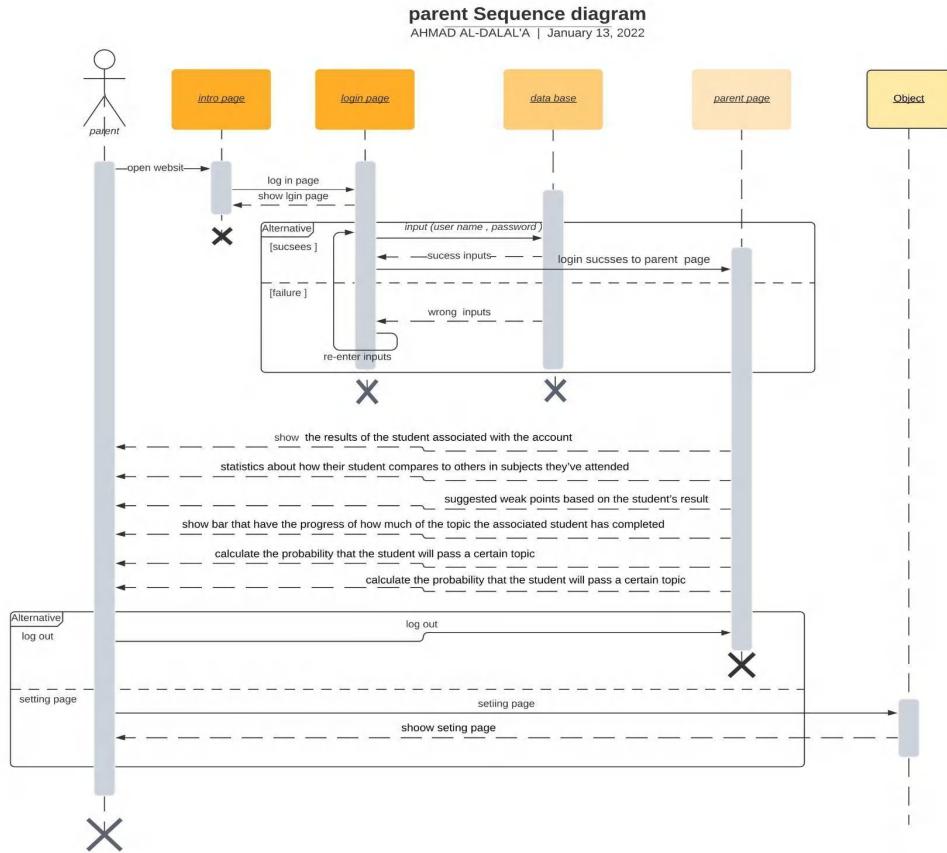
and from the diagram we can see that each actor has specific use cases which they can apply for example the admin can search for a student and edit the student info whereas the parent, for example, is not able to do this, meaning some use cases are exclusive to their respected actor whereas other use case's are shared

## Sequence Diagram :

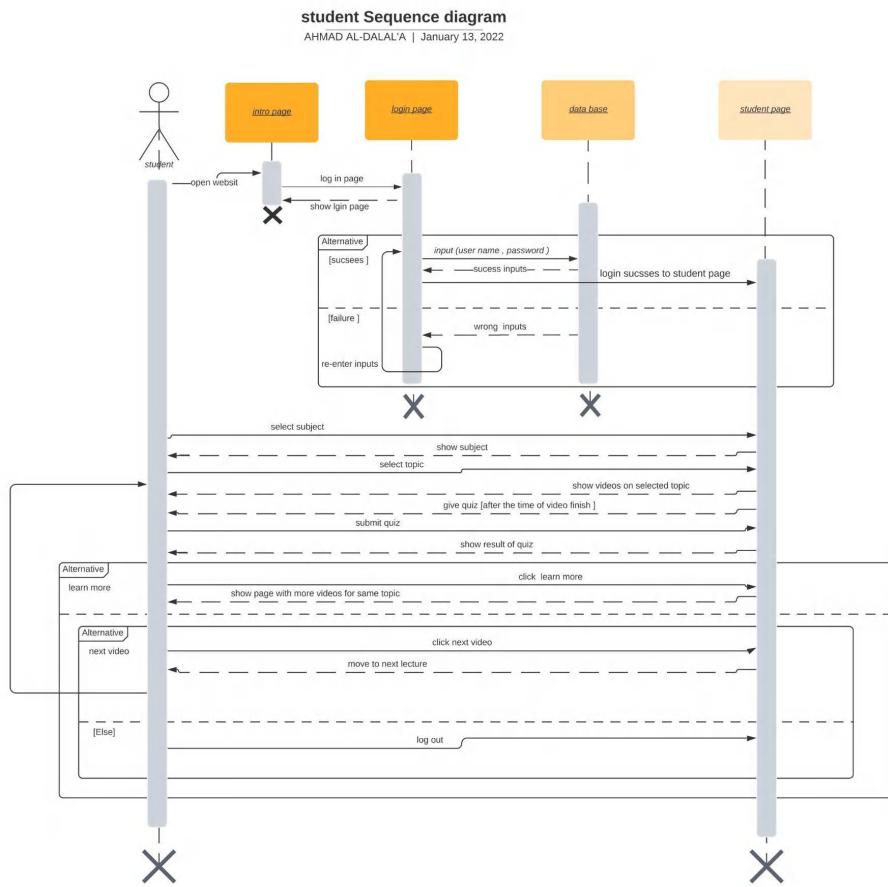
The diagram shows that when the admin wants to access their page



they need to follow a sequence of events starting with logging in successfully and then being able to for example add a topic or search for information, and we can also see that depending on what is selected there is an alternative set of actions carried out that represent the choice notice that the pages and database all need to interact with each other in order to fulfill the admin need successfully

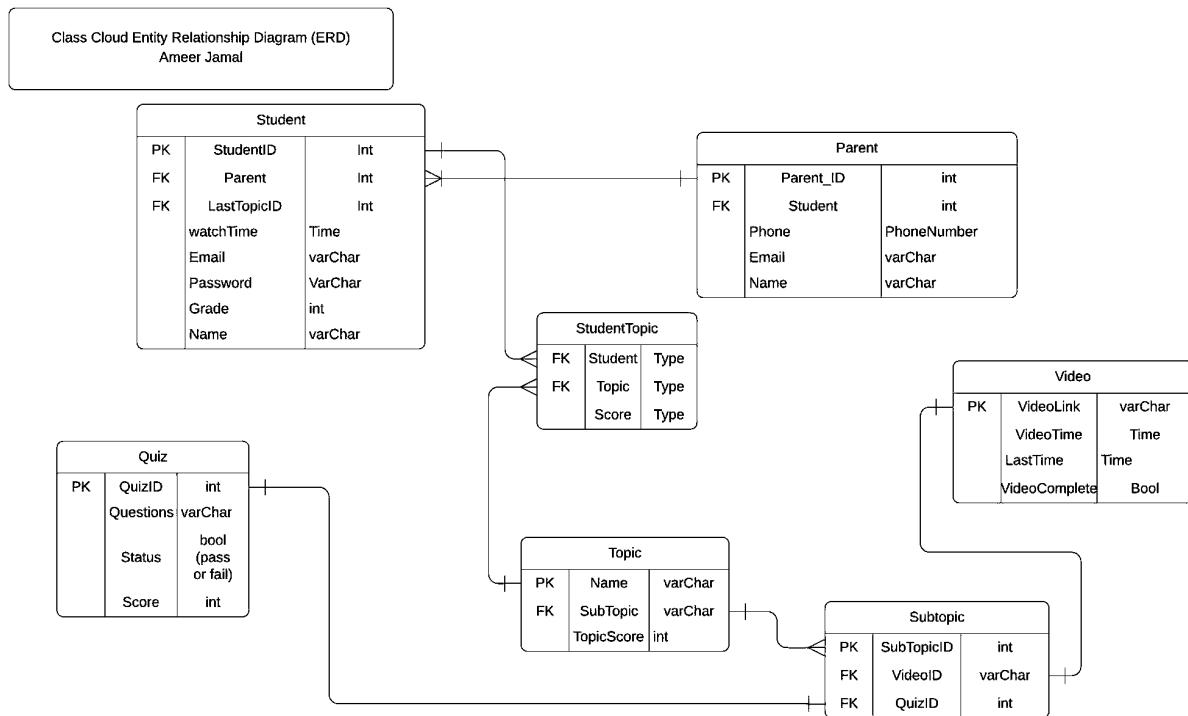


The diagram shows that when the parent wants to access their page they need to follow a sequence of events starting with logging in successfully and then the diagram tells us that the parent will be able to see the results of the student associated with the account and also different statistics about the student and their weaknesses, etc.. the diagram also shows that the parent can access the setting page



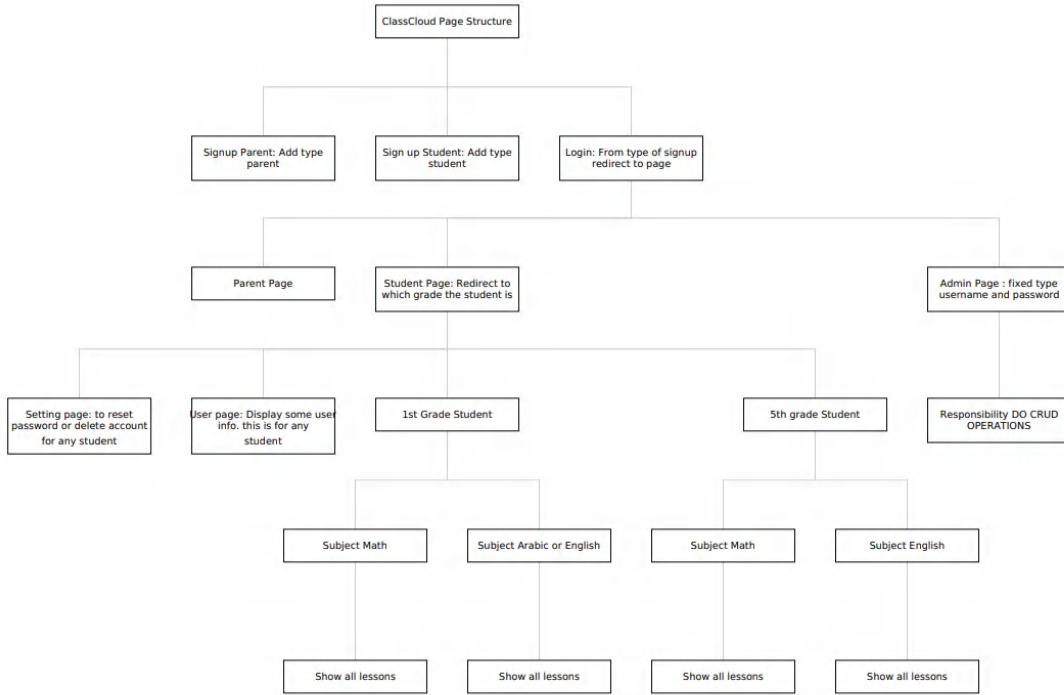
The diagram shows that when the admin wants to access their page they need to follow a sequence of events starting with logging in successfully. the student can then access topics and subtopics which and then be able to move to a quiz or the next topic, the diagram also shows that the student is able to logout when they are finished

## Database Design (ERD)



We can see from this diagram the database infrastructure there are multiple tables represented in the diagram like the Student, parent, quiz, video, topic, etc.. the diagram shows the relationship between the tables, the crowfeet represent many and the line represents 1, it also shows where the primary key and the foreign key are.

## Predicted Page Structure Layout :



## 3. USER INTERFACE DESIGN

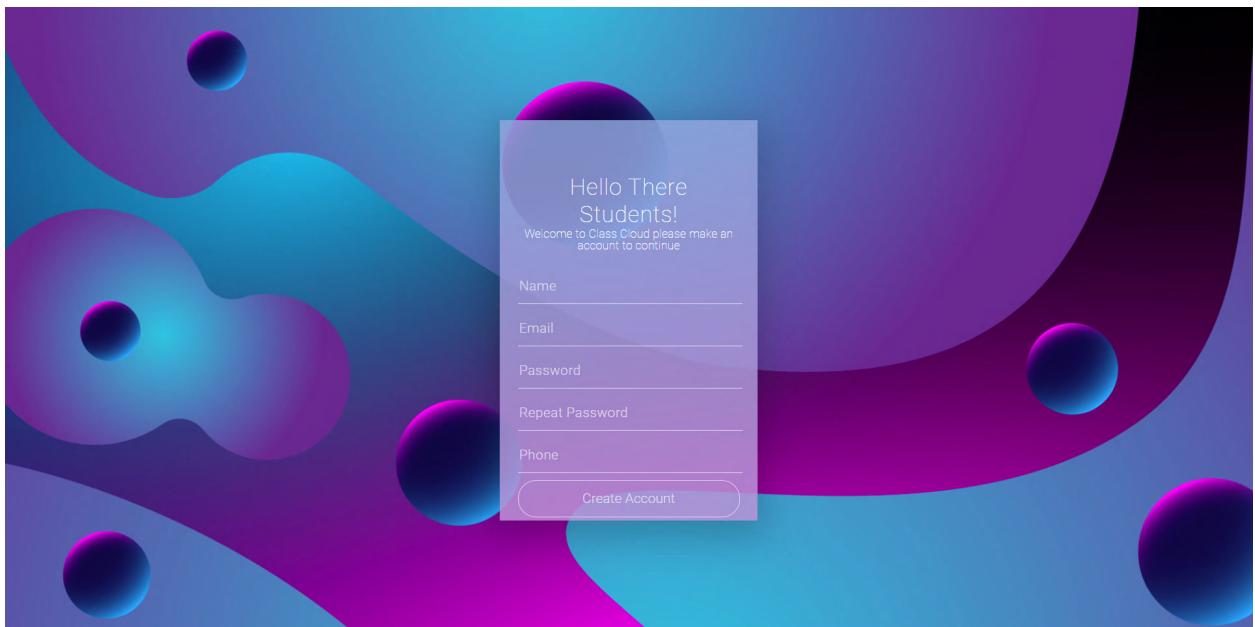
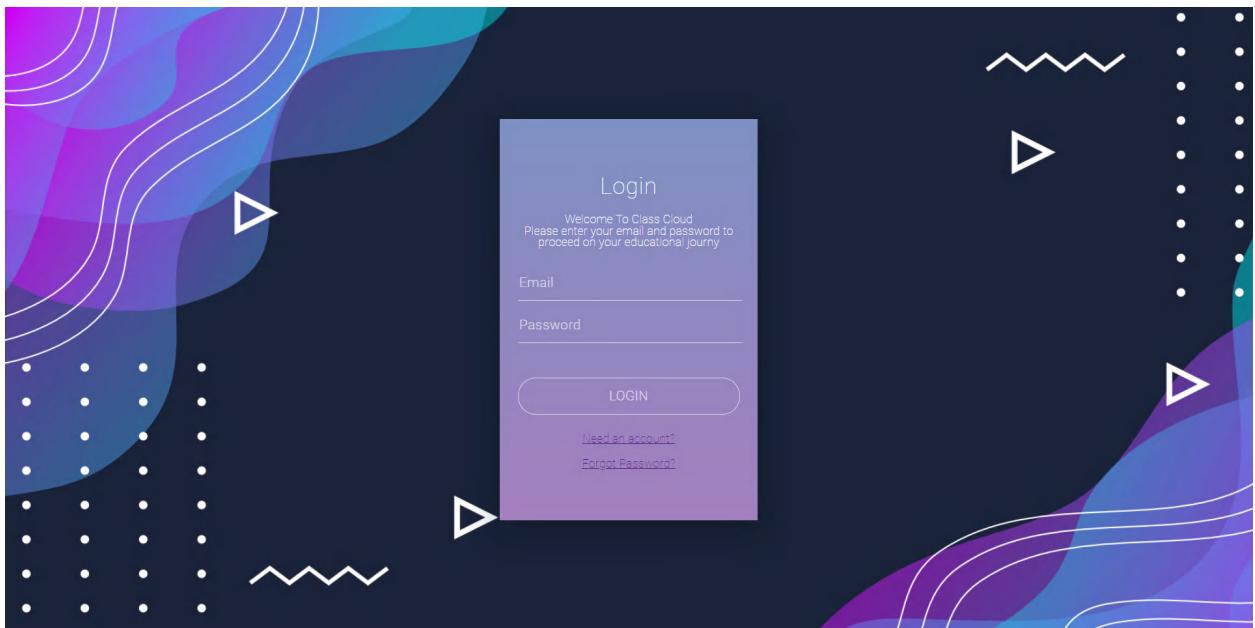
### 3.1 Description of the User Interface

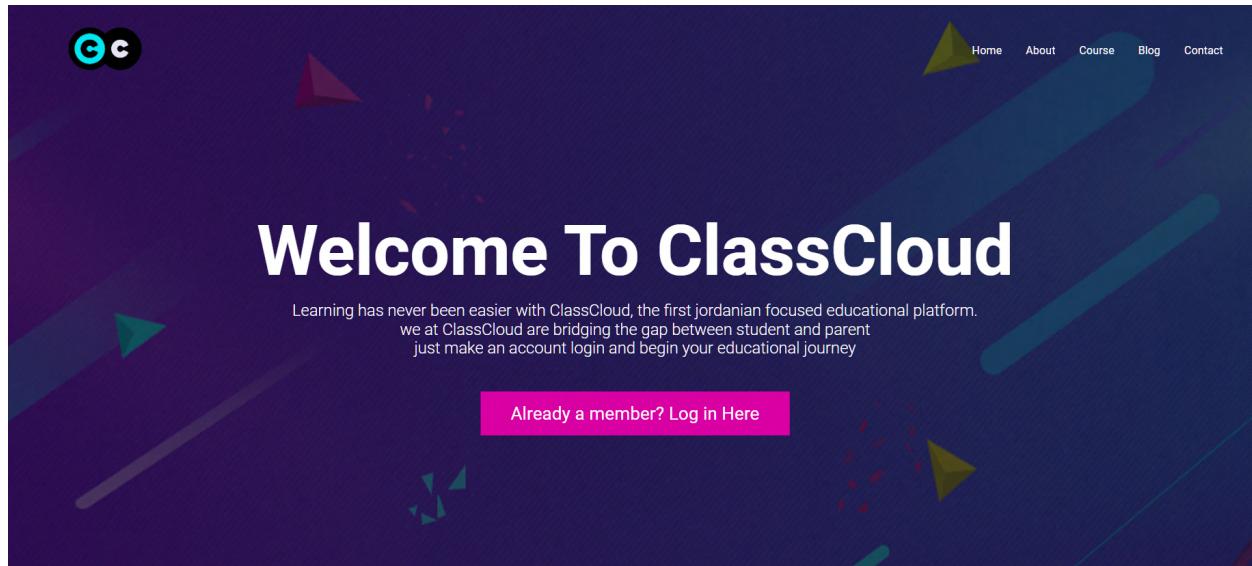
The user interface will be like a standard website, where you point and click on everything you want

the interface will start on the main index page which talks about our website and then leads you to sign in or log on-page, the website then takes you to the associate page from your log in information page which you then press and click on for what you want to do,

if the page is being opened on a touch screen device then the page interaction will be via touch, you touch where you want to go and the page takes you there

## Screen Images





## What we can help with

At ClassCloud we are looking to empower the youth at all times of their lives.

