ITIS/ITCS 4180/5180 Mobile Application Development
Final Exam
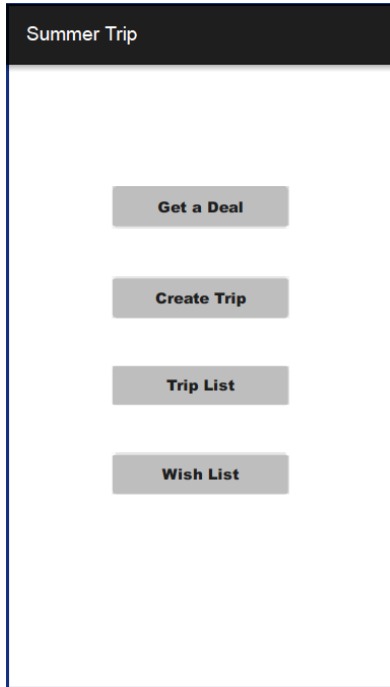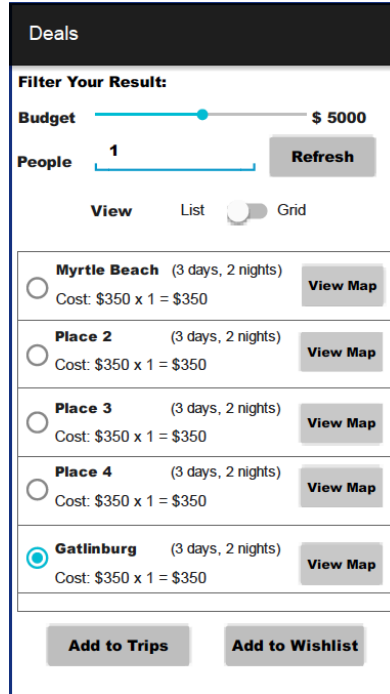
Basic Instructions:

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. **Do not Edit/Remove any of the comments generated by the IDE. Just add new lines. If Edited/Removed, you will get a zero.**
3. This is an individual effort. Each student is responsible for her/his own assignment 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 home works 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 loose 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: **800#_Final.zip.** Submit the exported file using the provided canvas submission link.
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.**
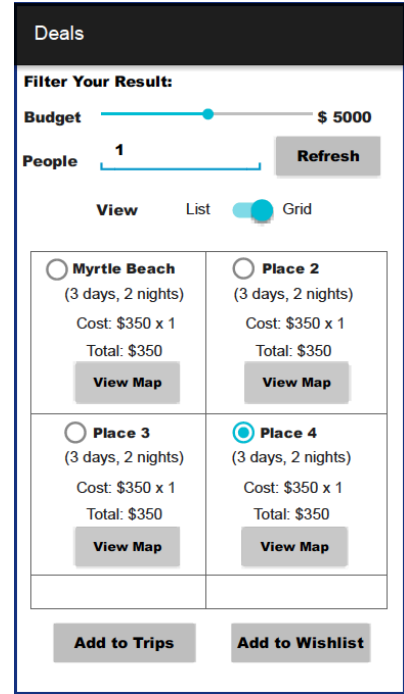
Final (100 points)

In this assignment, you will be building a Summer Trip planner application. Please see the screen shots.
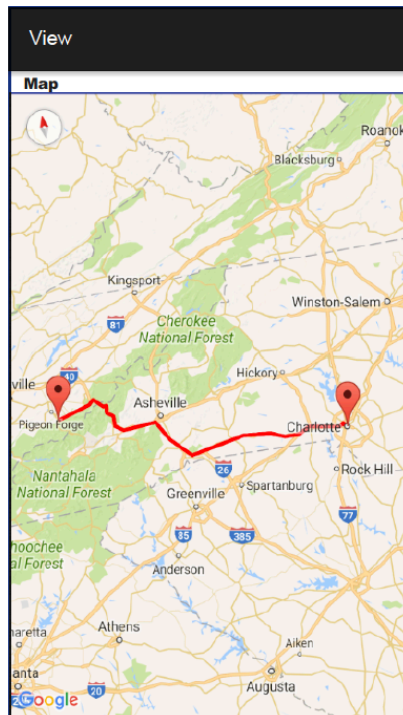

