# Criterion A

**Word: 470**

## Defining the problem:

The client is a **primary PE teacher** who has been teaching PE for 12 years [line 5, Appendix A]. During these years, he had incorporated several apps within his lessons to accurately analyse a player's skill and effectively provide feedback. However, he ran into an issue: these apps are not applicable to analysing T-ball players, leading to slower improvements [line 34, Appendix A].

After consulting with my client [Appendix A], he mentioned that initially wanted an app on a phone or tablet that would help him input, analyse data and provide feedback for T-ball players [Appendix B]. He also wanted his students to be able to view the statistics and feedback received [line 43 to 44, Appendix A]. In response to his request, I informed him that analysing the batter was the only feasible solution for a simple app [line 200 to 201, Appendix A]. He then suggested to me a few possible characteristics of a batter that can be analysed which includes their speed, batting accuracy and more which is possible to calculate through inputs such as the number of bases run, time, number of strikes and more.

## Rationale for the proposed product:

The software will be developed as an app for the following justification:

- Since my client needs to analyse data of many T-ball players, apps would execute complex calculations and analysis T-ball players much more quickly than websites
- As my client will be using the software regularly, apps would be more efficient than websites - data can be stored locally so it's faster to launch and login

As for the programming language, I will be using Dart for the following reasons:

- Dart is used in a UI software development kit called Flutter, allowing for a more user-friendly GUI
- Dart/Flutter can operate in both Android and iOS, unlike Java, which allows my client and the students to use it on a variety of devices that uses these two OS
- Dart is an object-oriented program which comes with many benefits including:
    - Program is made more efficient through inheritance, a feature in OOP that can prevent code duplication and data redundancy
    - Polymorphism also prevents code duplication as functions in a parent class can adapt to different classes
    - The two features described above also makes the developmental process less time-consuming
    - OOP allows easy modifications to different features of the program as it does not interfere with the rest of the program while doing so

For storage, Firebase will be the primary database for the software because:

- Data is stored in the cloud, allowing students to view their statistics at home with WiFi
- Since this program similar to a big data application, a NoSQL database structure - Firebase - is more suited for this than MySQL because it has better scalability
- Firebase is open-source, unlike MS Access
- There are ample resources and tutorials to integrate Firebase with Flutter/Dart

## Success criteria for the product

1. Invalid email format and password would be rejected upon signing up or signing in
2. Students or teachers can create a new student or teacher account which is then stored into the database
3. Students and teachers can log into their account once the inputted email and password matches with the accounts previously stored in the database
4. Students are able to join classrooms they want to enter by inputting the correct classroom ID
5. The program allows teachers to create, name, enter and delete classroom selected; input, edit and delete students statistics and feedback for T-ball players; remove student selected from the classroom
6. The program can validate inputs and edits made by the teacher to the student's statistics and feedback
7. The program can calculate the data inputted and display results to both teachers and students in the form of numbers and graphs including the average percentage accuracy and effectiveness as well as the average speed run and batting in the past 30, 60, 90, 180, 365 days or all-time depending on the selected time period
8. Students are able to view the teacher's feedback
9. Database stores teacher's classroom ID, inputs; students within the classroom and student's t-ball statistics