### Primary

ClassCloud is focused on primary level students between the first and 6th grade, as we believe with a good foundation our future youth can change the world, we strengthen kids on different materials such as Math, English, Arabic, And even art

### Intermediate

Its starting to get serious, with our Intermediate level students between the 7th and 10th grade we are aiming to provide core intermediary knowledge and provide them with key problem solving skills

### HighSchool and Tawjih

*Lorem ipsum, dolor sit amet consectetur adipisicing elit. Fugiat, illum, explicabo porro iusto, tenetur placeat cum sed quibusdam earum vel ea consectetur. Fugit quibusdam facere commodi accusantium reprehenderit incidentum numquam?*

## Our Vision

We are focused and determined to empower our future generation, by helping children and parents understand cooperate and move forward we at ClassCloud believe we can make a difference



## The Future Is in Your Hands

At ClassCloud we believe that combining new technology and teaching methods with traditional education can lead to huge jumps in academic performance. Not Convinced yet? give it a try for free, at ClassCloud we believe in an education for all



### Track yourself and See Your Progress

The separation and division of our educational videos and quizzes, you as a student can easily keep track of where you are and what you have ahead, leading to progression like no other



### Enabling Parents and Children to Learn Together

By linking up parents and children's accounts, as a parent you can identify where your child's strengths and weaknesses are, and keep up with where they are at, and as a student you can easily show and communicate where you are struggling and where you are excelling

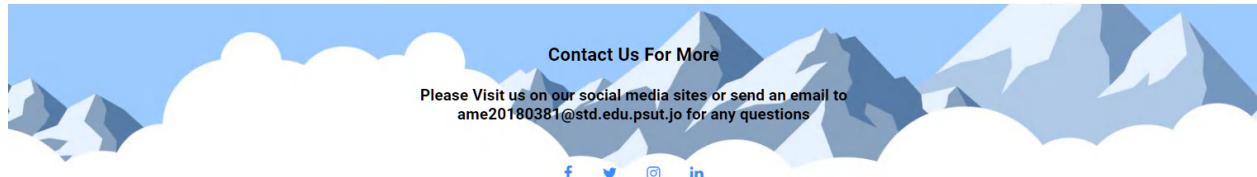


### Advanced and Effective

Our methods of allowing students to study at their own time with step by step guidance has proven to be an easy and effective way for students to improve their learning and ace those tests!

**So What are you waiting for?  
try ClassCloud Free Today**

[Sign Up Now](#)



Made with ❤ by the PSUT graduation team

html

## Mobile/Small screen View

Dimensions: Responsive ▾ 590 x 1000 80% ▾ No throttling ▾

# The Future Is in Your Hands

At ClassCloud we believe that combining new technology and teaching methods with traditional education can lead to huge jumps in academic performance.

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ensions: Responsive ▾

590

x 1000

80% ▾

No throttling



## Welcome To ClassCloud

Learning has never been easier with ClassCloud,  
the first jordanian focused educational platform.  
we at ClassCloud are bridging the gap between  
student and parent  
just make an account login and begin your  
educational journey

Already a member? [Log in Here](#)

Welcome Back Ameer Jamal

Dashboard All Resources Grades and Achievements

ClassCloud

Search Youtube..

- Dashboard
- User
- Settings
- Sign Out

Welcome Back Ameer Jamal

Dashboard All Resources Grades and Achievements

**Ameer Jamal**

A Proud Scholar

Today is:  
13 - July - 2022

Welcome Back Ameri

Dashboard All Resources Grades and Achievements

Mathematics Can be Fun!



Want to Test what you've learned?

Ready?

Play

HighScores

Made with  by the PSUT graduation team



# LeaderBoard

Here are your past scores

- 300
- 100

Back

Clear Scores

Question 1 of 4

Score

100

what is  $2 + 2$

A 2

B 4

C 5

D 3

## Objects and Actions

Identify all the objects on each screen and define the actions to be taken by each object for each event.

# **Chapter 6: Software Implementation**

## **Introduction to software implementation**

Here Based on the findings from the Requirements and Design phases, a detailed description of the development of the project will be shown, along with a detailed description of the Process Model used.

We will describe the overall strategy for implementation tasks, such as our incremental builds, and explain the reasons behind choosing the specific programming language, development tools, and the implementation platform.

We will also discuss the strategies for the reuse of existing products and components.

### **Incremental Building:**

ClassCloud was built using an incremental technique which is a process of software development where requirements are divided into multiple standalone modules of the software development cycle. In this model, each module goes through the requirements, design, implementation, and testing phases. Every subsequent release of the module adds a function to the previous release. The process continues until the complete system is achieved.

Our Increments:

We Have four main increments for ClassCloud

increment one: which involves the index page of our website

increment two: which involves the student page and is the biggest part of our website

increment three: which involves the parent page

increment four: which involves the Admin page

Here is a table describing what implementation tasks where, and the need for each implementation increment

Class Cloud	Front End	BackEnd	Other	Time estimated
Increment 1				2.5 weeks
	Finish Login Page	Initiate database tables	agree on color scheme	
	Finish Sign up Page design for student	make sure that signup adds to tables	agree on what database to use	
	Finish Sign up Page design for parent	make sure that login takes information from tables and uses it for authentication		
	Finish Home page design	make sure pages get redirected to correctly		
		figure out how to make a reset password feature		
Requirements needed to be done:	SR-1 to SR 3.2.2			
	Includes login page and			
	sign up page and intro page			
Increment 2				6 weeks
	Start with design of student page	make the database work with video content		
	make sure there is interactivity in page	find a way to track watch time from videos		
	make space for videos	find out how to connect student db with parent page analytics		
	design what subjects to make			
	make quizzes functional			
Requirements needed to be done:	SR-4 to SR 4.4.1.2.5			
	Includes everything to do with student page			

increment 3				1 week
	start the design of parent page	make database from student sync with parent		
	make graphs appear	find a way to integrate python for graph insertion		
	display critical information	make sure each parent is connected to a student		
Requirements needed to be done:	SR-5 to SR 5.5.			
	Includes everything to do with parent page			
increment 4				1.5 weeks
	Make admin page design	find out how to make website allow admin to change student info within website		
	make search box			
	make buttons for finding and editing student info			
Requirements needed to be done:	SR-6 to SR 6.3.2			
	Includes everything to do with Admin page			
Other Requirements	Will be implemented within increments like the top and sidebar, for example,			

# CLASS CLOUD

## INCREMENTS

### INCREMENT 1

Front end	Backend	Other
<ul style="list-style-type: none"><li>• Home Page</li><li>• Login page</li><li>• Signup Page for both parent and student</li><li>• choose between parent or student</li></ul>	<ul style="list-style-type: none"><li>• Make tables available for use</li><li>• have signup page input data to tables</li><li>• make sure login page reads data and authorizes account</li></ul>	<ul style="list-style-type: none"><li>• Work out color scheme</li><li>• work out which database to use</li><li>• see which requirements need changing</li></ul>

this is a figure to easily identify the main objectives of the first increment

## Coding languages used and libraries

ClassCloud is built on a WAMP stack with HTML5, CSS, JAVASCRIPT, and PHP as the languages that are being used.

These Languages are the fundamentals for any website or web application and provide extreme functionality for everything we need to do to build the website.

HTML: is what lets us markup a page meaning give it its basic outline

Javascript: is what gives us the functionality and responsiveness of the webpages

AJAX: a javascript library that lets us use javascript to interact with databases Asynchronously(meaning without having to refresh the page)

### **the wamp stack stands for**

Windows: version 10 the operating system we are running and building the website on.

Apache: a free and open-source cross-platform web server software

MySQL: an open-source relational database management system.

PHP: is a general-purpose scripting language that we are using to handle all our database interactions.

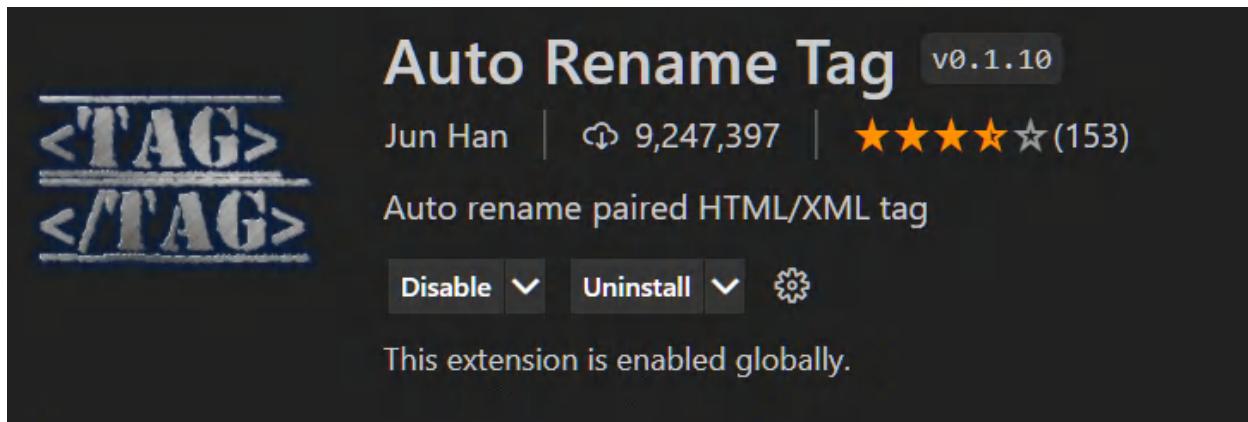
the web server we are using that allows the use of Apache and PHP and MySQL is called USBWebServer

## **Tools and environment**

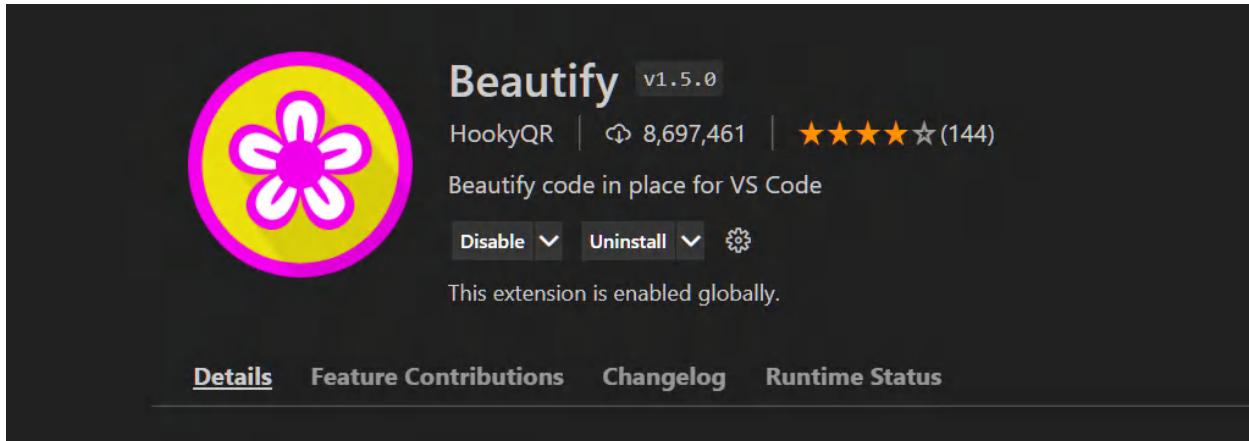
### **What we used to help us code:**

VSCode: we decided to use vs code as our code editor for the ease of use, the syntax highlighting for any coding language makes it easy to work on multiple things at once, also the extensive and ease of vs Extensions have helped us a lot through development

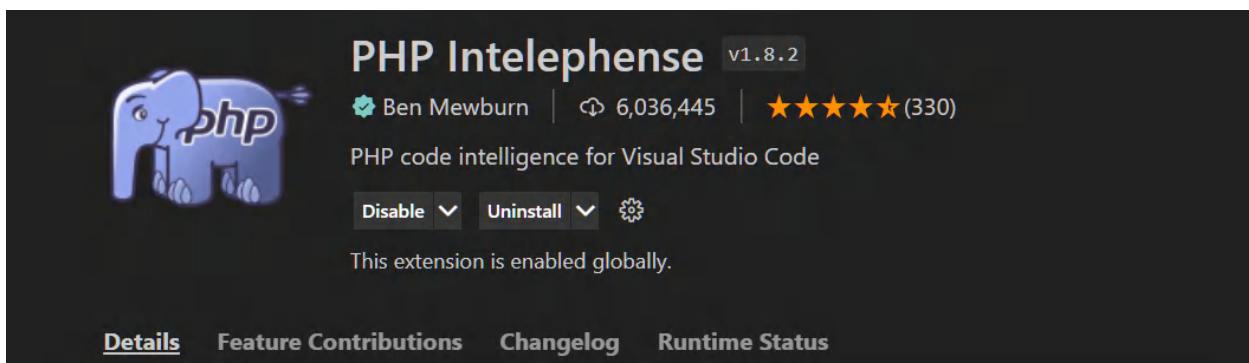
An example on these extensions include but are not limited to:



which quickly opens closes highlights and renames tabs for HTML.

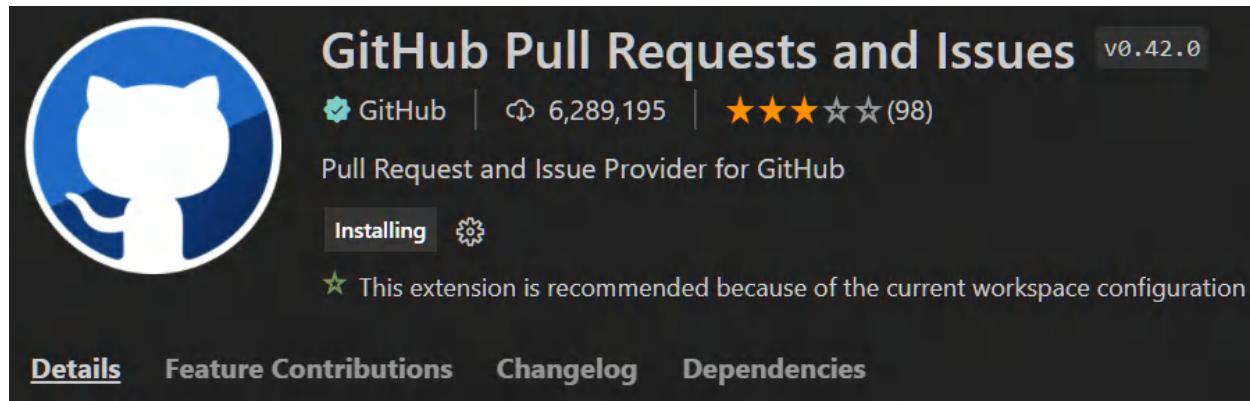


Which auto indents and fixes code structure making the code more readable.



