BSC-MD Assignment 3: TrackMaster

1 Assignment Information

Course: BSC
Module: MD
Title: TrackMaster
Description: Create an application to record a user's walk/run trail and show trail statistics.
Assignment: Assignment 3
Date of Issue: 23. April 2020
Assignment Deadline: Sun 10. May 2020
Assignment Submission: Upload to Moodle
Assignment Weighting: This is the third of three assignments and is weighted at 20% out of a total of 50% for all three assignments.

2 Introduction

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 librairies.

3 Assignment Submission

Create a .zip archive of the finished project. Include the required documentation as a .pdf file entitled ‘documents.pdf’ in the root directory of the project. Ensure that all layout and code components are contained in the archive. Missing components will result in reduced marks. Upload the archive containing code and the documentation file using the link provided on moodle. Note that archive formats other than .zip will not be marked.

Please note the following:

• Use only the .pdf format for your documenation. If you do not provide any documentation, your code will not be marked. Copying and pasting code into a PDF file does not count as documentation.

• Code that fails to compile will incur a 30% penalty before grading. It should be possible to open your project and compile and run it without having to fix syntax errors.

• The use of libraries outside the SDK will incur a 50% penalty before grading. The standard SDK provides everything that is needed for the assignment. No additional libraries will be downloaded for the purpose of correction or marking.

• The standard late penalties apply

Very Important: Take note of the milestones listed in Section 4. 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.

4 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 recieved. 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, usefuleness and quality of implementation will be taken into account for grading (70%)

5 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%)