BSCH – MD- Assignment 03
Exercise Tracker

1. Assignment Information

Course	BSCH
Stage/Year:	4
Module	Mobile Development
Semester	1
Assignment:	3
Date of Issue:	01 December 2021
Assignment Deadline:	20 December 2021
Assignment Weighting:	20% of Module
Assignment Submission:	Moodle

2. Introduction

You have been tasked with creating an exercise tracking application which will sample user movement via sensors.

2.1 Required Features (high-level)

In this assignment you will be tasked with creating an application that will record information and show analysis regarding a user's walking/running trail. Your application should have the ability to record the GPS points corresponding to the user location. It should take a GPS point every 5 seconds. All GPS points should and stored in a GPX file (XML based file format) A sample of which you can find here: https://en.wikipedia.org/wiki/GPS_Exchange_Format#Sample_GPX_document. When the user finishes recording the trail, the GPX files should be stored in external storage (accessible to anyone) and some information should be displayed to the user about the journey they have just made. It is expected that you display the following information about a user's journey:

- Average speed
- Total distance
- Time taken
- Minimum and maximum altitude
- A graph of the user's speed during the trail/journey (Custom control).

These statistics should be shown in a separate activity. The graph should be shown in a custom view. The custom view can be display only and does not need to be reactive to touch. All activities should be implemented with standard UI elements that are available with the standard SDK. Do not use any additional libraries.

In summary, your application will be built around two activities:

1. To start and stop the exercise tracker
2. To report on what was recorded

The layout and design are entirely up to you however you will be required to justify the design and layout of your UI and CustomView. This will be required in the documentation you will provide.

You will also be tasked with implementing additional feature(s) of your choosing. It will be entirely your own choice but be aware that the complexity of the feature will be considered when it is being marked.

The following components should be implemented with the following high-level features:

1. **MainActivity**:
   - Display some suitable controls to
     a. Start and stop the tracker
     b. Explain how it works
2. **ReportActivity:**
   - Display suitable controls to
     a. Report on metrics which have been recorded
     b. Graph the metrics which have been recorded

2.2 Milestones

Take note of the milestones listed below. These are meant to be completed in order. If you skip a milestone or trigger one of the failing conditions, the following milestones will not be considered for marking. For example, if there are six milestones and you fail the third one, then the fourth, fifth, and sixth milestones will not be marked.

Reduced marks will be awarded for the presence of errors anywhere in the code. Validate input to ensure that it is sensible. Also note that the percentage listed after the milestone is the maximum mark you can obtain if you complete that many milestones without error.

2.2.1 Coding Milestones (70%)

1. Generate the shell of an application consisting of two activities. The second activity should only be triggered when recording is stopped.

   (10%)
2. Add support for starting and stopping the recording of GPS points. When a new recording is started, a GPX file should be started (filename is current date and time, GPX file must be in external/shared storage in a directory called GPStracks) and GPS points should be written to it as each GPS point is received. When recording stops close the file and move to the next activity.

   (20%)
3. In the second activity, generate the statistics for average speed, total distance, time taken and minimum and maximum altitude. These should then be displayed.

   (30%)
4. Add in a custom view to the second activity that will represent a graph of the speed over the entire journey. You may assume that for the Y axis, speed will only be between 0 and 10 Km/h. For conversion purposes you may assume that 1 m/s is equal to 3.6 Km/h.

   (60%)
5. Add a custom feature of your choosing. The relevance, usefulness and quality of implementation will be taken into account for grading

   (70%)

2.2.2 Documentation Milestones (30%)

1. Document why you designed the UI the way you did. Include adequate graphics such as wireframe diagrams and screenshots. Detail the key choices taken in application navigation, widget layout and position and how they support user interaction. Don’t include instructions on how to operate the App or the UI.

   (15%)
2. Give a high-level description of all methods in your Java code including the data- structures used.

   (30%)

3. Submission Format

A single file with the following details

- **Name**: FirstName_LastName_StudentNumber_Ass3
- **Compression format**: zip
- **Folder Name**: FirstName_LastName_StudentNumber_Ass3
- **Folder Contents**:
  1. Folder: Ass3 (contains the Android Project) - Ensure that all layout and code components are contained in the archive. Missing components will result in reduced marks.
  2. File: Document.pdf
  3. Other files such as jpegs of initial drawn designs or use cases

4. Penalties:

	Penalty	%	Comment
1	Non-Executable code submitted	-50	It should be possible to open your project and compile and run it without having to correct syntax errors.
2	Non-standard libraries used	-50	The standard SDK provides everything that is needed for the assignment. No additional libraries will be downloaded for the purpose of correction or marking.
3	Wrong compressed file format	-100	Only zip archives are accepted. Any other format will not be opened and therefore receive no grade.
4	Wrong folder structure	-100	Use only the .pdf format for your documentation. If you do not provide any documentation, your code will not be marked. Although for illustration purposes, code snippets of 2 to 3 lines are useful, copying and pasting large sections of code does not constitute documentation.

5. Things to reflect on

The following questions may assist you in completing this assignment

- What resources do you have which will help?
- Where would you look to gain additional resources?
- If you are unsure how to proceed what will you do?
- Build you own solution from scratch, so you master the process.