Which gives us autocomplete based on smart algorithms and real-time code checks, speeding up the code development cycle.

GitHub: A source control system widely used by the technology industry, we used it to keep track of our personal work and send pull requests to be able to keep our code in a place where we can access it in any time, the extension below.



This extension with the understanding of GIT and Github helps make the task of pull requests and push requests much easier using its extensive GUI interface for such requests.



This GUI always us to easily select and know which branch we are on and merge where we need to merge

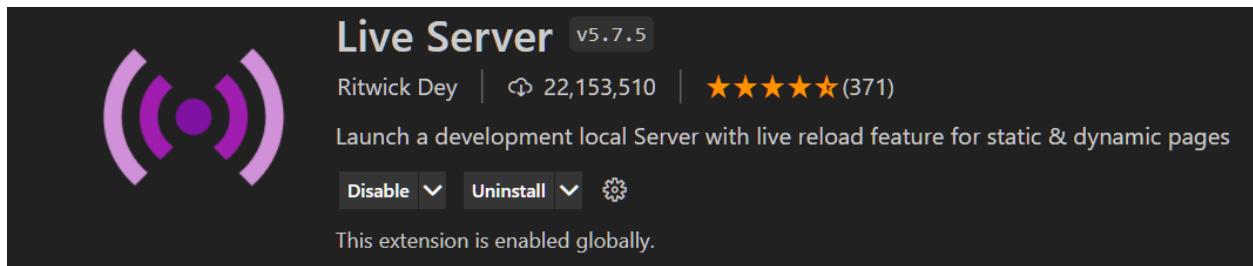
## Server Software



USBWebServer: is an extremely efficient, easy-to-use, and straightforward all-inclusive web server.

that allows us to have and use our critical webserver software: Apache, MySQL, PHP, and phpMyAdmin and be able to run the entire website from a flash drive if needed.

This program is a Free to use program that is relatively quick, and efficient and allowed us to get up and running with our website very quickly



This extension can be used when you don't want to open up the entire server and do HTML JS or CSS-related tasks quickly and efficiently, as it auto-updates the page you are working on with every save and runs near instantly.

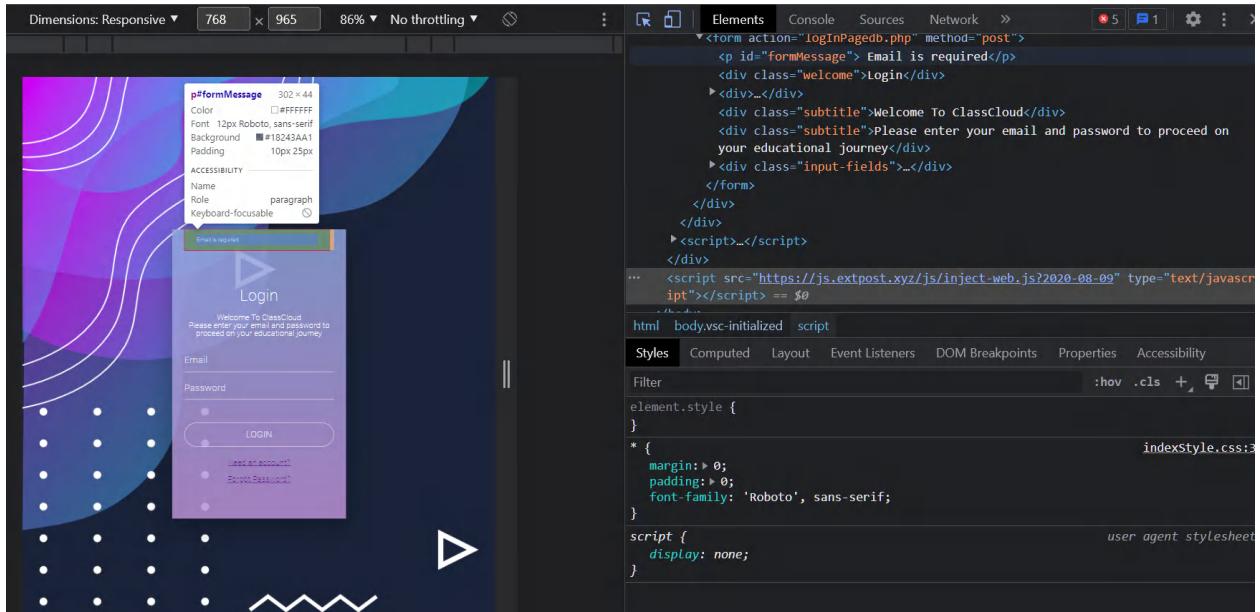
The screenshot shows the phpMyAdmin interface. The left sidebar shows databases: 'classclouddb' and 'test'. The main area shows a query in the SQL tab: 'SELECT \* FROM `students` LIMIT 0 , 30'. Below the query, the results are displayed in a table with columns 'name' and 'email'. The table contains the following data:

	name	email
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Ameer Jamal	aaa@aaa.com
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	abdullah	abd@gmail.com
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	asd	afdsfsd@asd.asd
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	ahmad dalala	ah@gmail.com
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	ahmad	ahmad@gmail.com
<input type="checkbox"/> <a href="#">Edit</a> <a href="#">Copy</a> <a href="#">Delete</a>	Ameer Mamoun Jamal	ame20180381@std.psut.edu.io

PHPMyAdmin: is a free software tool written in PHP, intended to handle the administration of MySQL over the Web

MySQL: is an open-source relational database management system that is lightweight yet extremely powerful for all the requirements we are trying to implement.

Chrome Web Browser, and its development tools: which from research has shown to be the most widely known and used web browser and supports all the HTML CSS JS and PHP features we need to run the website properly



The chrome web developer tools allowed us to quickly debug and understand our code, giving us a realtime display of whats going on, and logging each function allows us to track a problem and even properly target a CSS element

## The code behind it all

Snippets and how we maximized the reusability of our code.

### Index Page:

The pages for our home page are divided into sections, where each section represents what we are trying to inform the user , Here is a snippet of this:

```
<!--Courses-->

<section class="course">

  <h1>What we can help with</h1>

  <p>At ClassCloud we are looking to empower the youth at all times of their lives.</p>


```

```
<div class="row">

    <div class="course-col">

        <h3>Primary</h3>

        <p>ClassCloud is focused on primary level students between the first and 6th grade, as we believe with a good foundation our future youth can change the world, we strengthen kids on different materials such as Math, English, Arabic, And even art</p>

    </div>

    <div class="course-col">

        <h3>Intermediate</h3>

        <p>Its starting to get serious, with our Intermediate level students between the 7th and 10th grade we are aiming to provide core intermediary knowledge and provide them with key problem solving skills</p>

    </div>

    <div class="course-col">

        <h3>HighSchool and Tawjihi</h3>

        <p>Lorem ipsum, dolor sit amet consectetur adipisicing elit. Fugiat, illum, explicabo porro iusto, tenetur placeat cum sed quibusdam earum vel ea consectetur. Fugit quibusdam facere commodi accusantium reprehenderit incidentum numquam?</p>

    </div>

</div>

</section>
```

```

<!--vision-->

<section class="vision">

    <h1> Our Vision </h1>

    <p>We are focused and determined to empower our future generation, by helping children and parents understand cooperate and move forward we at ClassCloud believe we can make a difference </p>

    <div class="row">

        <div class="vision-col">

            <div class="layer">

                <h3>EXCITING</h3>

            </div>

        </div>

        <div class="vision-col">

            <div class="layer">

                <h3>EMPOWERING</h3>

            </div>

        </div>

    </div>

```

```

<div class="vision-col">
  
  <div class="layer">
    <h3>INTERACTIVE</h3>
  </div>
</div>
</section>

```

as we see here the section allow us to be able to heavily stylize each section correspondingly using CSS which will show more of down below, the idea is by defining these sections and divs we can reuse CSS elements on different sections where necessary we will be following a similar technique throughout most of the project, by using divs or sections to correctly align, display, and stylize the what we are trying to show the user.

for some of the images we are using static links as sources as this way we can let the website display the proper images without having them on our workspace/server, this can save space and also allow a delegation of hosting to the website where we are getting the image from.

As we also see we are using Emmet in Visual Studio Code which comes built in and allows quick input of Lorem text for space holders until we fill them out ,and also quick building of lists or divs or any other autocompleting needs to speed up productivity.

## CSS for this section

```
.course{  
    width:80%;  
    margin: auto;  
    text-align: center;  
    padding-top: 100px;  
}  
  
h1{  
    font-size:36px;  
    font-weight: 600;  
}  
  
p{  
    color:black;  
    font-size:14px;  
    font-weight: 300;  
    line-height:22px;  
    padding:10 px  
}  
  
.row{  
    margin-top:5%;  
    display: flex;  
    justify-content: space-between;  
}
```

```
}

.course-col{

  flex-basis: 31%;

  background: #fff3f3;

  border-radius: 5px;

  margin-bottom: 5%;

  padding: 20px 15px;

  box-sizing: border-box;

}

h3{

  text-align:center;

  font-weight:600;

  margin:10px 0;

}

.course-col:hover{

  box-shadow: 0 0 20px 0px rgba(0,0,0,0.2)

}

@media (max-width:700px) {

  .row{

    flex-direction: column;

  }

}
```

```
}
```

Using The sections we have built we can determine which exact element that we want to modify

for example we are saying everything in the courses section to have

- a width of 80% where as anything with the class rows (which is in the section of courses) to have a margin of 5% and use flexbox to display it, this means that both the section and row css will be applied to row

The @media css element is to optimize mobile display, so what its doing is if the width of the device goes when the browser's width is 700px or less: make the flex direction to column

## Login Page and how the database interacts:

```
<div class='input-fields'>
  <input type='email' name="email" id="email" placeholder='Email' class='input-line full-width'></input>
  <input type='password' name="password" id="password" placeholder='Password' class='input-line full-width'>
  <div><br></div>
  <div><br></div>
```

These are the input fields for the Login page

```
<div><button id="btn" type="submit" class='ghost-round full-width'>LOGIN</button></div>
<form>
```

once the submit button is pressed it will get sent to the PHP page Where a session will start and the login process will begin

```

session_start();
include 'dbh.php';

if (isset($_POST['email']) && isset($_POST['password'])) {
    function validate($data)
    {
        $data = trim($data);
        $data = stripslashes($data);
        $data = htmlspecialchars($data);
        return $data;
    }
    $username = validate($_POST['email']);
    $password = validate($_POST['password']);

    if (empty($username)) {
        header("Location: logInPage.php?error=Email is required");
        exit();
    } else if (empty($password)) {
        header("Location: logInPage.php?error=Password is required");
        exit();
    } else {
        $sql = "SELECT * FROM Students Where email='$username' AND password='$password'";
        $result = mysqli_query($conn, $sql);
    }
}

```

Here we can see that once the login button is pressed it gets sent to this PHP script, this script makes sure everything is set and then runs a validate function which removes white spaces and HTML special characters

if there is something that isn't inputted the header function will set an error message

and then in the Login page

```

<form action="logInPagedb.php" method="post">
    <?php if (isset($_GET['error'])) { ?>
        <p id="formMessage"> <?php echo $_GET['error']; ?> </p> <?php
    }
    ?>

```

It will take this error message and display it to the user within the page itself

```

if (mysqli_num_rows($result) == 1) {
    $row = mysqli_fetch_assoc($result);

    if ($row['email'] == $username && $row['password'] == $password) {

        $_SESSION['email'] = $row['email'];
        $_SESSION['name'] = $row['name'];
        $_SESSION['grade'] = $row['grade'];
        if ($row['grade'] == 1 || $row['grade'] == 7) {
            header("Location: studentPage{$row['grade']}.php");
        } else {
            header("Location:/class-cloud-repo/errorPage/error.php");
        }

        exit();
    } else {
        header("Location: logInPage.php?error=The Username or password is incorrect, Please try again");
        exit();
    }
} else {
    header("Location: logInPage.php");
    exit();
}

```

else if there is a resulting user that matches the username and password and there's only one of them(which there has to be because email is a primary key)

take them to the student page that corresponds with there grade (ex: student first grade then take to student page 1)

we only implemented first and 7th grade that is why the if statements take us to an error page if they aren't in the first or seventh grade.

## Student Signup using AJAX

```
<form id="studentForm"></form>
<div class='input-fields'>
  <input type='text' placeholder='Name' class='input-line full-width' id="name" required></input>
  <input type='email' placeholder='Email' class='input-line full-width' id="email" required></input>
  <input type='password' placeholder='Password' class='input-line full-width' id="OGpassword" required></input>
  <input type='password' placeholder='Repeat Password' class='input-line full-width' id="password" required></input>

<br><br>
<select id="grade" name="grade" class='input-line full-width' required>
<option value="" disabled selected hidden>What Grade Are you in?</option>
<option value="1">1st Grade</option>
<option value="2">2nd Grade</option>
<option value="3">3rd Grade</option>
<option value="4">4th Grade</option>
<option value="5">5th Grade</option>
<option value="6">6th Grade</option>
<option value="7">7th Grade</option>

</select>

<br><br>
<div><button id='button' class='ghost-round full-width'>Create Account</button></div>
<div><button id='button' onclick="window.location.href='logInPage.php';" class='ghost-round full-width'>Login </button>
</div>
</form>
```

Here is the form for the student Page

it allows students to put in their information and then when they press the signup button the button will run postContent() function

```
window.onload = function () {
  document.getElementById('button').addEventListener('click', postContent);
```

here the function will define variables

```
function postContent(e) {

  var name = document.getElementById('name').value;
  var email = document.getElementById('email').value;
  var password = document.getElementById('password').value;
  var ogPassword = document.getElementById('OGpassword').value;
  var select = document.getElementById('grade');
  var grade = Number(select.options[select.selectedIndex].value);
```

```
if (name == "" || email == "" || password == "" || ogPassword == "" || grade == "") {  
    alert("Please Fill All Fields to continue");  
    return false;  
}  
  
else{  
    var emailClear = validateEmail(email);  
    var passClear = validatePassword(password,ogPassword);  
    if(!emailClear||!passClear){  
        return false;  
    }  
    else {  
        //  
    }  
}
```

to validate that these inputs are correct

and then

```

else{
    var emailClear = validateEmail(email);
    var passClear = validatePassword(password,ogPassword);
    if(!emailClear || !passClear){
        return false;
    }

    else {
        e.preventDefault();
        var params = "name="+name+"&email="+email+"&password="+password+"&grade="+grade;
        var xhr=new XMLHttpRequest();

        xhr.open('POST','studentSignup.php', true);
        xhr.setRequestHeader('Content-type','application/x-www-form-urlencoded')

        xhr.onload = function(){
            if (this.status == 200) {
                if (this.responseText == '200') {
                    alert("Congratulations you are now a member of ClassCloud! lets login");
                    window.location.replace('logInPage.php');
                }
                else {
                    console.log("USER CANNOT BE ADDED: "+this.responseText);
                }
            }
        }

        xhr.send(params);
    }
}
}

```

Start with the post-process

To post something to a database using AJAX we need an XHR element that takes in what PHP file we need to use

we send parameters to the XHR function of what we need to be put in the database and send them

and depending on the response we either get an alert of you have been added or we get an error

## StudentSignup PHP

```
<?php
$conn = mysqli_connect('localhost', 'root', 'usbw', 'classclouddb');

if (isset($_POST['password'])) {
    $name = mysqli_real_escape_string($conn, $_POST['name']);
    $email = mysqli_real_escape_string($conn, $_POST['email']);
    $password = mysqli_real_escape_string($conn, $_POST['password']);
    $grade = mysqli_real_escape_string($conn, $_POST['grade']);
    $query = "INSERT INTO Students(name,email,password,grade) VALUES('$name','$email','$password','$grade')";
}

if (mysqli_query($conn, $query)) {
    echo "added";
} else {
    echo 'ERROR ' . mysqli_error($conn);
}
```

The PHP that the XHR parameters have been sent to simply takes in all the parameters and then makes sure to use a real escape string for safety purposes to prevent SQL injections

then uses the INSERT INTO query to put this data in the database

## Our Student Table in the database:

---



Welcome to phpMyAdmin

! No activity within 1440 seconds; please log in again

Language

English

**Log in** ?

Username:

Password:

The screenshot shows the phpMyAdmin login interface. At the top, there is a logo of a sailboat and the text "phpMyAdmin". Below that is a welcome message "Welcome to phpMyAdmin". A red box at the top indicates "No activity within 1440 seconds; please log in again". There is a "Language" dropdown menu set to "English". The main login form has "Log in" button, "Username" field containing "root", and a "Password" field.

