Criterion A: Planning

Defining the problem:

My client, Mr. Raju Gurung, is an IBDP Physics teacher. He is very enthusiastic and passionate about Physics and also about teaching his students. However, after the classes moved online because of the pandemic, he seemed slightly frustrated by the technical difficulties that came along with these classes. He mentioned that he did not like his class time being wasted because of these technical problems. Sometimes he even talked about this in class with his students. On top of all these technical difficulties wasting class time, he said that taking attendance is another addition to the problem; it takes longer than it should and wastes more of his class time.[1]

After seeing that he was having problems that affected his classes, I, being a Computer Science student, realized that maybe I could help. It would be like hitting two birds with the same stone. I would not only have made online classes a little smoother and easier for my teacher but also would have material for my Internal Assessment.

To get a basic idea of what my client was looking for, I asked him a few questions in an interview.[1] After this interview, I requested him to send me an email with the specific requirements or features he wanted in the software.[2]

My computer science teacher, Mr. Prayaschit Bhandari, is my advisor and I am sure that he is going to guide me well throughout this process.

Word Count: 237

Rationale for solution:

After looking at the requirements my client presented[2], I decided that it would be best for me to use Python along with a few libraries. It is easy to do Object Oriented Programming (OOP) with Python and OOP is important considering my client's requirements. OOP allows creation of classes allowing abstraction which on top of the simple and readable syntax of Python makes developing my software efficient and easy. The inheritance and polymorphism features of OOP also assist in developing a software in an efficient manner specially when using an external libraries. Furthermore, Python also allows the use of SQLite database easily with its own library.

I will be creating a GUI based application which will be using the Kivy library for Python. Kivy is an open-source library made for the development of interactive GUI based applications with Python. The main reasons I am using the Kivy library are:

- It consists of 'widgets' which are essentially classes that I can use in my program easily so GUI designing is easy and fast
- The use of a separate .kv file where we write the Kivy language just for programming the GUI allows abstraction which helps me develop the application fast and easily.
- It is free and open source
- It is made for Python, so, I can connect the program and GUI easily

1 See Appendix A.1: Interview with client
2 See Appendix A.2: Email from the client specifying the requirements

- It is supported across platforms (Windows, OSX, Linux, Android, iOS)
- I am familiar with this library as I have used it extensively before

Word Count: 251

Success Criteria:

After successfully fulfilling the following criteria, my software will be a success:

1. Create a user-friendly GUI that is easy to understand, intuitive and the user can take attendance in the least amount of clicks possible
2. Ensure privacy using login credentials including username and password to access, create, update and delete records
3. Store login credentials in a database securely by storing the hashed versions of passwords
4. Create a sign up page where a user can register a username and password in order to login
5. Allow multi-account creation
6. Generate a spreadsheet organized in a manner that is easy to view and understand containing student name (sorted alphabetically), date and presence
7. Store the spreadsheet (records) of each user in a secure manner by using password protection
8. Allow user to create, delete, update as well as view records stored in a spreadsheet containing the attendance
9. Give user the ability to add/remove students from already created records
10. Allow user to search for previously created records
11. Prompt the user to input the Zoom chat file with which to update the attendance record and update the record according to the chat file
12. Display alert messages if any wrong data has been entered during entering login credentials, signing up and creating, updating or searching for records