Android Smartphone Programming
http://proglang.informatik.uni-freiburg.de/teaching/androidpracticum/2015/

Exercise Sheet 5

1 GPS Notification (20 points)

In this exercise you will extend the *To-Do List Manager* from the previous exercise. *Alternatively, you can use the implementation from exercise sheet 3 or the sample solution from the course web page.*

First, you are required to add the possibility to define a *To-Do Item* with a GPS location. Locations will be defined by *contacts (their addresses)* and *Google Maps*. Notify the user when he is close (e.g. a 100 meter radius) to the corresponding location.

The following features should be supported in your application.

- The possibility to store a GPS location together with a *ToDo Item*.

- A GPS location is optional. It should be possible to add and remove a location.

- Locations should work in combination with dates.

- A possibility to choose whether the notification should appear by entering or by exiting.

- Display a notification when a location is in the proximity (e.g. a 100 meter radius).

- Implement two ways to specify locations:

    - By addresses deposited in the phone contacts,
    - By specifying points (locations) in *Google Maps*.

Note: To use the *Google Maps MapView* you must first obtain an API key for your application. Please follow the instruction in the following link: https://developers.google.com/maps/documentation/android/

Second, implement an *ContentProvider* that provides your app data to other applications. In particular, other applications should get the possibility to iterate (read access) over *all* ToDo Items and to access there data.

Third, implement a second application (*ToDo Map*) which shows a map that contains a marker for each *open ToDo Item* with a location. Each marker has to show the title of the item. The ToDo Map application has to be separated from the *Todo Manager* application and it should use the *ContentProvider* to iterate over ToDo items.

LocationManager   You can use the *LocationManager* to keep track of locations and to know when he is close to one of the locations linked to a *To-Do Item*.

Contacts   Use the contacts to get addresses for To-Do Items. You can use the *Geocoding* feature to convert addresses to locations.

Google Maps   Take use of Google Maps to specify various locations in a map.

Geocoding   You can use this feature alongside with the Google Maps *MapView* API in order to transform addresses to longitude and latitude and vice-versa.

Submission

Deadline   The submission deadline is **11.01.2016, 12:00 (noon)**. Late submissions will not be accepted.

Project   Create an *Android Studio Project* (e.g. **exercise5**) for each exercise. Use **androidlab.⟨user⟩.exercise5** as package name. Make sure that your project include all source files.

Report   Your solution will consist of a *pdf file* ⟨**user**⟩**_report5.pdf** with a description. The description must be limited to one page per exercise. Submitting more than one page will lead to reduction in points. The description may be either in German or in English. Clear and understandable style is required.

Submission   Submit your solution to the subversion repository. Your solution will consist of one *folder* (e.g. **exercise5**) for each exercise which include the project and the report.

You are strongly encouraged to test your solution. Provide your source code with comments to understand the intention. Clear and understandable style is required.