COMSATS University Islamabad, Lahore Campus

Assignment-I- Spring 23

CLO: <1>; Bloom Taxonomy Level: <Understanding>

Question:

Demonstrate your semester project by mentioning the following information

- Introduction of FYP
- Define problem statement of your FYP
- Define Scope of the Project
- List all major goals and objectives of your project
- Specify the success criteria.
- Give team structure
- Timeline chart

Assignment should be of 3-4 pages.

Note: Follow the sample proposal attached with this assignment statement.

1 Problem Statement

Students face problems when switching from online learning platform to some other app for live video session. Most of their time is lost in switching between apps and efficiency of online learning decreases. Other than that CS students also find it difficult to understand the different algorithms like Pathfinding and Sorting algorithms on board. So, our web-based app will solve all the problems by adding video conference on same space and also a module to visualise difficult algorithms.

2 Introduction

This project aims to create a comprehensive learning platform for students and teachers which is similar to Google Classroom and provides the additional features of live video calling and visualizing pathfinder algorithms and sorting algorithms. The platform will be easy to use with a user-friendly interface, allowing students and teachers to easily navigate through the platform, creating classrooms, posting assignments, providing feedback, and communicating with each other. It will also incorporate a live video calling feature which will enable teachers and students to collaborate in real-time. Additionally, the platform will provide a feature to visualize pathfinder algorithms and sorting algorithms which will allow students to better understand the concepts and provide teachers with an interactive platform to explain these algorithms. Overall, this platform will provide a comprehensive learning solution for students and teachers, providing an easy-to-use platform for collaboration, communication, and visualizing complex algorithms. This platform will enable teachers to create a more engaging and interactive learning experience for students and provide them with better tools to understand the concepts.

3 Success Criterion

i. The video calling feature should have an average latency of less than 2 seconds.
ii. The sorting and pathfinder algorithms should have an average time complexity of O(n log n) or better.
iii. No reported user experience issues with the additional features.

4 Related work

Related work on this project can be found in the areas of online education, video conferencing, and sorting algorithms. Online education has been a popular topic for many years, with many different approaches being developed and implemented. For example, Moodle and Blackboard are two of the most successful online education platforms, providing a wide range of tools and features for teachers and students. Video conferencing has also become a popular tool for communication, allowing for real-time conversations between multiple people. Skype and Google Hangouts are two of the most popular options for video conferencing. Finally, sorting algorithms and pathfinder algorithms are important topics in computer science, providing efficient ways to sort data and find paths through given data sets. Popular algorithms in this domain include quicksort, heapsort, and Kruskal's algorithm. These algorithms have been studied and implemented in various applications, such as efficient route-finding in GPS systems.

5 Project Rationale

This project is unique and highly interesting because of its target problem. As a Student I understand the needs of student. Many students find it difficult to join online session on different app. We will try to make it user-friendly by creating these features of video calling on single web-based app. It will enhance learning. Pathfinding algorithms like Bellmanford’s Algorithm and Bubble sort are difficult to understand but also very important in building Efficient projects. So, creating a visualizer these algorithms better. This will help them get the job in market as it will build their skill to solve a problem with less time complexity.

Aims & Objectives

Our project's major goal and target are as follows:

Objective 1: Make sure of Efficient online learning.

Objective 2: Introduction to Visualization of algorithms.

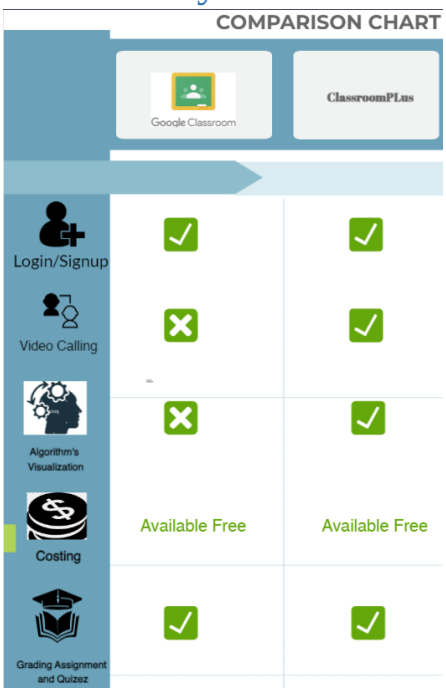
Objective 3: Aiming to use this product in the national and international levels.

Objective 4: Introduction of a proper learning platform with video conferencing.

Scope of the Project

Develop a Google Classroom platform with additional features of video calling and sorting algorithms and pathfinder algorithms.