Here we see we need a username and password to access our database making it a more secure Database Management System

Showing rows 0 - 27 (28 total, Query took 0.0005 sec) [email: AAA@AAA.COM - SSADSDS@AAA.COM]

**SELECT \***  
**FROM `students`**  
**LIMIT 0 , 30**

Show : Start row: 0 Number of rows: 30 Headers every 100 rows

Sort by key: None

	name	email	password	grade	Type	
<input type="checkbox"/>	>Edit Copy Delete	Ameer Jamal	aaa@aaa.com	Abc123	1	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	abdullah	abd@gmail.com	Abc123	1	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	asd	afdsfsd@asd.asd	Asd123	3	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	ahmad dalala	ah@gmail.com	Abc123	7	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	ahmad	ahmad@gmail.com	Abc1234	1	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	Ameer Mamoun Jamal	ame20180381@std.psut.edu.jo	Psut@1234	1	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	fsdfsfdsd	Ameer101943@gmail.com	Asdfg123	1	s
<input type="checkbox"/>	<input type="checkbox"/> Edit Copy Delete	Ameer Jamal	Ameer101944@gmail.com	Abc123	1	s

in our database, we can see that the student signup page adds data correctly and the columns match what has been inputted

notice the Type column which is set to s as default

the reason for this is so when the student comes to log in the login PHP code knows that they are a student and takes them to the correct page accordingly

student Pages :

```

<?php

include_once 'sidebar.php'

?>

<div class="container">

<?php include_once 'header.php' ?>

```

For reusability we are using the php function include once, which takes in all the markup and style and functionality from things like the sidebar and header and uses it consistently whenever we need it like in the student pages, so this way we can only change what matters to us which is the content

```
<div class="imgWrapper">
  window.open("math<?php echo $_SESSION['grade'] ?>.php","_self")>Solve some Math<
</div>
```

in this student page content we can see that we are using a grid system of images and when we click on them it takes us to the subject followed by the number of the subject (this depends on the grade)

example first grade math should go to the math1 page

## The sidebar and its challenges

When making the sidebar we faced some difficulty with the styling and with the question of "How do we get the sidebar to display the correct information depending on the user, without having to repeat code to maintain its modularity?"

The solution lies in PHP:

```
<?php
session_start();
if (isset($_SESSION['email']) && isset($_SESSION['name'])) {
?>

<div class="sidebar">
  <div class="logoContent">
    <div class="logo">
      <i class="fa fa-creative-commons"></i>
```

With PHP we can say conclusively that if the login was successful then a session was set then what that means is we can display the sidebar

```


<div class="nameJob">
    <p class="name" style="font-weight:bold; font-size: 22px;"><?php echo $_SESSION['name'] ?><br>
    <p style="font-size: 15px;font-weight:lighter;"> A Proud Scholar</p>
</p>

```

and in this sidebar, we can do something like this where we echo data into where we require.

```

<div class="home">

    <?php

} else {

    echo "<script>
        window.location = '/class-cloud-repo/errorPage/error.php'
    </script>";
}

```

else if it is not set we can send the user to an error page.

## Subjects and how the video and quiz system work:

```

<div class="contentRow">
    <div class="youtube">
        <object data="img/left_arrow.svg" width="70" height="200">dd </object>
        <iframe id="youtubeFrame" width="720" height="400" src="https://www.youtube.com/embed/igcoDFokKzU" title="Quiz Test">
        <object data="img/right_arrow.svg" width="70" height="200"> </object>
    </div>

    <h3>Want to Test what you've learned?</h3>
    <!--<iframe id="formFrame" src="https://docs.google.com/forms/d/e/1FAIpQLSfM0CuR1D1XLLc4xKYLHf6EqGOYhjyE7A
    <iframe src="/class-cloud-repo/quizes/quiz.html" width="720px" height="400px" frameborder="0"></iframe>
-->
</div>
</div>

```

in the beginning test the idea was to make our own videos but due to the time constraints, we decided to take advantage of the HTML Iframe feature, with this we can source a video from youtube and then display it for an easy click and play for students to watch and learn.

we also decided to use an Iframe for the quiz elements of the subject too, as we've built an entire mini web application to support quizzes then put that into the subject page to display.

## The quizzes

```
; > JS game.js > [e] questions
let score = 0;
let questionsCounter = 0;
let availableQuestions = {}
let questions = [
  {
    questions: "what is 2 + 2",
    choice1: '2',
    choice2: '4',
    choice3: '5',
    choice4: '3',
    answer:2,
  },
  {
    questions: "what is 12 - 4",
    choice1: '2',
    choice2: '8',
    choice3: '5',
    choice4: '3',
    answer:2,
  },
  {
    questions: "what is 10 + 6",
    choice1: '16',
    choice2: '33',
    choice3: '22',
    choice4: '10',
    answer:1,
  }
]
```

we built the quiz using mainly JS and CSS to make it closer to a game for kids.

```

getNewQuestion = () => {
  if (availableQuestions.length === 0 || questionsCounter > MAX_QUESTIONS) {
    localStorage.setItem('mostRecentScore', score);

    return window.location.assign('/class-cloud-repo/quizes/end.html');
  }

  questionsCounter++;
  progressText.innerText = `Question ${questionsCounter} of ${MAX_QUESTIONS}`;
  progressbarFull.style.width = `${(questionsCounter / MAX_QUESTIONS) * 100}%`;

  const questionsIndex: number
  const questionsIndex = Math.floor(Math.random() * availableQuestions.length);
  currentQuestion = availableQuestions[questionsIndex];
  Question.innerText = currentQuestion.questions;
  Choices.forEach(choice => {
    const number = choice.dataset['number'];
    choice.innerText = currentQuestion['choice' + number]
  })
}

```

here is the function we use to cycle through new questions, simply put

this goes through the array of questions, and cycles between them

for each question the progress bar gets filled with a certain calculated percentage

the questions are randomized each time by taking the index and multiplying it by a random constant

when the question set is over we take the user to the end quiz page

```

Choices.forEach(choice => {
  choice.addEventListener('click', e => {
    if (!acceptingAnswers) return;

    acceptingAnswers = false;
    const selectedChoice = e.target;
    const selectedAnswer = selectedChoice.dataset['number'];

    let classToApply = selectedAnswer == currentQuestion.answer ? 'correct' : 'incorrect';

    if (classToApply == 'correct') {
      incrementScore(SCORE_POINTS);
    }

    //selectedChoice.parentElement.classList.add(classToApply);

    if(classToApply == 'incorrect')
      selectedChoice.parentElement.style.background = "red";
    else
      selectedChoice.parentElement.style.background = "green";

    setTimeout(() => {
      selectedChoice.parentElement.style.backgroundColor = 'rgb(' + 18 + ',' + 93 + ',' + 255 + ')';
      getNewQuestion()
    },1000
  )
}

```

This function updates the score when a student clicks on a certain choice depending on the answer if it is correct or not it will add color to it, and then show it to the student for 1000ms

then revert back all the choices to the original color and make run the getNewQuestion() function

# **Chapter 7: System Test Document**

# **Testing Introduction:**

## **1.1 System Overview**

The system is split up into students, and parents, and on the main page for each component of the system we are going to be testing the necessary functionality for the system

## **2.1 Features to be Tested**

The Following Features is a list of features to be focused on during testing phase.

ClassCloud Student:

Ability to signup

Ability to log in

The password restrictions

the email restrictions

the ability to change the password

the ability to watch videos

the ability to select topics

the database retrieving correct information for students

the student going to the correct page when logging in

the quiz saving past scores

the video loading

ClassCloud Parents:

Ability to signup

Ability to log in  
The password restrictions  
the email restrictions  
the ability to change the password  
the connection of database matching the student to the parent  
displaying information of the student  
giving the parent the ability to change password

## **2.2 Features not to be Tested**

The Server speed as its a local host server and that depends highly on the hardware  
A deeper level of security and hacker deterrent tests as of time constraints  
The availability of the website as it's on a local host and as long as the machine is running the server should be running

## **2.3 Testing Tools and Environment**

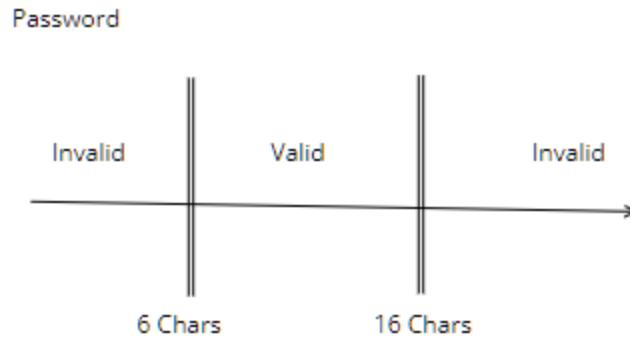
The testing will be done by both of us, as the developers of the project  
we will be doing unit tests for each part of our code/functions and also black-box testing as we use the website to check if everything meets requirements, the testing duration will be throughout the whole implementation phase and then be given an extra two days to make sure it all integrates well together.

The validation checks will be done using regular expressions whenever possible due to its powerful nature in matching cases

we will also be using python for automated testing using selenium to run signups and logins

### **3. Test Cases**

Password input test:



we can see that we want to make sure that the password is more than 6 and less than 16 characters long

we also need to make sure that:

the password contains lowercase and capital letters the password must also contain a number

```
function validatePassword(pass1, pass2) {  
    var minNumberofChars = 6;  
    var maxNumberofChars = 16;  
    var regularExpression = /^(?=.*?[A-Z])(?=.*?[a-z])(?=.*?[0-9]).{6,}$/;  
    var clear = true;  
  
    if (pass1 != pass2) {  
        alert("passwords do not match")  
        clear = false;  
    }  
  
    else if (pass1.length < minNumberofChars || pass1.length >  
maxNumberofChars) {
```

```
        alert("password must be a minimum of 6 characters and a max of 16
")
        clear = false;
    }

    else if (!regularExpression.test(pass1)) {
        alert("password should contain at least one number and one Capital
letter");
        clear = false;
    }

    return clear;
}
```

the validation functions will return clear, if clear is false then that means the password is not valid else it is

password must be a minimum of 6 characters and a max of 16

OK

Hello There Students!

Welcome to ClassCloud please make an account to continue

Ameer

Ameer10@gmail.com

1st Grade

▼

localhost:8080 says

password should contain at least one number and one Capital letter

OK

Hello There Students!

Welcome to ClassCloud please make an account to continue

Ameer

Ameer10@gmail.com

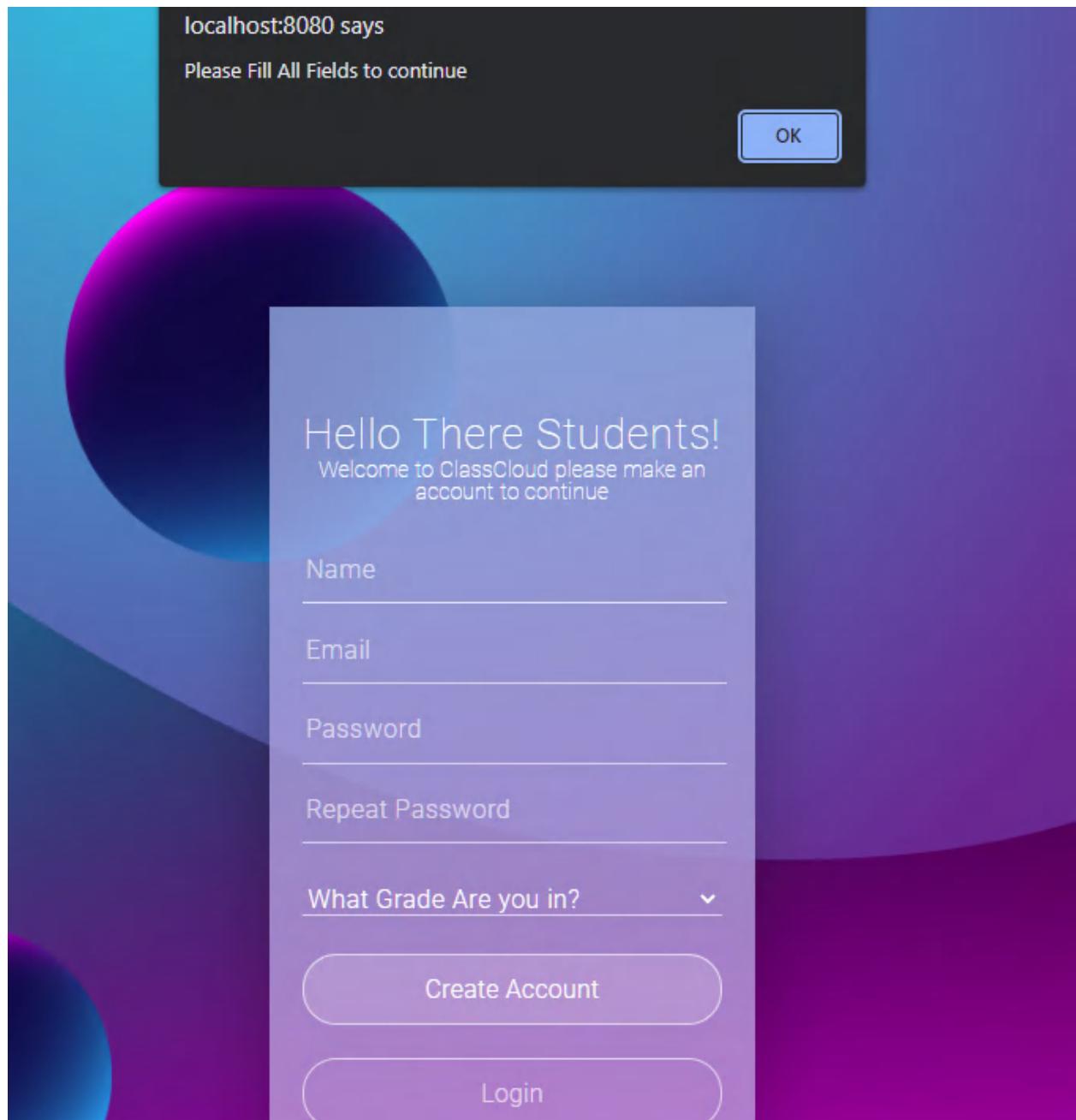
\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*

1st Grade

Create Account



For the email we must make sure it is in the form of

xxxx@xxx.xxx (after the @ it needs to be 2 or 3 chars long)

where x is an characters

```
function validateEmail(email) {  
    var clear = true  
    var mailformat = /^[^\w+(\[\.\-]\?\w+)*@\w+(\[\.\-]\?\w+)*(\.\w{2,3})+$/;  
  
    if (email.match(mailformat)) {  
        return clear;  
    }  
  
    else {  
        alert("You have entered an invalid email address!");  
        clear = false  
        return clear;  
    }  
}
```

You have entered an invalid email address!

OK

Hello There Students!

Welcome to ClassCloud please make an account to continue

Ameer

aaa

.....

.....

