Maddox Scott

Mr. Pierson

IB Computer Science, Period 1

27 January 2022

Criterion A: Planning

Scenario

Client /Advisor:

My client is going to be Christopher Mills, one of my father's coworkers, and is a family friend. Him and my father are avid cyclists, even competing several times a year. Christopher has been road-biking for over six years now, and consistently strives to improve.

My advisor is going to be my father, Sean Scott. He has a thorough background in software engineering, with a masters degree in computer science from the University of Texas, Austin. Sean has been working at Amazon for over ten years, and is very familiar with the process of developing, testing, and improving software. If I have any questions, he will be the first person I speak to.

Initial Consultation with Client:

Refer to Appendix (B.1) for the full initial consultation.

Scenario / Problem:

Many athletes, including runners, swimmers, and cyclists, record their activities using GPS tracking apps on their devices. These apps are excellent at recording important information related to the activity, such as distance traveled, total time, average speed, and calories burnt. However, as brought to my attention by Chris, all of the commonly-used tracking apps lack methods of meaningfully viewing this data on a larger scale, such as comparing a ride's route

and statistics to another ride's route or statistics Appendix (B.1). The ability to compare one's ride's statistics to a previous ride's could provide essential information relating to progress and improvement. In addition, none of the popular tracking apps have a method of viewing statistics within larger time intervals. The ability to evaluate long-term statistics or evaluate one's performance between two rides would be highly beneficial in improving one's performance.

Solution to Problem:

After evaluating the problem, I have decided to program a mobile application for IOS using Flutter and Dart, capable of importing GPS activity files and visually comparing statistics between the files, as well as evaluate accumulated statistics from each GPS activity file.

Solution Rationale:

Christopher uses his iPhone to record his cycling rides. He would like to keep all of his cycling applications on a single device, so the application will function on IOSAppendix (B.1). In addition, he uses the GPS tracking application *Strava* to record his rides. He is satisfied with the app's GPS tracking abilities, and does not require another app to perform the GPS tracking functionality. Strava rides are saved as GPX files, which include the geographic routes, as well as any other statistics related to the ride. Dart and Flutter will provide a means of programming an app capable of running on IOS, and possibly on other devices. Flutter also contains public libraries dedicated to importing and displaying GPX files, and even has a public library dedicated to Strava integration. Lastly, by making the solution a digital application. It will be able to display ride statistics in a more meaningful way, by adjusting its display to convey data more efficiently. This is a good IA project for myself as it will teach me many new coding concepts such as state management and file I/O.

Success Criteria:

1. The application must be able to read GPX activity files recorded from *Strava*, which the application will then be able to assign important statistics, such as route, date, duration, distance, and speed, which will be saved locally.
2. GPS routes that are imported should be visibly displayed in a map when requested, with tools such as being able to zoom in or out.
3. Users should be able to pick two imported activities, and the app will visually compare important statistics such as duration, distance, and average speed. Visual elements should be used to make comparing easier Appendix (B.1).
4. The application must prompt users to sign in when launching the app. User credentials must be saved locally, and activities imported must be linked to a specific user
5. The application must be able to display total, accumulated stats, such as “total distance biked” or “total time spent biking”. The app must also be able to view every imported GPS route in a single, cohesive map.
6. The application must have the ability to delete imported activities, and have the deleted activities not affect accumulated stats.
7. Implements an easy to use UI, with high-contrast fonts and visuals, and avoids small and light-gray text. Also implement simple animations for visual elements Appendix (B.1).

Word Count: 494 words