

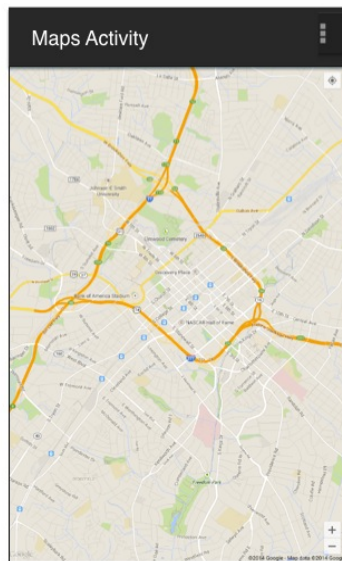
ITIS/ITCS 4180/5180 Mobile Application Development
Final Exam

Basic Instructions:

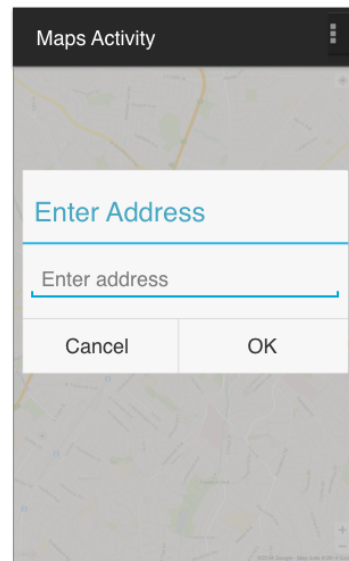
1. This is the Final Exam, which will count for 20% of the total course grade.
2. In every file submitted you **MUST** place the following comments:
 - a. Your Full Name.
3. This Final exam is an individual effort. Each student is responsible for her/his own Final and its submission.
4. Once you have picked up the exam, you may not discuss it in any way with anyone until the exam period is over.
5. During the exam, you are allowed to use the course videos, slides, and your code from previous homeworks and in class assignments. You are **NOT** allowed to use code provided by other students or from other sources.
6. Answer all the exam parts, all the parts are required.
7. Please download the support files provided with the Final and use them when implementing your project.
8. Your assignment will be graded for functional requirements and efficiency of your submitted solution. You will lose points if your code is not efficient, does unnecessary processing or blocks the UI thread.
9. Export your Android project and create a zip file which includes all the project folder and any required libraries. The file name is very important and should follow the following format: **Final.zip**
- 10. Failure to do the above instructions will result in loss of points.**
- 11. Any violation of the rules regarding consultation with others will not be tolerated and will result disciplinary action and failing the course.**

Final Exam (100 Points)

In this assignment you will develop a Maps application to save your favorite places. The App enables you to search for locations using an address or place name and then creates a marker for the place using LatLng returned from Geocoding. The App also enables users to save the locations into Firebase.



(a) Google Map Object



(b) Alert dialog to enter address

Figure 1: Maps Activity

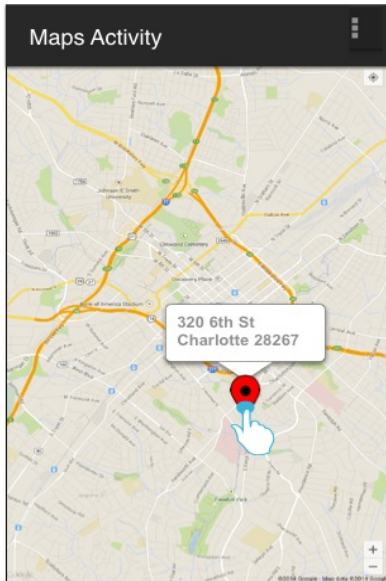
Maps Activity (100 points):

The Maps activity is used to search for a place with an address entered by the user and mark the place in the map. The user should be able to save and retrieve those places.

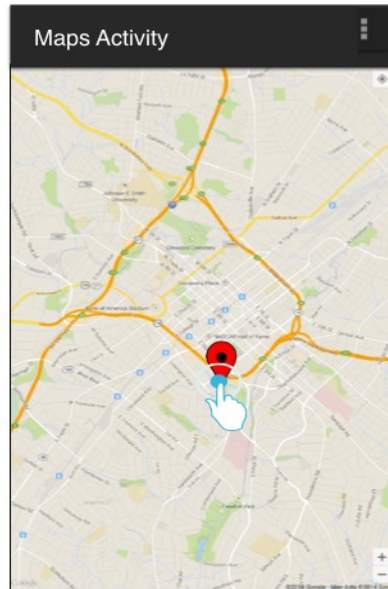
The app should implement the following functionality:

1. Once the user opens the application, the app should display a map view and a custom alert dialog with text box to enter the address and buttons "OK" and "Cancel" as shown in the Figure 1(a) and (b).
2. On Clicking "Cancel", dismiss the alert dialog without doing any functionality.
3. On Clicking "OK" the user input address in the text box should be checked for any null or blank values.
4. If valid, get the list of addresses returned for the given location using Geocoder.
 - a. Note that Geocoding should not be done in the main thread. Please use either AsyncTask or Threads to do this.
5. If Geocoder returns null, or a list addresses with size zero, then show a toast message that "Invalid address entered" as shown in Figure 2(e).
6. If Geocoder returns a list of addresses, then use only the first address, and given its provided latitude/longitude, display a RED marker on the map for that location.
 - Clicking on the marker should display an InfoWindow with the address of that location as shown in the Figure 2(a).

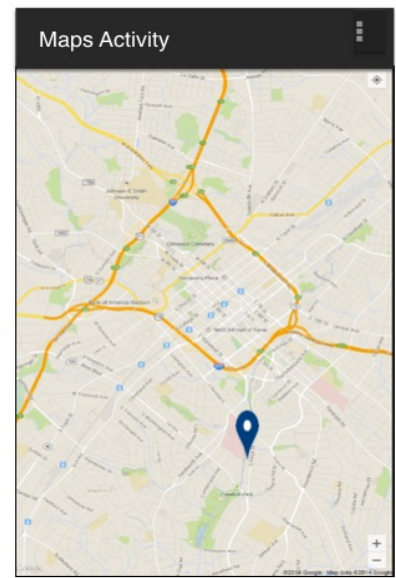
- Long clicking the marker should do the following:
 - If the marker has not been saved before:
 - save the location as a favorite place to Firebase, see Fig. 2(b).
 - change the color of the marker to BLUE as shown in Fig. 2(c).
 - If the marker is already saved as a Favorite place then just delete the marker from the map and the database.



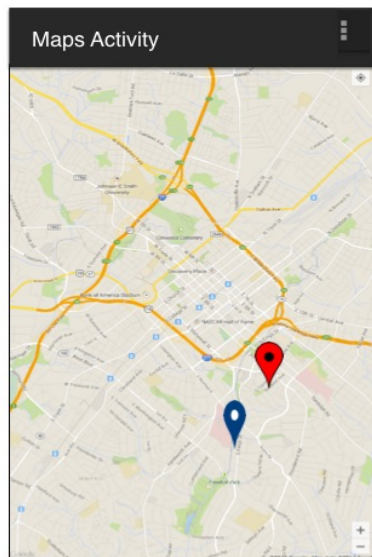
(a) Show info window when marker is clicked



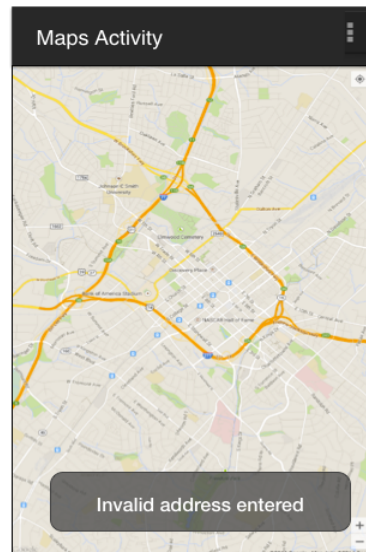
(b) On long click save the location as favorite



(c) Change the color of the marker that has been saved



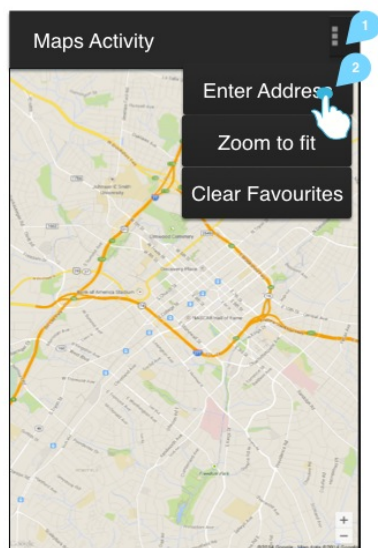
(d) Fix the saved marker on the map though user enter new location