1st Grade

▼

## Login Verification:

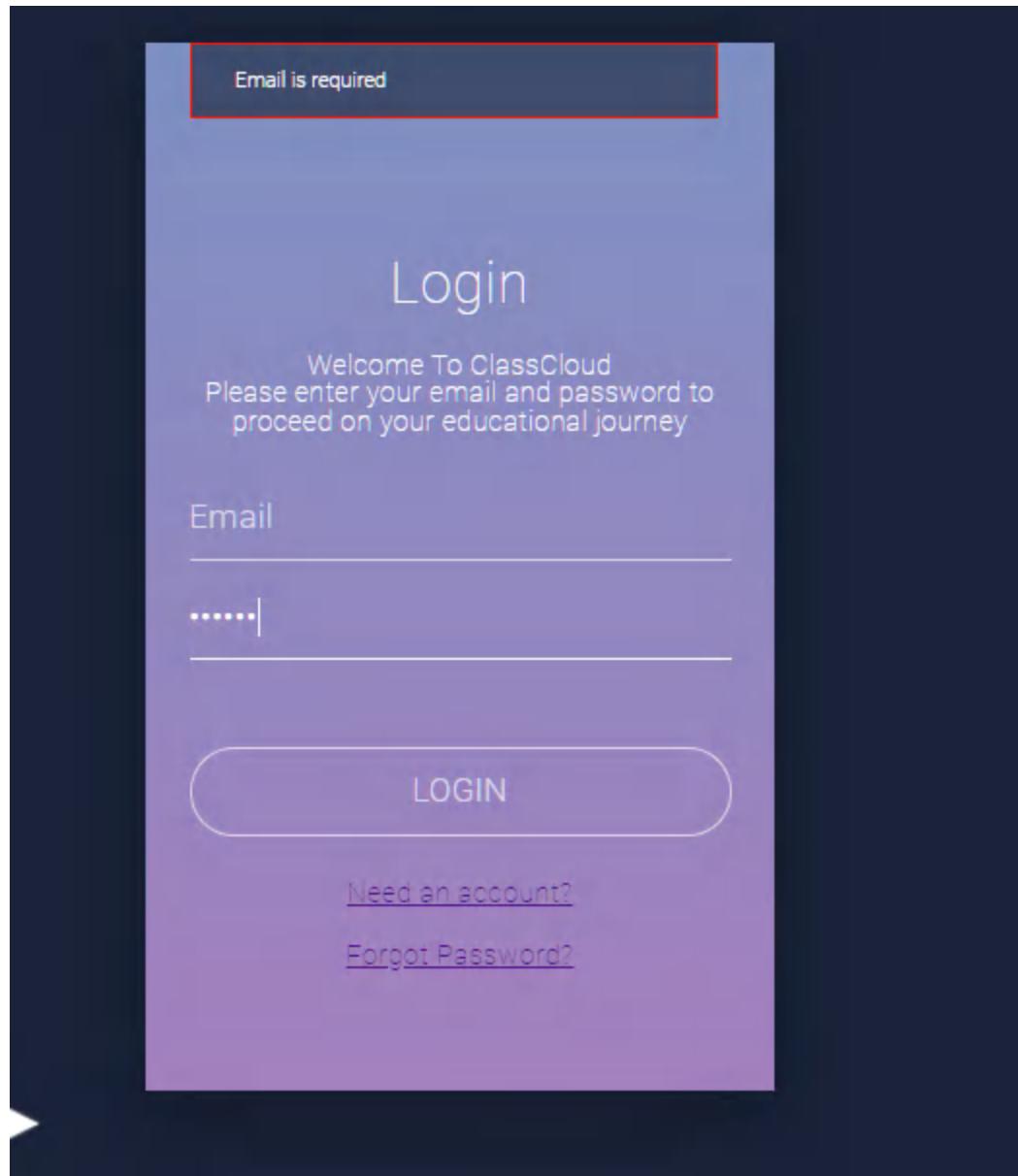
```
if (isset($_POST['email']) && isset($_POST['password'])) {
    function validate($data)
    {
        $data = trim($data);
        $data = stripslashes($data);
        $data = htmlspecialchars($data);
        return $data;
    }
    $username = validate($_POST['email']);
    $password = validate($_POST['password']);

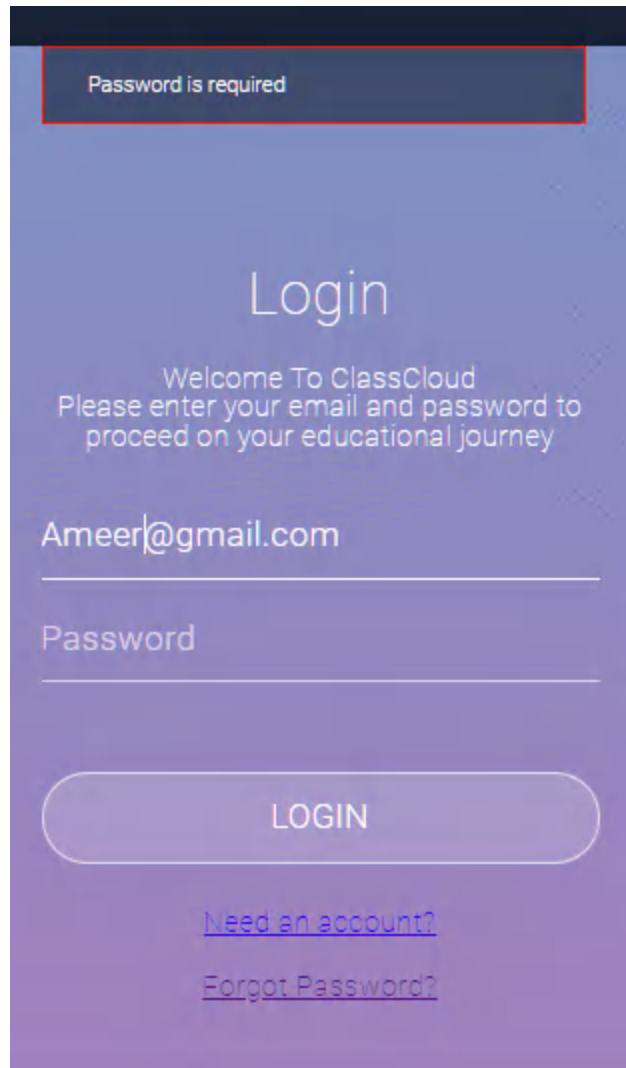
    if (empty($username)) {
        header("Location: logInPage.php?error=Email is required");
        exit();
    } else if (empty($password)) {
        header("Location: logInPage.php?error=Password is required");
        exit();
    } else {
        $sql = "SELECT * FROM Students Where email='$username' AND password='$password'";
        $result = mysqli_query($conn, $sql);
```

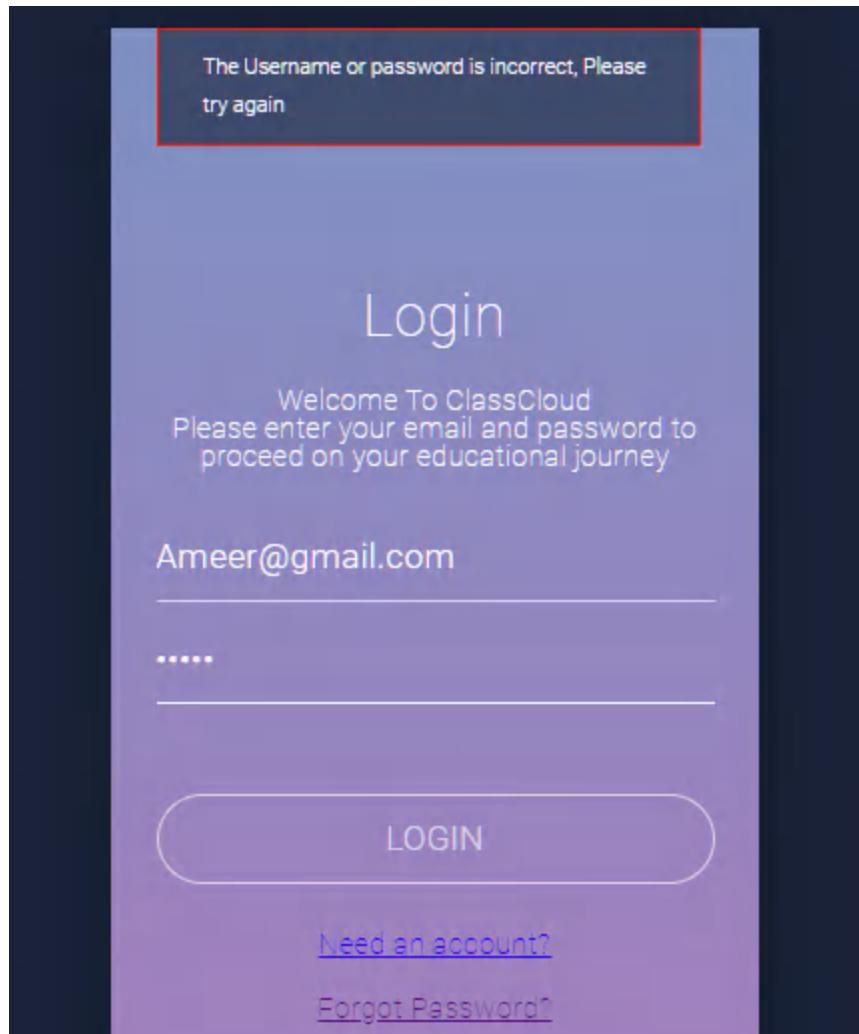
In the login page, we are mainly checking three things

- if the password is empty
- if the username is empty
- if the password and username match, or not

As we see if there is an error the message will be sent to the header and that can be taken to show an error message that we will demonstrate below.







## Quiz Testing

The main part of testing the quiz is making sure the quiz is able to store the high scores properly and make sure that the score updates according to how you answered the question and switch between the question, also we need to make sure that you can retake the quiz.

Question 1 of 4

Score

0

what is  $10 + 6$

A 16

B 33

C 22

D 18

Here is a wrong answer with the score not increasing

Question 2 of 4

Score

100

what is  $2 + 2$

A 2

B 4

Here is a right answer with the score increasing

# LeaderBoard

Here are your past scores

- 300
- 300
- 100

Back

Clear Scores

and here we can see the answers being properly saved

```

let questions = [
  {
    questions: "what is 2 + 2",
    choice1: '2',
    choice2: '4',
    choice3: '5',
    choice4: '3',
    answer: 2,
  },
  {
    questions: "what is 12 - 4".
  }
]

```

```

Choices.forEach(choice => {
  choice.addEventListener('click', e => {
    if (!acceptingAnswers) return;

    acceptingAnswers = false;
    const selectedChoice = e.target;
    const selectedAnswer = selectedChoice.dataset['number'];

    let classToApply = selectedAnswer == currentQuestion.answer ? 'correct' : 'incorrect';

    if (classToApply == 'correct') {
      incrementScore(SCORE_POINTS);
    }
  })
}

```

Here we can see some whitebox testing being used (more about this below) where we are cycling through all the answers which are in the array connected to the questions and then if what we selected = the correct answer increment score and change color.

## **the Testing Methodologies used to get the above results**

### **Black-box Testing:**

is a method of software testing that examines the functionality of an application without knowing its internal structures or workings. This method of test can be applied virtually to every level of software testing so its a suitable and efficient way of testing, this was our main method of testing

for blackbox testing we went through the pages one by one making sure the high level functionality is available and working properly, the functionality has to be in cohesion with the system requirements stated.

like for example in the quiz where we played the game and made sure our score was working properly and being saved, while also making sure the question randomization was working as expected and the color-changing that happens when a choice is selected does what it needs to do for right and wrong choices.

### **Data Testing:**

For this technique, we will be using 3 methods which are boundary testing,

null testing, and bad data testing. as we saw above for both the login and signup we made sure that Null data isn't accepted

and that bad data is rejected (no username and password match on the login page for example) and that the boundaries are properly matching with the password or email signup (password must be more than 6 characters and less than 16 characters with a capital/lower case letters and a number )

Data Pass fail criteria:

Passwords:

- Abc123 pass
- Abcdef fail
- 123456 fail
- AAA234 fail

emails: need to have an @ symbol between two words, then a dot symbol that takes in a 2-3 letter word at the end

- [Ameer@gmail.com](mailto:Ameer@gmail.com) pass
- am@d.d fail
- amgmail.com fail
- Ame@gmail.comm fail
- [ame@gmail.ed](mailto:ame@gmail.ed) pass

grade: needs to be from the drop-down list so it can't be failed.

## Alpha and WhiteBox testing:

For Alpha testing, we can see that each bit of code was tested and made sure to run properly by the developers. using regular expression matching made this much easier as once you have your regex pattern you are able to match the required data with it to get a boolean true or false (pass or fail)

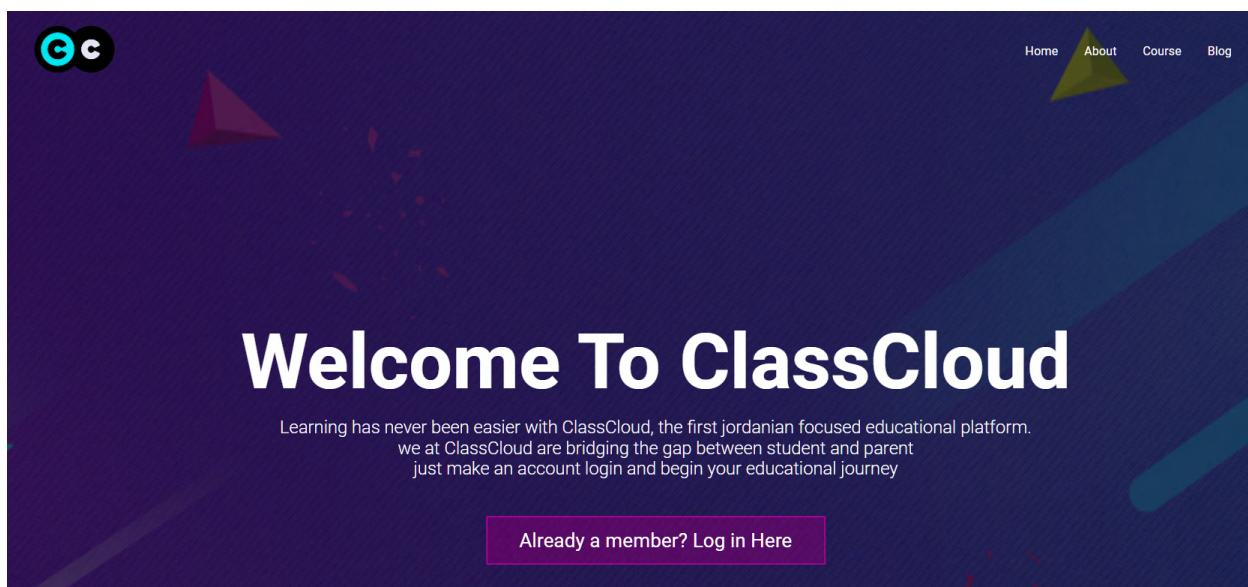
this means the data can easily get verified and validated with javascript before getting into the database and causing problems on the server side

## Beta Testing

Where we let close friends and family try out the website and use the demo we have built to tell us if there was something wrong or to spot bugs in the code or things that could be done better, this proved to open an eye for details we couldn't think through like why not make selecting between a signup type a simple popup rather than taking you to a whole separate page

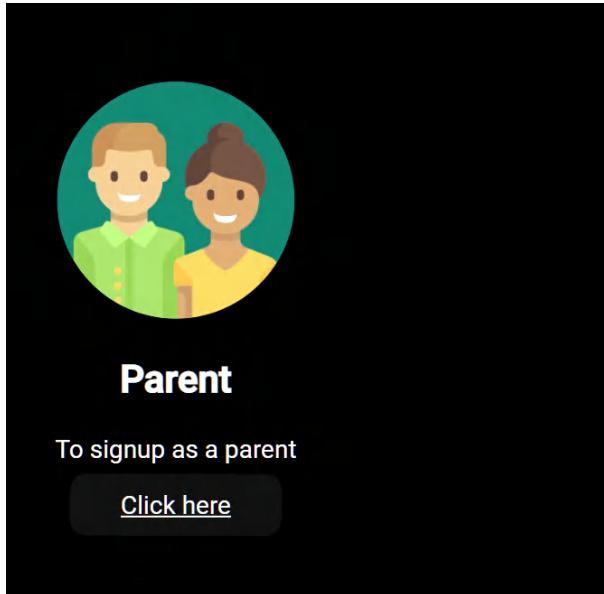
and how the login button for the website should be at the beginning of the page clearly seen instead of somewhere in the middle of the homescreen

this type of testing greatly benefits user satisfaction and usability

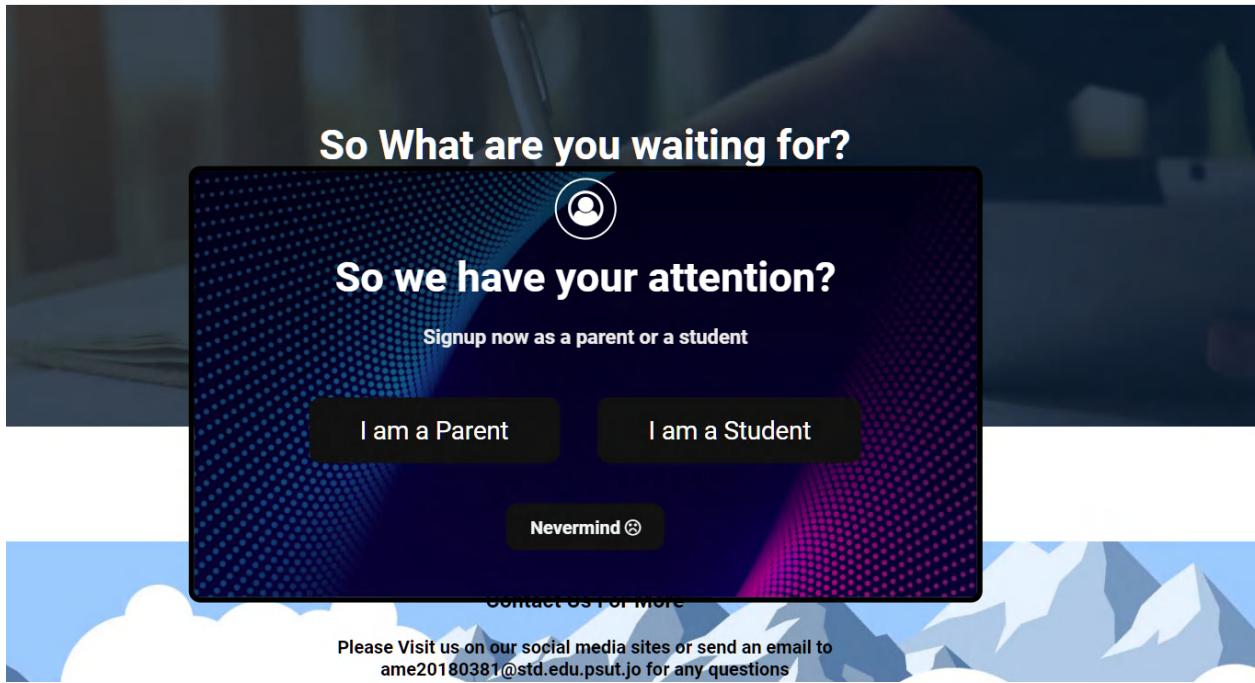


the login button was placed lower in the webpage before beta testing

also selecting to sign up as a parent or student used to look like this before beta testing



