

UDel CISC 861

Fall 2013

UD Campus Tour: Part 2

1 Navigation on UD Map

In this assignment, you will design and develop an *interactive* Android app that navigates across UD campus by using the GPS sensor of a smartphone and the Google Maps. The objective is to provide directions from a current location (of the smartphone) to a particular building (specified by the user of the smartphone) across the UD campus.

2 Specific Tasks

In the assignment, you will complete the following tasks.

- Use the files `UDBuildingPositions` and `UDBuildingAdjMatrix` to create 53 buildings across the UD campus and setup their *adjacency* relationships. A *graph* (V, E) is used to model the adjacency relationships between buildings, where the *node* set V denotes the set of all the buildings and the *edge* set E denotes the adjacency relationships. Notice that `UDBuildingAdjMatrix` represents a 53 by 53 matrix, where a “1” in $[i, j]$ represent the edge (i, j) in E , denoting building i and building j are adjacent with each other.
- Compute a *shortest path* from the current location of the user of a smartphone to the destination building (4-letter building code) given by the user. The source location of the user is to be determined by using the GPS sensor of the smartphone and a path to the destination location is to be computed by using the adjacency matrix. You may reuse any Java code that computes shortest paths from an adjacency matrix.
- Provide **interactive** directions using the GPS sensor to travel from a source location to the destination building. While displaying visual directions, make sure to update the current location and display the path covered. A path is formed by direct lines between hops (*e.g.*, in a path $A \rightarrow B \rightarrow C \rightarrow D$, lines from A to B, from B to C and from C to D). You may assume a constant distance from GPS coordinates of a building to specify building’s vicinity (irrespective of the building’s shape or its distance from other buildings).

3 Development Tips

You may adopt the following tips to develop your application.

- Create a folder named 'raw' in the 'res' directory of your Android project directory.
- Place files `UDBuildingPositions` and `UDBuildingAdjMatrix` into that directory (e.g., `projectDir/res/raw/`).
- These files can be directly referred in Java code as `R.raw.UDBuildingAdjMatrix` and can be read by creating an `InputStream`. For instance, `(InputStream) context.getResources().openRawResource(R.raw.UDBuildingAdjMatrix)`.

4 Programming Resources

- [Google Maps Android API v2](#)
- [Google Maps Android API v2 - Tutorial](#)
- [Location and Maps in Android](#)
- [Android working with Google Maps V2](#)
- [Using Android's Dalvik Debug Monitor Server \(DDMS\)](#)

5 Submission

Via Sakai.