(a) Main Screen
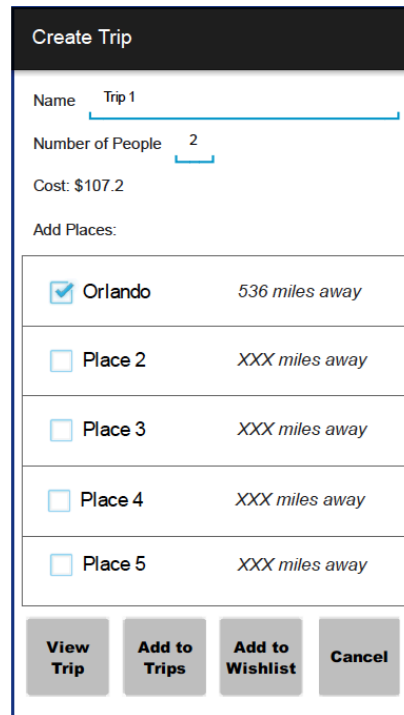

(b) Get a Deal Screen
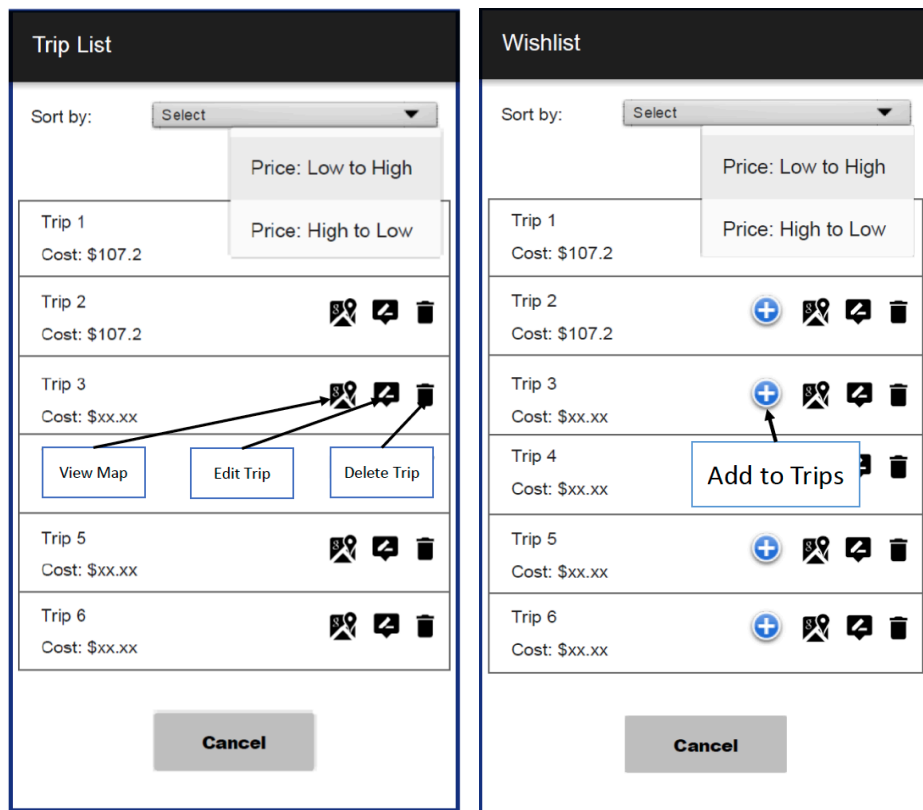

(c) Grid View of Deals

(d) View Map

(e) Create Trip Screen

(f) Trip List Screen   (g) WishList Screen

Figure 1: Wireframes of the Application

Setup:
1. Implement Sign in and Sign Up Functionalities (Basic is Required).
2. Upload JSON file to Firebase:
   - Download Resources.zip, extract it, and find the JSON file from there.
   - Create a New Application in Firebase. Import the JSON file to the project. This will be your database to read and use.
   - Firebase contains two types of elements:
     - Deals
       - Cost
       - Duraton
       - Location: Lat & Lon
       - Place
     - Places
       - City
       - Location: Lat & Lon
3. Setup Firebase to store data for the app.