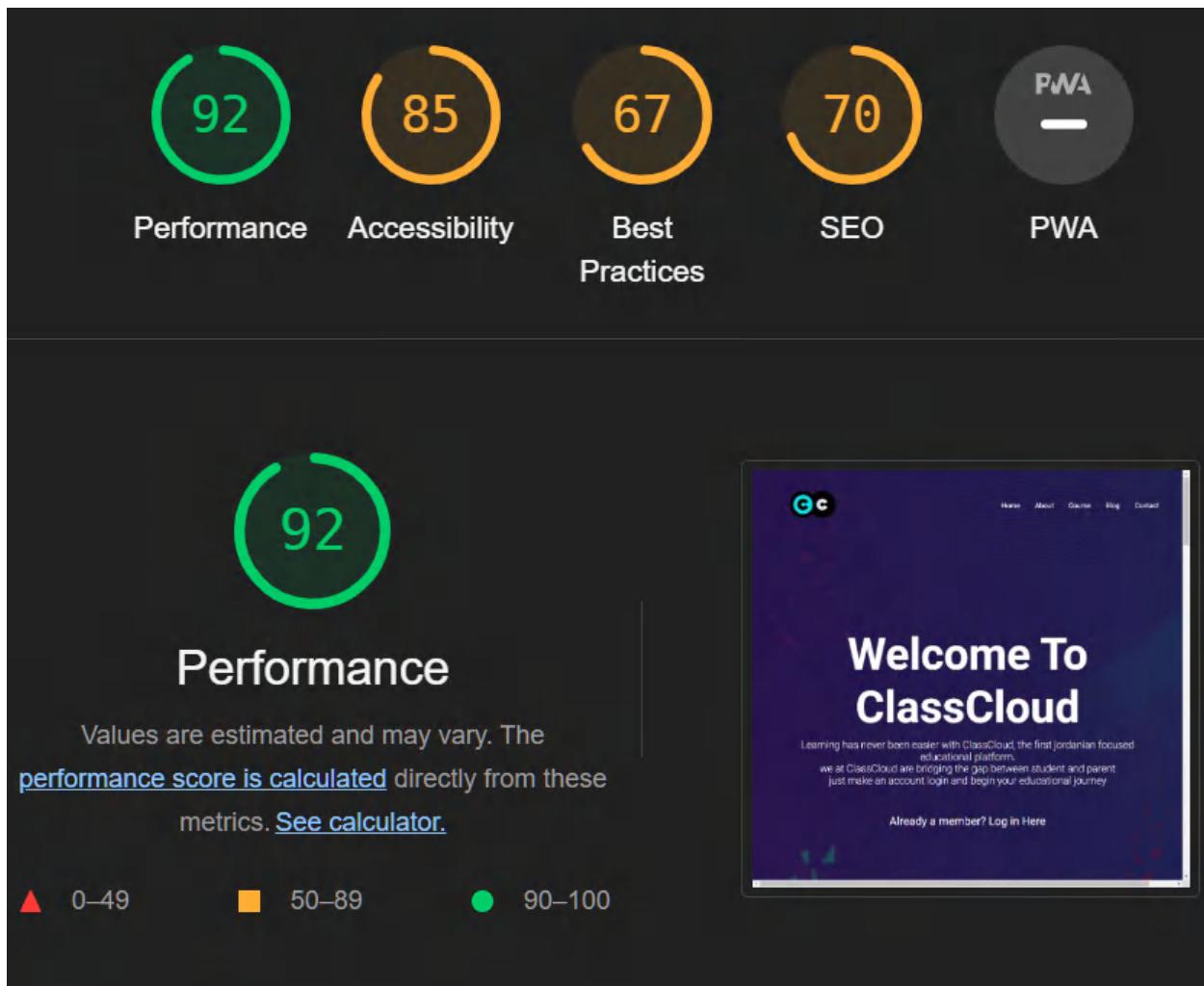
but instead, we enhanced it to be an in-page popup after beta testing

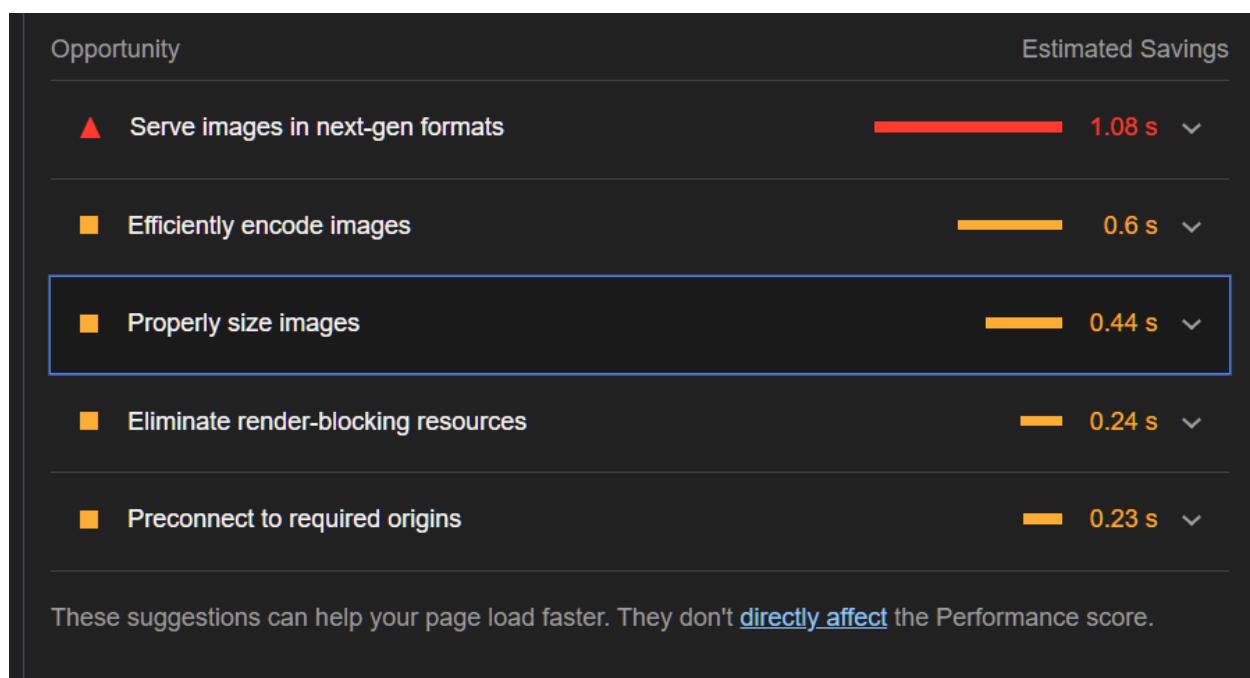
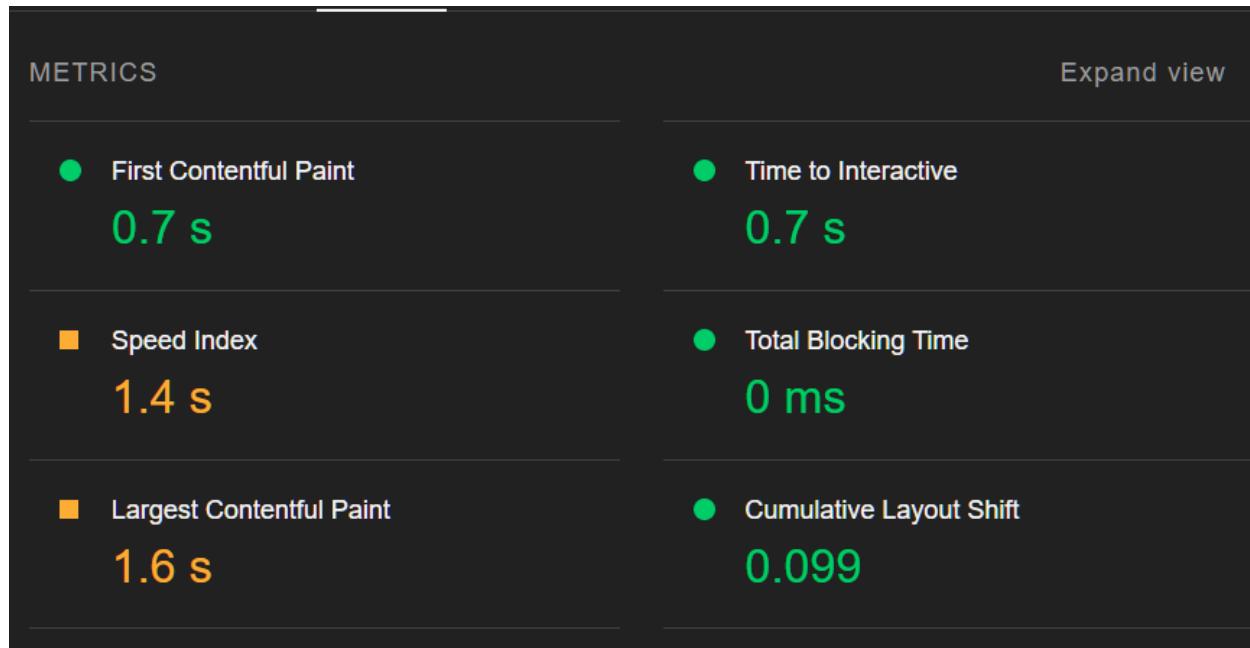


Making for an easier and more user-friendly approach to signing up

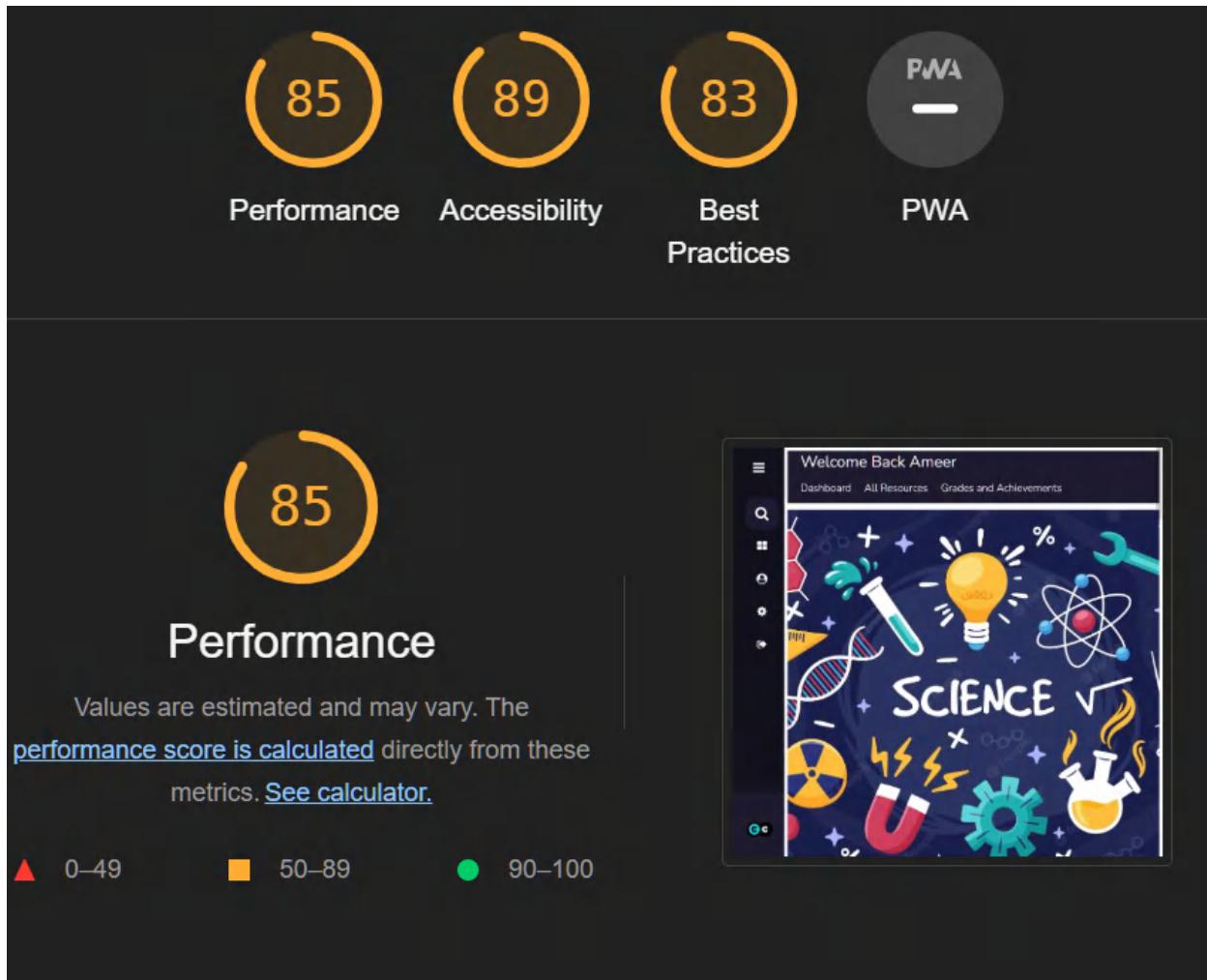
## LightHouse By Google testing

lighthouse is an open-source tool that Google uses to help you improve the quality of web pages. You can run Lighthouse on any page you desire. which proved as a great tool for automated testing of page performance.





Here we can tell where our website excels and where our website can be improved, this lighthouse test was run for our home page



Here is another lighthouse test for our student page 50-89 is medium performance meaning we have some areas to improve with this webpage.

And that is the main reason for lighthouse use, for the automated software to shine some light on where you can improve.

## Python and Selenium Data Entry and boundary automated Testing:

With Python and selenium we built an automated testing tool that allows us to test username and password combinations for the login page, it takes data from a file so you can potentially go through thousands of data sets and even test server load.

```
import time
from selenium import webdriver
```

```

from webdriver_manager.chrome import ChromeDriverManager
import os

def isBrowserAlive():
    try:
        driver.current_url
        # or driver.title
        return True
    except:
        return False

def openUniFile():
    # os.startfile simply opens a file
    os.startfile("C:\\\\Users\\\\Main\\\\Desktop\\\\University")

def makeFile():
    try:    # make a file if not available
        f = open("userTestData.txt", "x")
        makeUsername = input("Enter your username: ")
        makePassword = input("Enter your password: ")
        # f = open("userData.txt", "a")
        f.write(makeUsername + "\\n" + makePassword)
        f.close()
        print("file was made successfully")
    except:
        # if file already created return as this function is only

```

```

# responsible for making a file if not available

return

def readfile():

    try:

        # delegating responsibility and making sure file is made

        makefile()

        f = open("userTestData.txt", "r")

        # Using readlines() to read each line in the file

        # and save it to the data list

        Lines = f.readlines()

        # Strips the newline character and makes

        # sure its clean text

        data = []

        for line in Lines:

            data.append(line.strip())

        f.close()

        print("file was read successfully")

        return data

    except:

        # if an error has occurred then reset the file

        print("error file reading encountered an issue a problem ")

        print("please try resetting the file")

        resetfile()

```

```

def resetFile():

    char = input("please type R to reset the username and password or 'x'
to go back: ")

    if char == "r" or char == "R":

        os.remove("userTestData.txt")

        makeFile()

    elif char == 'x':

        return

    else:

        print("wrong character")

        resetFile()

def classCloudLogin(userName, passWord):

    try:

        # set URL

        url = "http://localhost:8080/class-cloud-repo/logInPage.php"

        # We are using global to make sure browser doesnt close

        global driver

        # gets the latest chrome driver

        driver = webdriver.Chrome(ChromeDriverManager().install())

        driver.maximize_window()

        driver.get(url)

        # entering key presses for username and password

        # and clicks on login and elearning button

```

```

        driver.find_element_by_id("email").send_keys(userName)

        driver.find_element_by_id("password").send_keys(passWord)

        driver.find_element_by_id("btn").click()

    except:

        # if error occurs in username and password then quit browser reset
        file and try again

        quitDriver()

        print("an error has occurred please try and reset your username
and password")

        resetFile()

        classCloudLogin(readFile()[0], readFile()[1])



def quitDriver():

    driver.quit()



def reRunlogin():

    quitDriver()

    username = readFile()[0]

    password = readFile()[1]

    classCloudLogin(username, password)





print("\n\n===== Welcome to our testing Auto Login solution =====\n\n")

# start with making a file for first time use or if file gets deleted

makeFile()

