Documentation
of
Assignment 03 - Exercise Tracker

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Course Code   : BScH
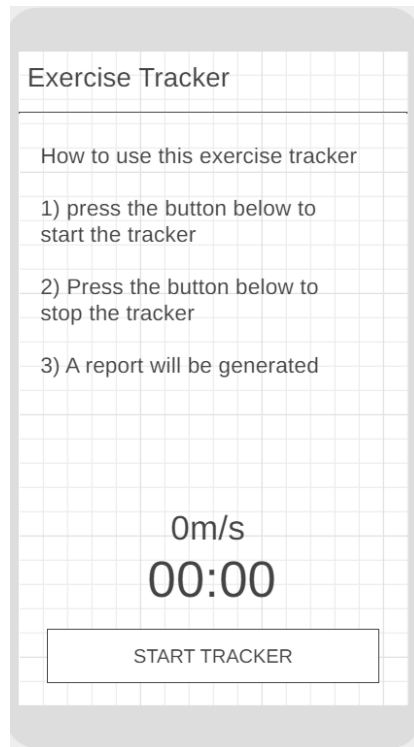
Stage   : 4

Subject   : BScH-MD

Contents

Wireframe

Exercise Tracker

How to use this exercise tracker

1) press the button below to start the tracker

2) Press the button below to stop the tracker

3) A report will be generated

0m/s

00:00

START TRACKER

This is the design of the main page before press the button.

Exercise Tracker

How to use this exercise tracker

1) press the button below to start the tracker

2) Press the button below to stop the tracker

3) A report will be generated

3.034m/s

08:45

STOP TRACKER
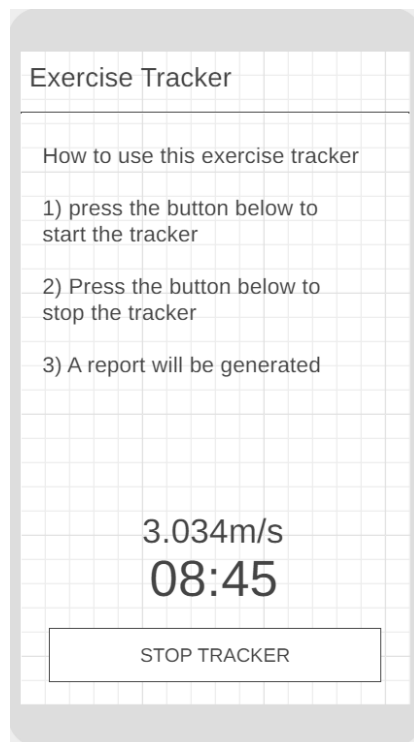
This is the design of main page after pressed the start button.

Exercise Tracker

How to use this exercise tracker

1) Press the button below to start the tracker

2) Press the button below to stop the tracker

GPS is off

GPS is not enabled. DO you want to go to settings menu?

CANCEL SETTINGS

0m/s

00:00

START TRACKER
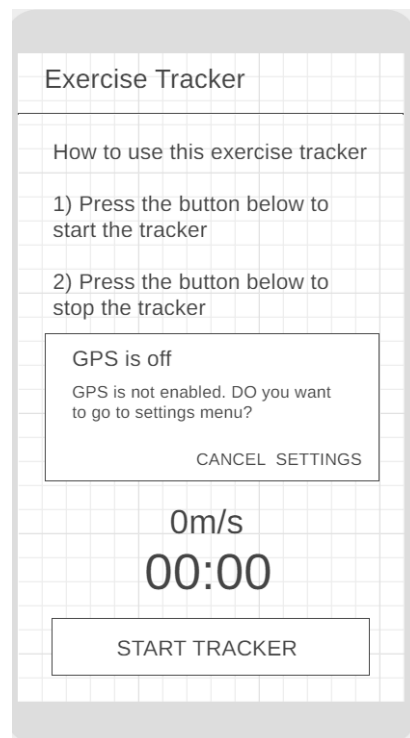
This is the design for confirmation of action.