6 Competitors/Competitive Analysis

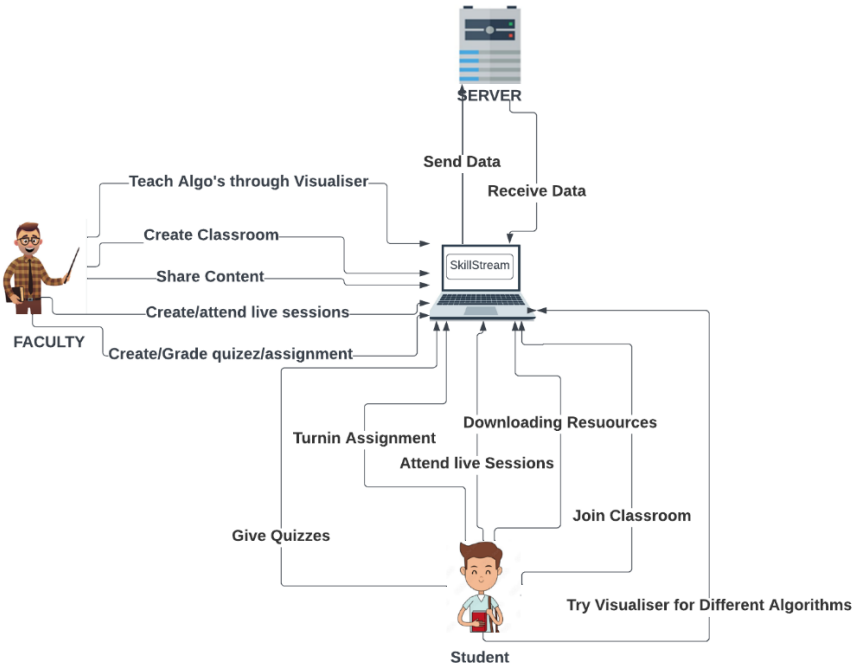


7 Proposed Methodology and Architecture

- **Agile-Scrum Methodology:**

The agile scrum methodology is a project management system that relies on gradual development. Each iteration consists of two-to-four-week sprints where the goal of each sprint is to build the most important features first and come out with a potentially achievable product.

- **High Level Architecture Diagram:**

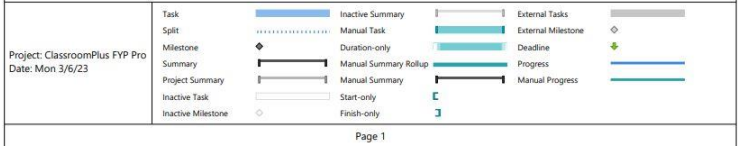


8 Individual Tasks

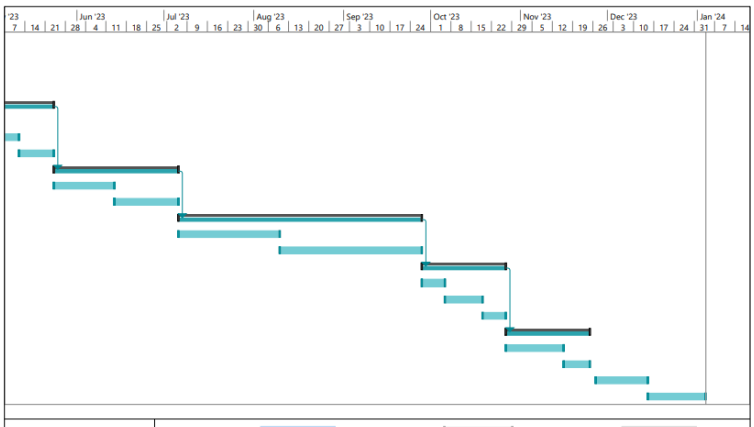
Team Member	Activity	Tentative Date
Zimam Ahmed	Design	Wed 05/24/23
Zeeshan Shahid	Coding	Thu 07/06/23
Zimam Ahmed	Testing	Thu 09/28/23
Zeeshan Shahid	Deployment	Fri 10/27/23

9 Gantt Chart

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Project Planning**	**12 days**	**Fri 3/24/23**	**Mon 4/10/23**	
2	Problem Identification	6 days	Fri 3/24/23	Fri 3/31/23	
3	Prioritizing Tasks	5 days	Mon 4/3/23	Fri 4/7/23	
4	Assigning Tasks	1 day	Mon 4/10/23	Mon 4/10/23	
5	**Analysis**	**31 days**	**Tue 4/11/23**	**Tue 5/23/23**	**1**
6	Requirement Gathering	7 days	Tue 4/11/23	Wed 4/19/23	
7	Detailed Analysis	16 days	Thu 4/20/23	Thu 5/11/23	
8	Process Diagram	8 days	Fri 5/12/23	Tue 5/23/23	
9	**Design**	**31 days**	**Wed 5/24/23**	**Wed 7/5/23**	**5**
10	Develop Prototype	15 days	Wed 5/24/23	Tue 6/13/23	
11	UML Diagram	16 days	Wed 6/14/23	Wed 7/5/23	
12	**Coding**	**60 days**	**Thu 7/6/23**	**Wed 9/27/23**	**9**
13	Front-End Development	25 days	Thu 7/6/23	Wed 8/9/23	
14	Back-End Development	35 days	Thu 8/10/23	Wed 9/27/23	
15	**Testing**	**21 days**	**Thu 9/28/23**	**Thu 10/26/23**	**12**
16	Unit Testing	6 days	Thu 9/28/23	Thu 10/5/23	
17	Integration Testing	9 days	Fri 10/6/23	Wed 10/18/23	
18	System Testing	6 days	Thu 10/19/23	Thu 10/26/23	
19	**Deployement**	**21 days**	**Fri 10/27/23**	**Fri 11/24/23**	**15**
20	User Manual	14 days	Fri 10/27/23	Wed 11/15/23	
21	Product Release	7 days	Thu 11/16/23	Fri 11/24/23	
22	**Training**	14 days	Mon 11/27/23	Thu 12/14/23	
23	**Maintenance**	14 days	Fri 12/15/23	Wed 1/3/24	



Page 1



Page 2

10 Tools and Technologies

MERN Stack will be used in this project.

Mongodb
Eexpress
React
Node js

- **Languages:**
  - **React.js and JavaScript:** For front-end of our project design, we will use these languages for better design.
  - **Monogodb:** For database creation of our project, we will use this technique.

- **Tools:**
  - **Visual Studio Code:**

Support for debugging, syntax highlighting, intelligent code completion, and code restructuring are only a few of its capabilities. This is compatible with Windows, Mac OS X, and Linux.

11 References

https://www.techopedia.com/definition/32364/adobe-photoshop
http://www.lucidchart.com
https://stackoverflow.com/questions/212039/what-should-students-be-taught-first-when-first-learning-sorting-algorithms
https://tutorials.visualstudio.com/vs-get-started/intro
https://edu.google.com/workspace-for-education/classroom/