```

```

# setting the username to the first line in the text file userTestData.txt
# and the password to the second line

# NOTE if the file contains other lines it will ALWAYS TAKE the first two

username = readFile()[0]

password = readFile()[1]

# calls the login function which opens the browser

# and auto logins depends on the data

classCloudLogin(username, password)

# ask user at the end if they would want to reset username and password or
exit browser

# if the input is not x it will allow you to reset information and if
wanted rerun browser

# else it will break the loop and exit and close driver

choice = "null"

while isBrowserAlive():

    print("\n\n if you would like to reset login information type 'yes'
\nTo exit browser please type 'x' ")

    choice = input()

    if choice == "yes" or choice == "Yes" or choice == "YES" or choice ==
'y' or choice == 'Y':

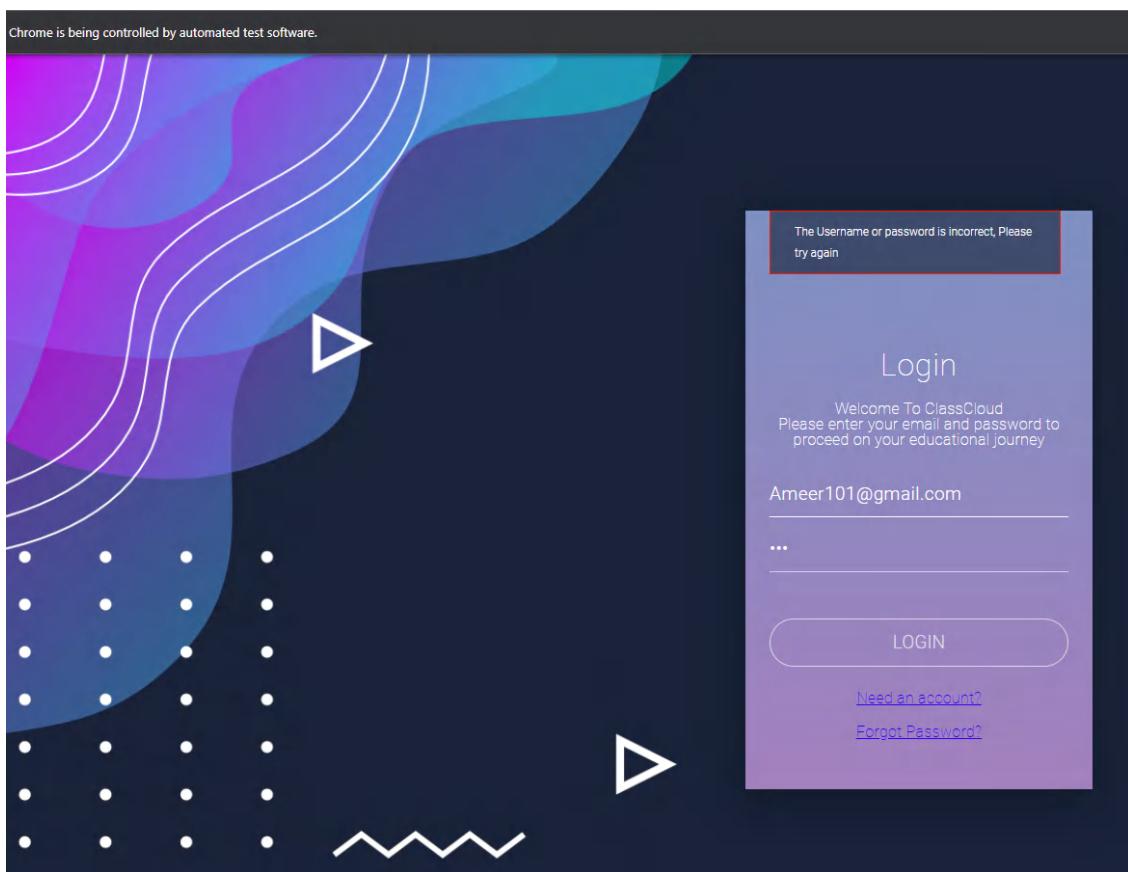
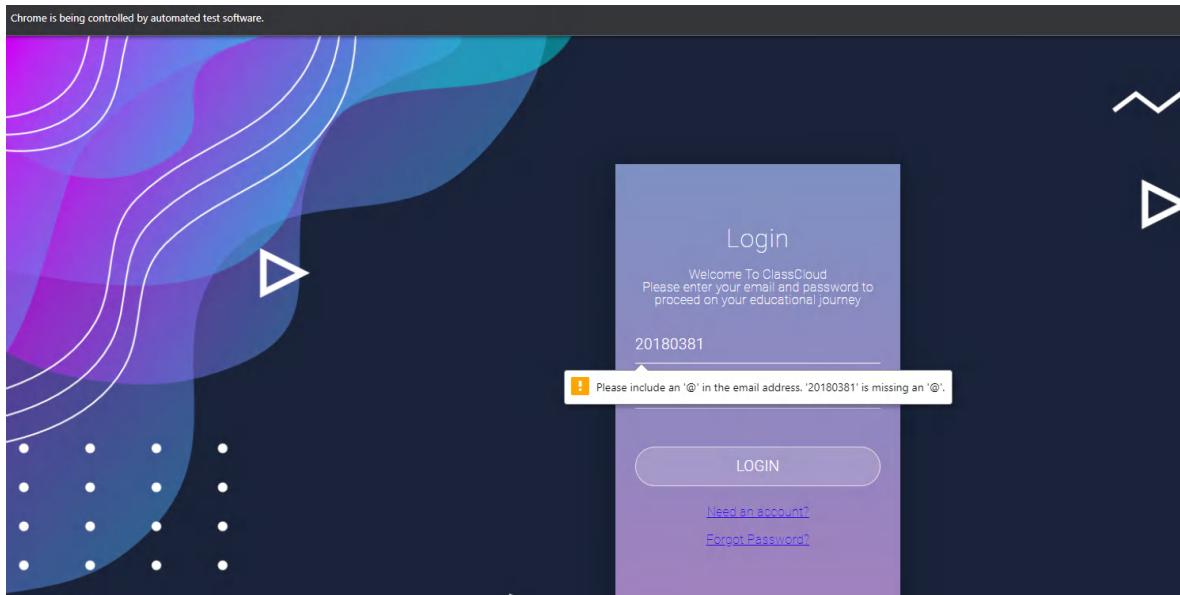
        resetFile()

```

```
choice = input("if you would like to rerun browser type 'yes' if  
not type 'no : ")  
  
if choice == "yes" or choice == "Yes" or choice == "YES" or choice  
== 'y' or choice == 'Y':  
  
    reRunlogin()  
  
if choice == 'no':  
  
    continue  
  
elif choice == 'x' or choice == 'X' or choice == "exit" or choice ==  
'EXIT' or choice == 'Exit':  
  
    break  
  
  
quitDriver()
```

This program in layman's terms opens a file, reads its data and then opens ClassCloud login which python then feeds the data to and gets a result back while also giving us the ability to change the file or reset and has been in itself unit tested . the code is also commented on for further understanding.

## Results of this software running:



This automated testing speeds up the process of testing forms and can be easily applied to signup pages or any other pages that need to be tested

## **Environmental Needs and testing environment**

The following list will be needed in order to support the testing phase and to make it run smoothly:

1) Laptops that support Windows operating system, since the servers work best on windows, and considering this website is built using the WAMP stack

2) Laptops or PC's that has the minimal requirements such as free

20MB storage space for all the files we need to run the website locally, 500MB RAM with an i5 CPU or better in order to run the all the necessary server and backend software and operate well

normally on them.

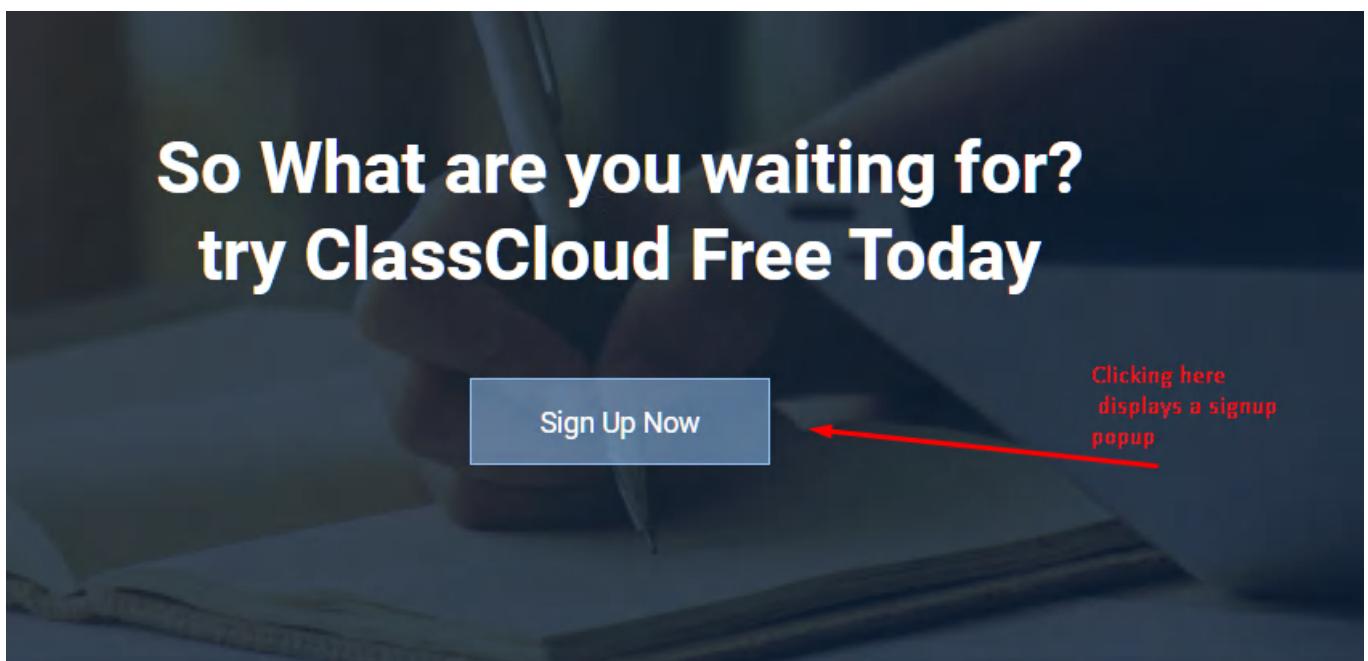
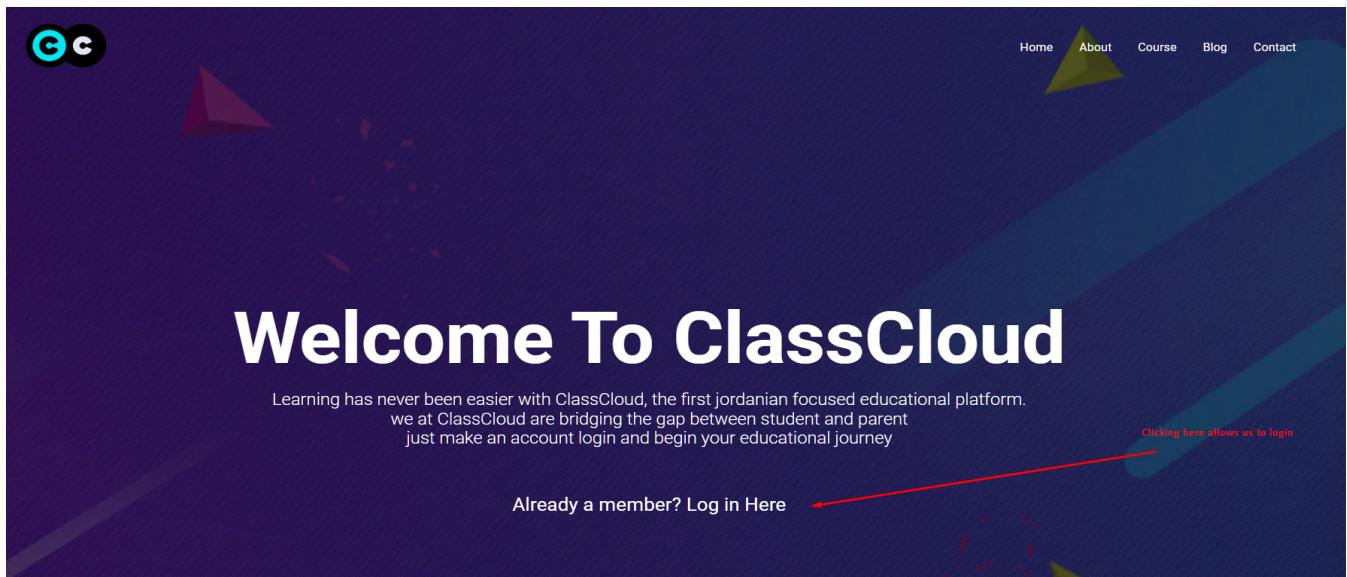
3) Minimum speed internet connectivity to run videos and make sure the server runs properly.

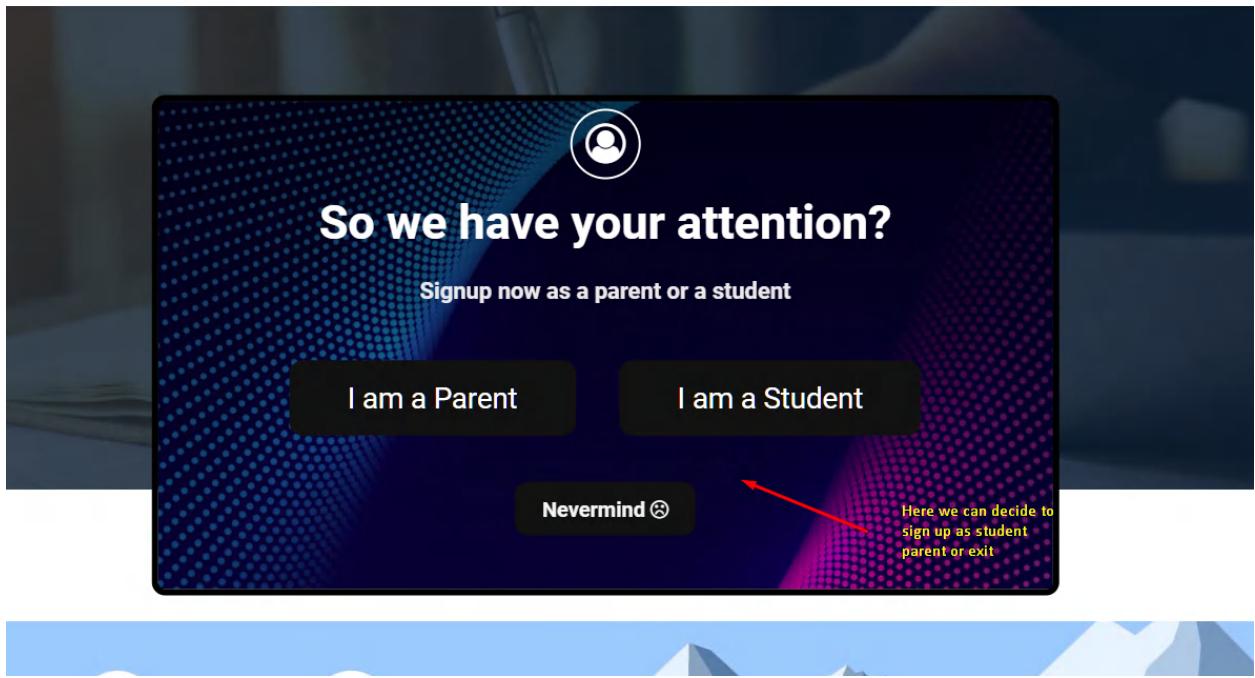
4) Python(with pip install of selenium and chrome web browser), Usbwebserver (with apache and MySQL) Chrome, and all other necessary hardware installed and ready to use

## **Chapter 8: Software User Documentation and Manual**

## Introduction to manual

In this chapter, we will try to document the software for the user (or different types of users) by creating a quick start guide. with screenshots of the pages to help explain how to operate the website





Hello There  
Students!

Welcome to ClassCloud please make an account to continue

Name

Email

Password

Repeat Password

What Grade Are you in?