← Exercise Tracker

Report

Average speed:	2.75m/s
Total distance:	570.2m
Time taken:	137s
Minimum altitude:	74.5m
Maximum altitude:	77.2m

km/s

10
9
8
7
6
5
4
3
2
1

Time(s)
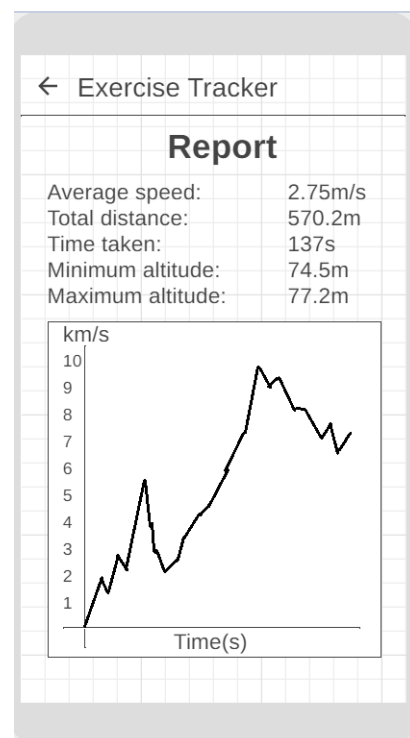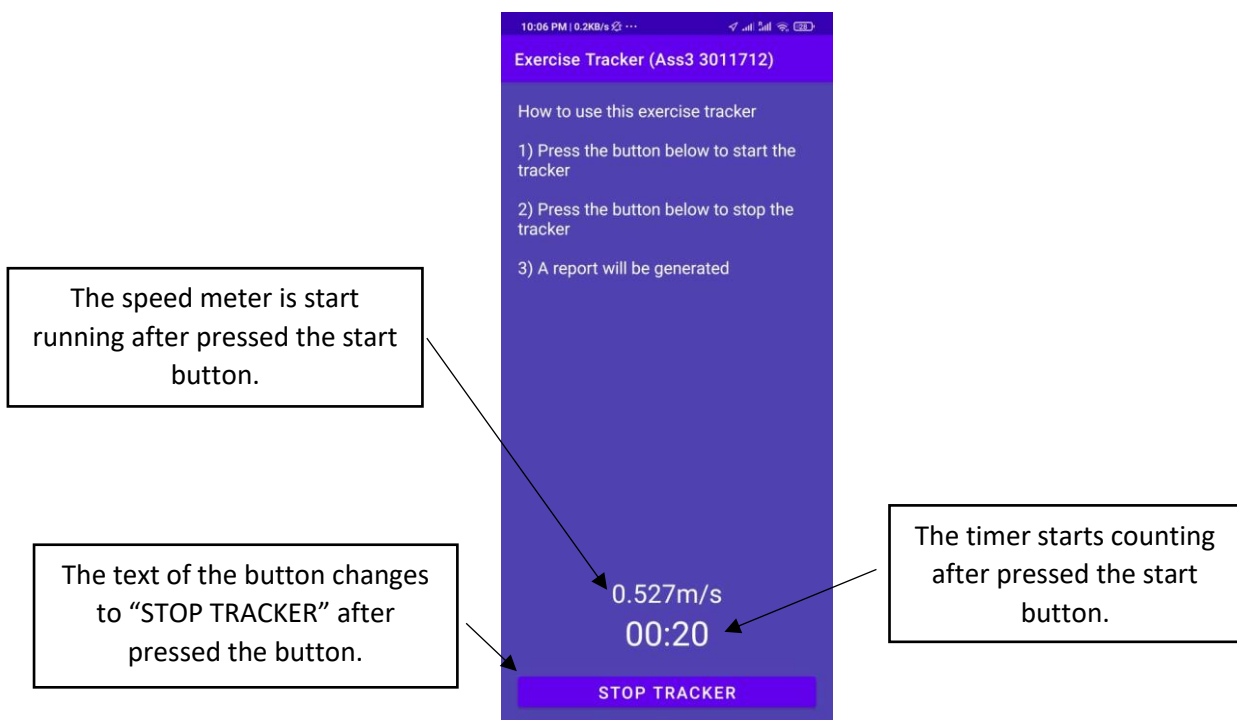
This is the design of report page.

