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## Android Smartphone Programming

<http://proglang.informatik.uni-freiburg.de/teaching/androidpracticum/2014/>

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### Exercise Sheet 5

## 1 GPS Notification (20 points)

In this exercise you will extend the *To-Do List Manager* from the previous exercise sheet. *Alternatively you may choose 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* 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.
- 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 own *ContentProvider* that provides your app data to other applications. In particular, other applications should get the possibility to iterate (read access) over *ToDo Items* and to access there data.

Third, implement a second application (*ToDo Map*) which shows a map that contains a marker for each *ToDo Item* with a location. 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 **13.01.2015, 12:00 (noon)**. Late submissions will not be accepted.

**Project** Create an *Eclipse Project (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 (exercise5)* for each exercise which include the eclipse 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.