Create Account

Login

Name to be displayed in for the user

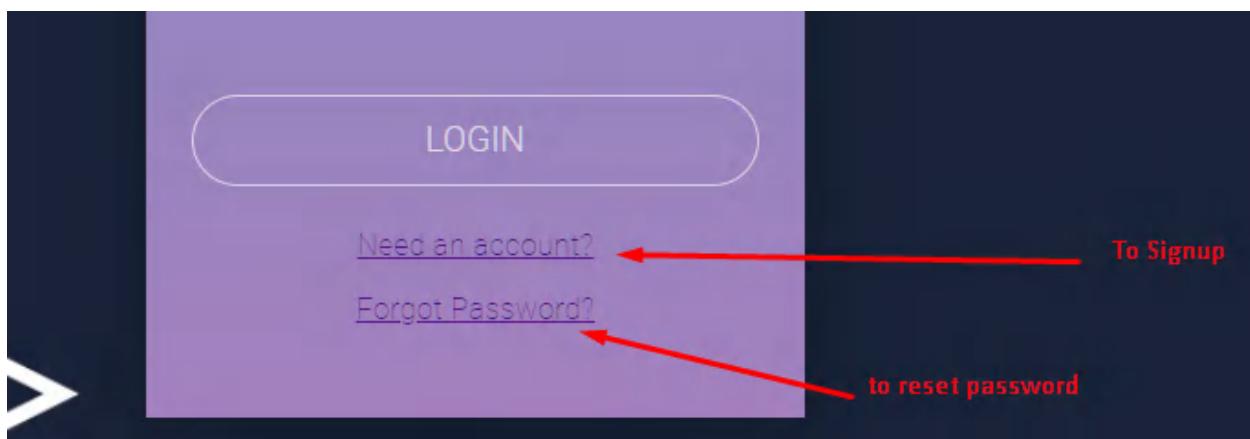
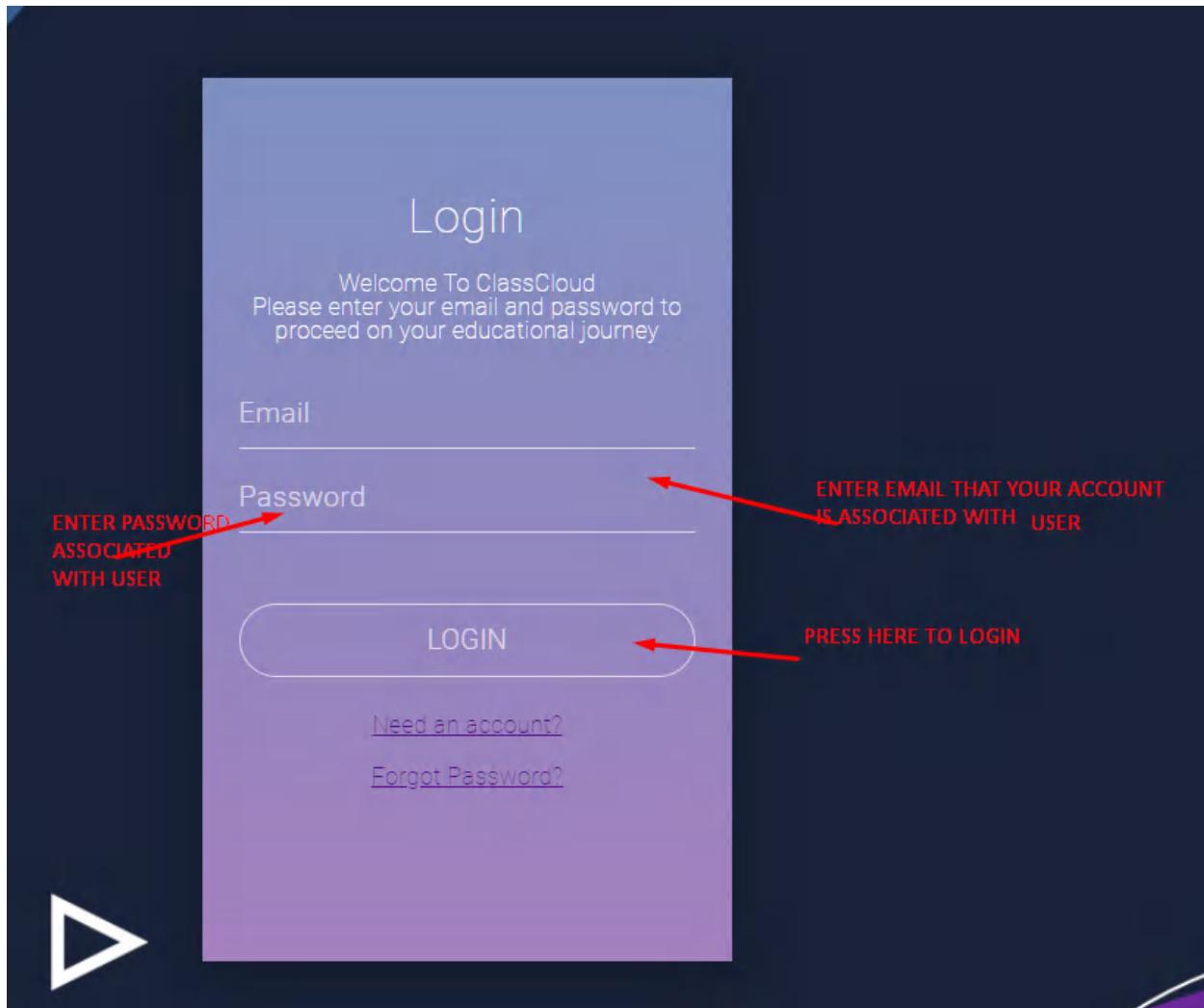
Email of user must be valid in form of  
xxx@xx.xx

Passwords must match  
and must be 6-16 chars with numbers letters  
and a capital letter

Creates account

As of now only grade 1 and 7 works

Takes to the login page



Welcome Back Ameer

Open sidebar

Dashboard All Resources Grades and Achievements

Go to dashboard See resources See Grades

SCIENCE

MATH

$[a + b]$

$A = \frac{ab + c}{d}$

$\pi = 3.14$

$y$

$z$

$f(a + b) = c$

$(x + y)^2 - (x - y)$

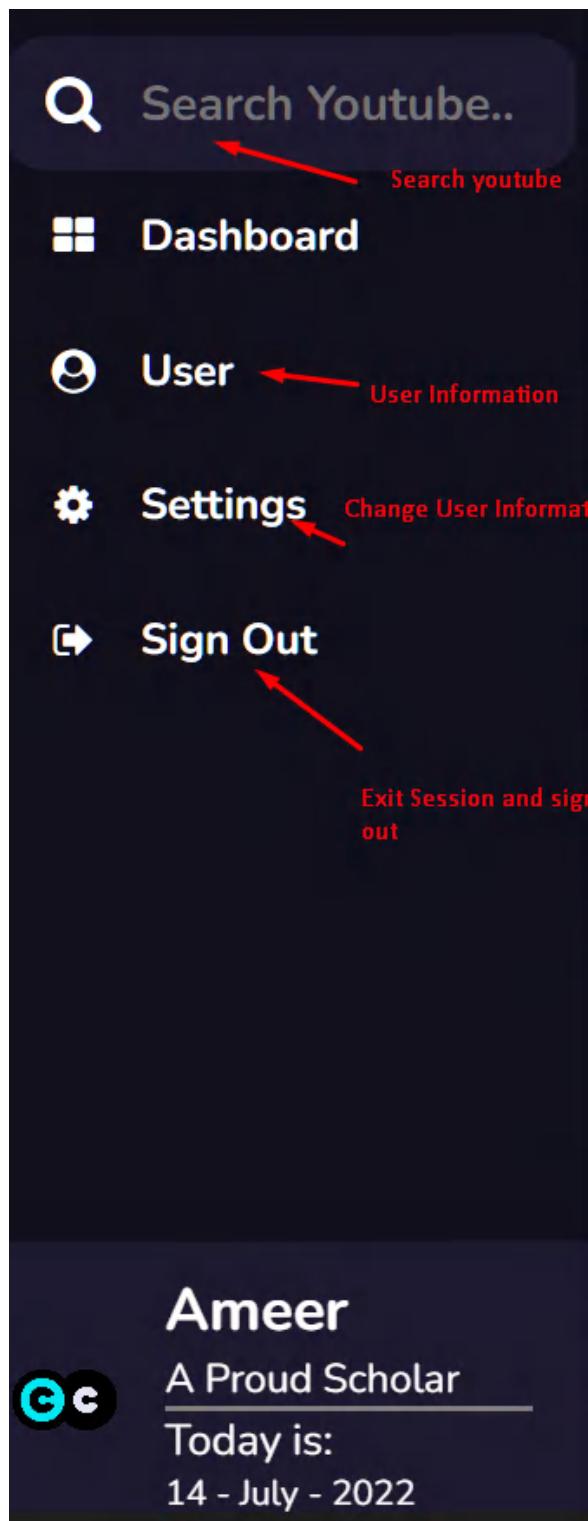
$+ 2c = 1$

$+ 5z = 38$

$\pi$

$b$

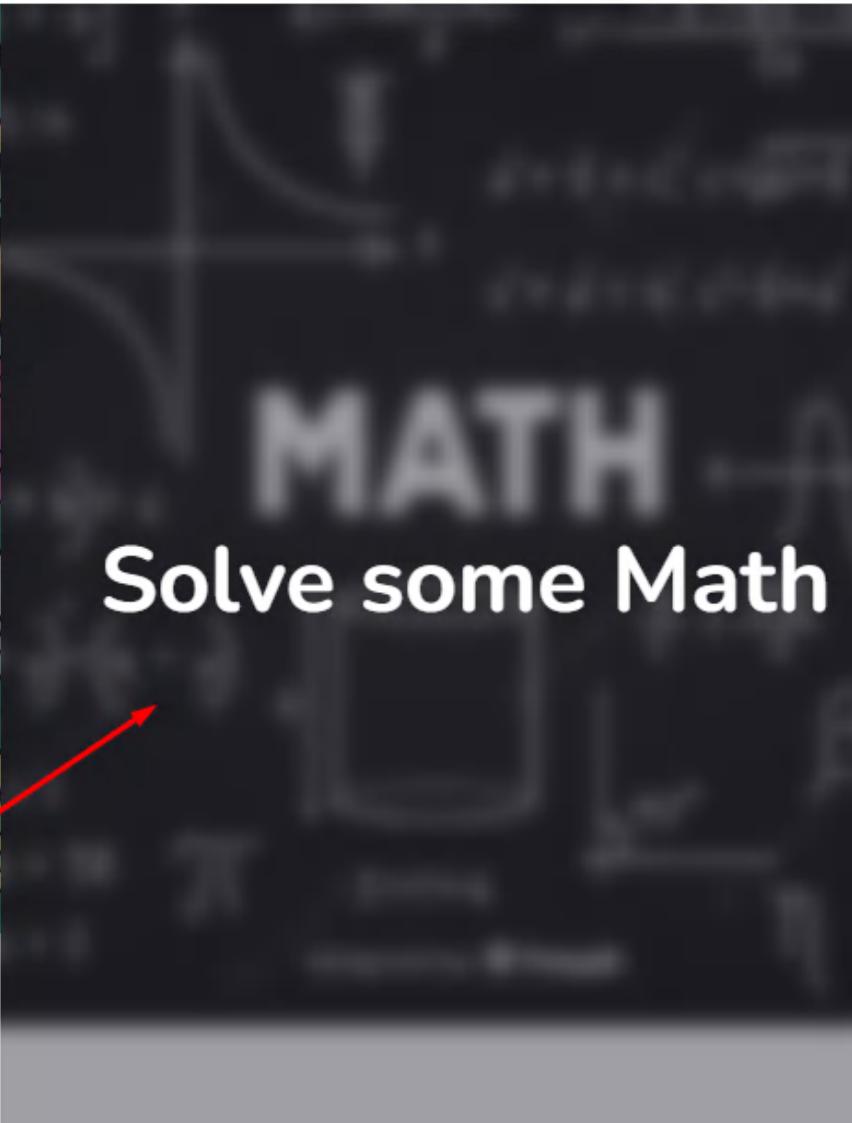
$z = y + 4$

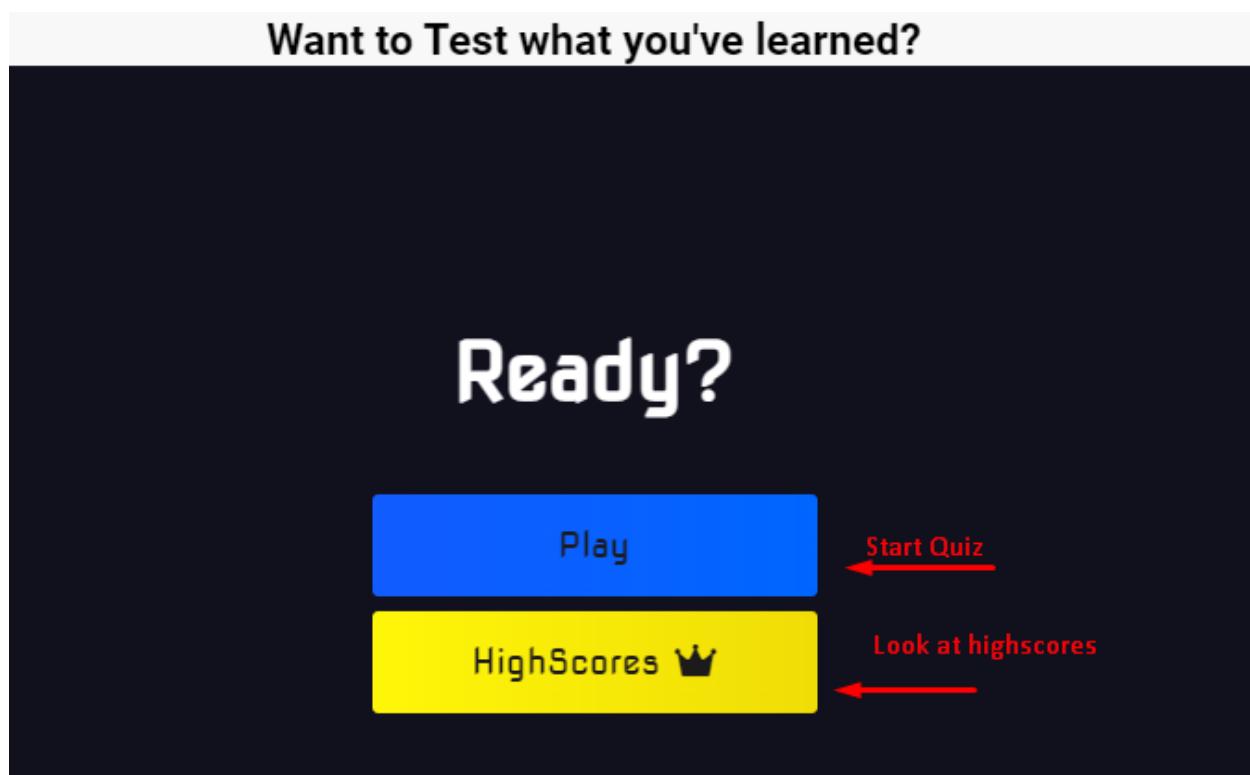


ources Grades and Achievements



Click on subject  
To enter





Want to Test what you've learned?

Question 1 of 4

Current quiz progress

Score 0

Current Quiz score

what is  $2 + 2$

Questions

A 2

B 4

C 5

D 3

A choice to select

Progress increases

Question 2 of 4

Progress increases

Score 100

Score updates with answer

what is  $10 + 6$

A 16

B 33

C 22

D 10

Green Indicates right answer

160

## **Chapter 9: Conclusion and Future Work**

## **Introduction to Future work:**

Here we will talk about everything that we plan on continuing in the future and that was unable to be completed in this short period of time.

ClassCloud is and will always be a vision that we poured our hearts into and hope to be able to add on to and learn from throughout time. in the end, whatever work is done is only to illustrate a picture of what could be, we hope to one day get to a point of technical knowledge and expertise to be able to make ClassCloud a household name that the Jordanian youth and parents can count on for their studying and educational needs and be a platform that connects people through the common goal of progress.

## **The Reasoning for more future work than expected:**

The main reason for some requirements not being able to be done is the underestimation of how long each increment should take with our time constraints being changed because of us having to start training earlier than expected

Combined with the smaller size of our team as this was a project meant to be done by three developers in graduation project one that later became a two people job in graduation project two due to personal circumstances pushing one of the members to not be able to continue, with one-third of the team no longer working on the project, we have applied and combined all our possible hours to get as much done as possible and provide an experience to the best of our ability with a high focus on testing and attention to detail.

## **Future work:**

- More Parent information about students
- An IOS and Andriod application for the entirety of the website
- Putting all the topics and sub topics
- adding more quizzes and questions
- adding more functionality to the Admin
- Give students more videos to learn from
- Add more tables to the database to store more information and display it to parents
- Add more interactivity to the pages with games and fun elements for students to play with
- Having a way to make and input our own content into the system quickly and efficiently
- Completing all grades from first to tawjihi allowing learning experience at every level

- Allow the parent to have more than one student
- Allow student to have the ability to give feedback to the website
- Adding a teacher actor and page where they can easily produce content
- having a social network of people that can comment on the course ask questions and receive answers
- Growing class cloud with marketing and hosting it on the web with a standalone domain
- enhancing performance and SEO
- Using Machine learning to know how much a student progresses and allow them to have a better understanding of how much they need to study to achieve a certain mark
- having actual past real examinations for students to study from especially for tawjih level students
- Adding a payment service to be able to access premium features or donate to developers
- Conducting more market research and implementing what the jordanian youth need
- Higher Security and password encryption

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