Screenshot

The screenshots below are captured from Xiaomi 9 with API29.

The instruction view is implemented by using the text view.

- Teach user how to use this application

This "START TRACKER" view is implemented by using Button.

- Allow user to start the tracker

This speed view is implemented by using text view.

- Tell user the current speed

This timer is implemented by using chronometer.

- Tell user the time after pressed the start button
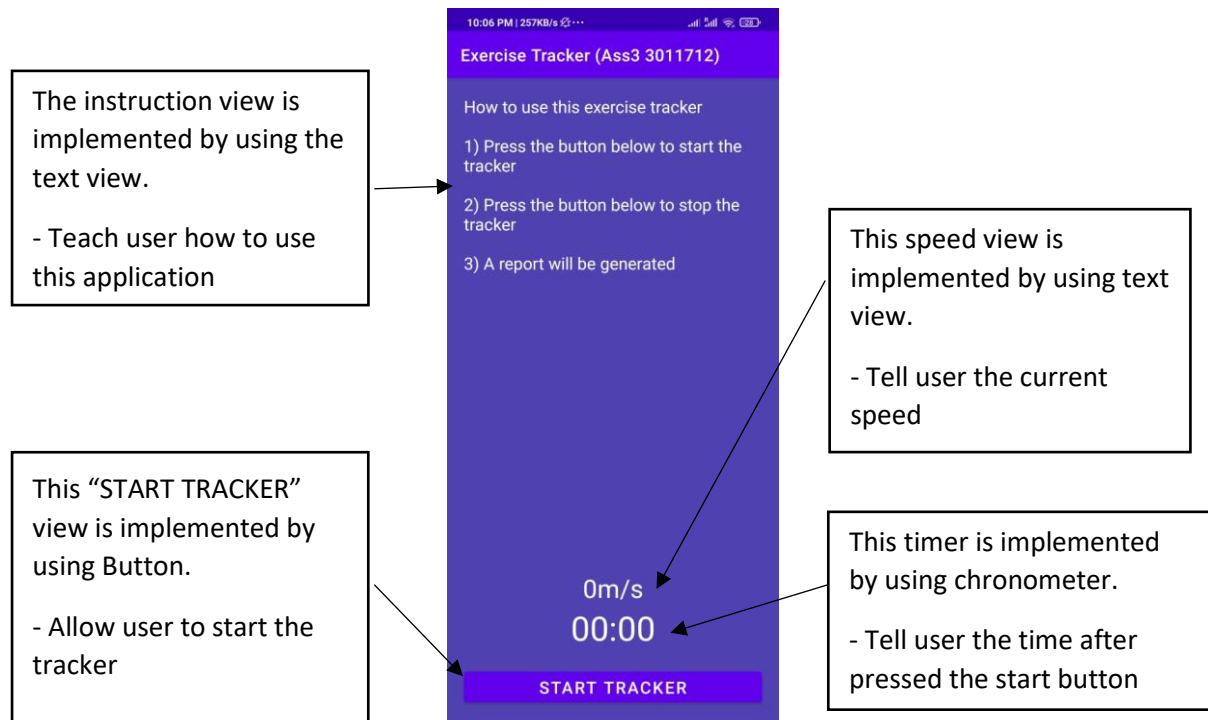
This is the screenshot of main page before press the start button.

The speed meter is start running after pressed the start button.

The text of the button changes to "STOP TRACKER" after pressed the button.