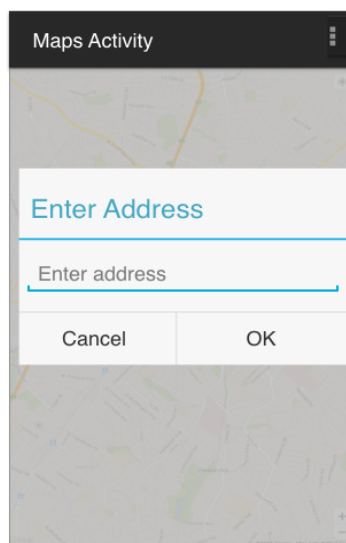
(e) Show toast if no place found for entered address

Figure 2: Maps Activity Walkthrough

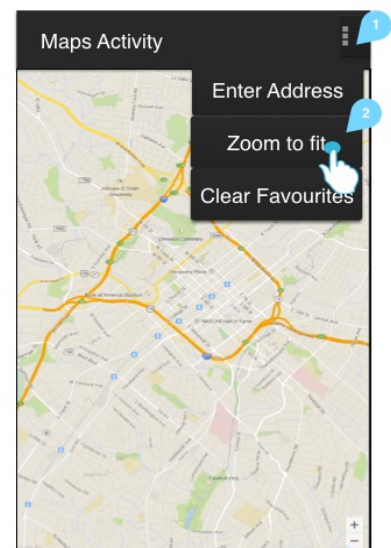
7. Blue Markers are persistent in the Map. Meaning that all the saved markers should remain displayed on the map unless the user clicks “Clear Favorites”
8. Red Markers are not persistent, meaning that only the recent location marker is displayed. i.e. If a user entered location A, then location B, the marker of location A disappears on the Map and only the latest (B) marker is displayed.
9. The activity should have three menu items:
 - Enter Address: On selecting this menu item, the custom alert dialog should be shown again, see Figure 3(b), repeating same logic in steps 1-6
 - Zoom to fit: On selecting this menu item, the map should be resized/zoomed out to show all the favorite markers in the view.
 - Clear Favorites: On selecting this menu item, all the fixed markers will be removed from the map, and all places saved in Firebase cleared.



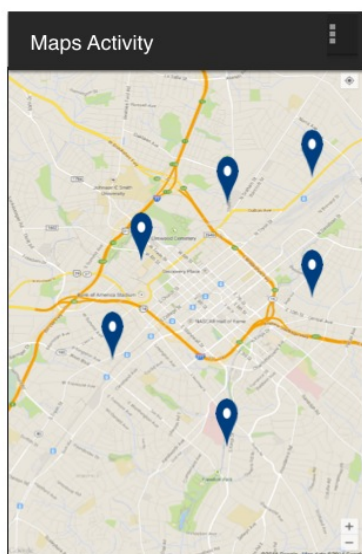
(a) Menu item to enter address



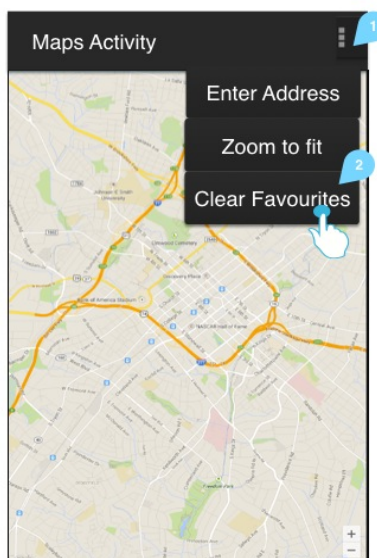
(b) Alert dialog to enter the address



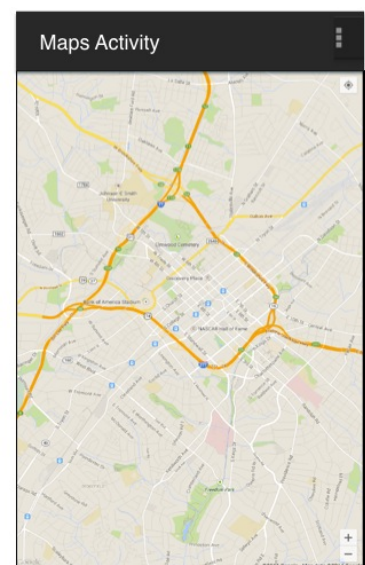
(c) Menu item zoom to fit



(d) Resize the map to show all the fixed markers



(e) Menu item to Clear favorites



(f) Clear all saved

Figure 3: Menu Items