Evaluation

Timescales Evaluation

To begin with the evaluation with the project, I am going to look at how well I did on the time aspect of completing the project and each section within it. There will be a maximum of 3 colours that I will use within the 'Outcomes' column for any table within the evaluation. The times are approximate and have been used with the documented time in Microsoft Word (as I had separate documents for each of my sections then combined them into one final document at the end).

A **GREEN** background will mean that I have been entirely successful in meeting my objective or going above and beyond it/ being within the allocated time.

An **AMBER** background will mean that I have not been entirely successful in meeting my objective or have gone over my expected timescale (within 20% over the allocated time).

A **RED** background will mean that I have not been successful at all in meeting my objective/ or have exceeded my timescale by a significant amount (greater than 20% over the allocated time).

Task	**Allocated Time**	**Outcome**
Analysis and Research	10 Hours	9 Hours
Design	12 Hours	13.5 Hours
Technical Solution (Programming)	25 Hours	27 Hours
Technical Solution (Alpha-Testing and Documentation)	6 Hours	7 Hours
Beta-Testing (External Users)	1 Week (for users to use and feedback on the program)	1 Week
Evaluation	2 Hours	1.5 Hours

NOTE: I completed the **Outcome for this *Evaluation* section** after completing this evaluation section.

Overall I did well on completing my project in the timescales that I had set. My client's expectation was the completion of the project within about 2 months of the start of the project. Although I had achieved that expectation, it required me to allocate more time to complete the project on a few occasions that I had not expected. As you can see from the table above, these occasions occurred during the Design Stage and both parts of the Technical Solution Stage. This is as a result of underestimating the time it took to complete certain sections of code and planning on how to create my code, such as for the Interactive Revision Sections of my application. Ensuring the GUI was up to the standards that my client wanted also increased the amount of time I had spent programming the application. However, I still achieved the overall time deadline for the project which means the overall timescale of the project has been successful.

As an improvement, if I were to tackle a similar project in the future, I would plan my time more carefully and break it down further. This would include looking at each planned objective and estimating how long each of those will take to complete through programming. I would also try to improve the time it took me to test out a piece of code and place it in the document, as I was unnecessarily picky on the formatting of my document.

Objective's Evaluation

This will follow the same colour coding scheme as the Timescale Evaluation above, and this is a direct reference to how well I have completed each objective which was expected by my client. These will also be discussed after the table.

No.	Objective	Performance Criteria	Outcomes and Comments
1	An easy-to-use GUI	Colour coding with clear buttons for the user to navigate around the system.	I have been completely successful in creating my GUI to my client's standards
2	An account system where each user has their own account with a username and password.	**A)** Usernames must be unique. **B)** When logging in, the password should be hidden by asterisks. **C)** The password should be stored in the database as a hashed value (no plaintext to improve security)	There is a full account system for both students and teachers that meets all performance criteria of this objective and works successfully
3	Practice tests section for any combination of topics with ranges of difficulty that change based upon user achievement within the test or in prior tests.	**A)** Take in student test data and run different functions to work out how they're making progress **B)** Questions should be marked by the program using keyword recognition/ Number recognition.	There is a full testing section for the topics included in the application which uses a list of answers that are matched to user inputs rather than multiple choice. The progress features are extensive as my client has tested

4	A support section for revision which includes at least one game to prevent boredom and increase student's memory of the topic.	**A)** The first game developed must be 'S.I.' and if time is available then continue down the priority game list defined beforehand. **B)** An efficient leaderboard sorting system to rank players.	A fully working mathematics take on the Space Invaders game has been implemented with an efficient Merge Sort leaderboard system.
5	A database linked to the program to store all student details and information, so the teacher can easily see what each student has done, their strengths and weaknesses and how long they've spent using it.	**A)** Implementation of the database should be completed within Python for efficiency **B)** The database must contain several related tables which cover all aspects of data storage of the application	The database has been completely created with all the required tables and relationships. All performance criteria for this objective have also been met.
6	Progress tracking for students Class overviews for the teacher (my client).	Have a tracking section with the ability to output tables on the specific data received for that particular user. Allow the teacher to check specific students' progress.	Extensive progress tracking features for both student and teacher have been implemented using the database to its full extent through advanced SQL queries
7	Have 3 major maths topics from Differentiation, Integration, Trigonometry, Vectors, Data analysis (statistics) – this can involve the study of probability distributions and measures of central tendency	Each topic should have its own set of revision materials to help the student revise.	I have included 4 major maths topics from the initial list (differentiation, integration, data analysis and trigonometry) with useful and fully working interactive material for the students.
8	Create an automatic meeting scheduler for one-to-one meetings for the teacher and student	**A)** Require input of each user's timetable for their account to ensure both parties are available for the meeting **B)** Send an e-mail to teacher and student	Scheduling system works entirely with the additional email notification request from my client working as expected. Timetables stored in the database and are linked to the user as required.

Overall Evaluation

From the full completion of each objective to a high standard, I have succeeded in meeting the expectations of my client and end users. The Beta Testing comments that I had received supported this conclusion as my client was delighted with the application that I have produced for him. The students had also found the application useful for their revision in Mathematics which was a core purpose of the application. I, therefore, feel that this project has been successful.

I have gained some valuable insight into advanced programming projects of this nature. Through the in-depth analysis of the requirements of the application, I have improved my research and referencing skills. I also have improved my ability to make predictions on how some processes may work through analysing external products with a limited scope on seeing their code. Understanding the needs of a target audience was also very useful as it made me conduct my own 'market research'. This led me to analyse the data I received from my surveys and questionnaires, and as a result, I amalgamated the best features from external products from a student's perspective into one application. This was highly beneficial to me and will be very useful in the future for projects of a similar nature that I may undertake.

Designing the elements of the program in great detail allowed me to make several efficiency improvements and ensure that when I was ready to program, I was not wasting time thinking of how I could code the functionality required. It also gave me strong guidance when doing the project and meant that the final product reflected the wishes of my client and met all the agreed objectives. The testing of the program also introduced me to the idea of scrutinising the code and figuring out where common places of error may lie in the program. This led me to introduce several exception/error handling blocks of code and meant the overall application would work more smoothly for users.

If I had more time, I would make a few improvements to the application to make it even better. To make it a full Mathematics revision application, I would create revision material for every single topic in the Mathematics A-Level. This would also come with the addition of a vast array of questions so that the application is always fresh for users. Covering all possible topics would allow the application to be beneficial to the greatest number of people. This is because students would be able to choose a topic they are struggling with and know for certain the interactive revision materials are available on this application. Another improvement that I would make, if I had more time available for the project, is the addition of new mathematics integrated revision games such as the Maths Invader game. This would ensure that students will stay active on the application and reduce the problem of boredom even further.