The timer starts counting after pressed the start button.
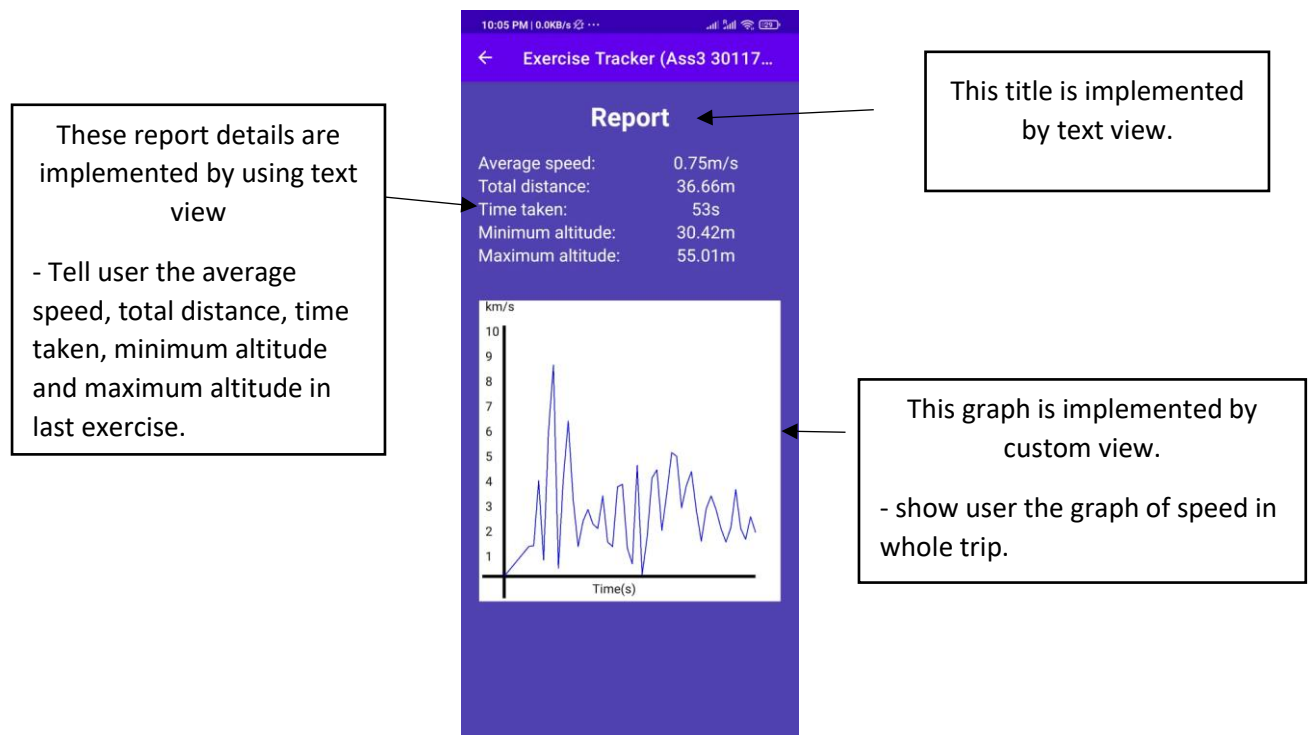
This is the screenshot of main page after pressed the start button.
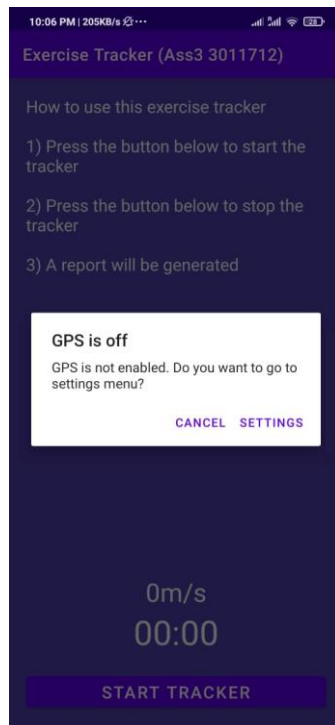
This is the screenshot of alert dialog box when the GPS is not enabled after presses the button.

These report details are implemented by using text view

- Tell user the average speed, total distance, time taken, minimum altitude and maximum altitude in last exercise.

This title is implemented by text view.

This graph is implemented by custom view.

- show user the graph of speed in whole trip.

This is the screenshot of report page which will be generated when the exercise tracker is stopped.

GPX file

2021-01-24T17:16:38Z

```xml
<gpx version="1.1" creator="Ass3_3011712">
    <trk>
        <name>Exercise Tracker</name>
        <trkseg>
            <trkpt lat="3.199836" lon="101.650749">
                <ele>15.17</ele>
                <time>2021-01-24T17:16:54Z</time>
                <speed>0</speed>
            <trkpt lat="3.199989" lon="101.650492">
                <ele>-0.28</ele>
                <time>2021-01-24T17:16:55Z</time>
                <speed>33.1</speed>
            <trkpt lat="3.199954" lon="101.650528">
                <ele>-10.61</ele>
                <time>2021-01-24T17:16:56Z</time>
                <speed>5.52</speed>
            <trkpt lat="3.199968" lon="101.650515">
                <ele>-10.1</ele>
                <time>2021-01-24T17:16:57Z</time>
                <speed>2.07</speed>
            <trkpt lat="3.19991" lon="101.650516">
                <ele>-2.61</ele>
                <time>2021-01-24T17:16:58Z</time>
                <speed>6.35</speed>
            <trkpt lat="3.199728" lon="101.650773">
                <ele>16.2</ele>
                <time>2021-01-24T17:16:59Z</time>
                <speed>34.99</speed>
            <trkpt lat="3.199706" lon="101.650811">
                <ele>18.59</ele>
                <time>2021-01-24T17:17:00Z</time>
                <speed>4.82</speed>
            <trkpt lat="3.199701" lon="101.650787">
                <ele>25.15</ele>
                <time>2021-01-24T17:17:01Z</time>
                <speed>2.66</speed>
            <trkpt lat="3.199712" lon="101.650792">
                <ele>9.43</ele>
                <time>2021-01-24T17:17:02Z</time>
                <speed>1.35</speed>
            <trkpt lat="3.199706" lon="101.650799">
                <ele>11.47</ele>
                <time>2021-01-24T17:17:03Z</time>
                <speed>0.98</speed>
            <trkpt lat="3.199696" lon="101.650802">
                <ele>14.41</ele>
                <time>2021-01-24T17:17:04Z</time>
                <speed>1.23</speed>
            <trkpt lat="3.199696" lon="101.650804">
                <ele>14.75</ele>
                <time>2021-01-24T17:17:05Z</time>
                <speed>0.19</speed>
        </trkseg>
    </trk>
</gpx>
```

This is the example of GPX file which generated by this application.

Files

MainActivity.java – generate main page of the application

- startTracker() – a method will be called every time the start button is pressed. It starts the timer, speed meter and etc.
- stopTracker() – a method will be called every time the stop button is pressed. It stops and reset the variable. It starts ReportActivity.
- creteLocationListener – a method to create location listener.
- locationEnabledChecker() – a method to check if the location is enabled and generate alert dialog if the GPs is not enabled.
- calculateSpeedMeter() – a method to calculate the speed of the location.

ReportActivity.java – generate report page

- generateGraph() – a method to set the data of graph

GPXWriter.java – receive the locations and write it into gpx file with gpx format.

- startWriting() – a method to create a gpx file with current date time and write gpx format into file.
- addLocation() – a method to receive locations details and write the locations into gpx file with gpx format.
- stopWriting() – a method to write the last part of gpx and close the buffered writer.
- getFileName() – a method to return the file name.

GPXReader.java- receive the file path and retrieve the information of location from gpx file.

- convertElements() – a method to save all the location details in the file to variables. Use regular expression patterns to match the gpx format.
  e.g. "<trkpt lat=\"(\\d+\\.\\d{6})\" lon=\"(\\d+\\.\\d{6})\">"
- getAverageSpeed() – a method to compute the average speed and return it.
- getTotalDistance() – a method to compute total distance and return it.
- getMaxAltitude() – a method to compute a maximum altitude and return it.
- getMinAltitude() – a method to compute a minimum altitude and return it.

SpeedGraph.java – A custom view to represent a speed graph

- init() – a method to initial all the variables.
- onDraw() – a method to draw the ui.
- drawTwxtOnYaxis() – a method to draw y axis text.
- drawTextOnXaxis() – a method to draw x axis text.
- drawAxis() – a method to draw x and y axis
- drawGraphPlotLines() – a method to plat the speed and time points on the graph
- setdata() – a method to set data of points