Screens and Functionalities:
Use Activities or Fragments to implement the screens.
1. Main screen: Includes 4 buttons:
   a. Get a Deal: Clicking on this button will take the user to Deals screen, see Figure 1(b).

b. Create Trip: Clicking on this button will take the user to Create Trip screen, see Figure 1(e).
c. Trip List: Clicking on this button will take the user to the Trip List screen, see Figure 1(f).
d. Wish List: Clicking on this button will take the user to the Wishlist screen, see Figure 1(g).

2. Deals screen: This screen displays the list of deals provided in the Firebase database.
   a. Filters: The user can set the budget from USD 0 to USD 10,000 using a SeekBar. The user can set how many people will join in the trip. This Input must only take Positive Integers > 0.
   b. Refresh button: Refresh button should apply the filters to the Deals list.
   c. List of Deals: It should be a RecyclerView. Above the list of Deals, there should be a switch. Turning the switch OFF means, you should display the list in a Linear Layout. Turning the switch ON means, the list should be displayed in a Grid Layout.
   d. Each element in the list: Each element contains (Figure 1, b & c):
      i. Radio button to select the deal.
      ii. Place
      iii. Duration
      iv. Cost: **cost in database x number of people**.
      v. View Map button: Clicking on the View Map button should take the user to a Google Map screen. The screen displays the route to go from Charlotte to the Place in the deal. The Lat & Lon for Charlotte is: 35.307748, -80.733423. For example, in Figure 1(d), the user wanted to View the Map from Charlotte to Gatlinburg, TN.
   e. Add to Trips & Add to Wishlist: these two buttons are for adding the selected Deal to the user's Trips and Wishlist lists respectively.

3. Create Trip screen: Apart from the deals, a user can create his/her own trip using the list of places in the database.
   a. Name: takes input the name of the trip.
   b. Number of people: user can decide how many people will join in the trip.
   c. Cost: dynamically calculated, the default is 0.
   d. **Cost calculation:**
      i. Find the distance from Charlotte to a selected place in miles using distanceTo(), or distanceBetween() [if using Google Map API] functions.
      ii. For each mile add USD 0.2 as the average cost per person.
      iii. Formula to calculate cost for each place: **(distance from Charlotte in miles x 0.2 x number of persons)**.
      iv. Add the costs of all selected places and display it in cost.
   e. List of Places: list retrieved from the database. Each element has a CheckBox, Name of the Place and calculated Distance from Charlotte.
   f. Four buttons:
      i. View Trip: It will open a screen with google map, displaying the roundtrip route for the selected places. For example, if the user selects two places,

such as Asheville and Gatlinburg, the route should display: Charlotte -> Asheville -> Gatlinburg -> Charlotte.

  ii. Add to Trips: Clicking on the button should add the created trip to the Trips list.

  iii. Add to Wishlist: Clicking on the button should add the created trip to the Wishlist.

  iv. Cancel: Cancel button returns the user to the main screen.

4. Trip List and Wishlist screen:
   a. Sort DropDown options: Price Low to Higher and, Price High to Low.
   b. Each element has the Trip Name, Cost, and three icons- map, edit, delete.
   c. Each element in Wishlist has an extra button: add to trips, see figures 1(f, and g).
   d. Map icon should display the roundtrip for the trip.
   e. The user should be able to edit the trip.
   f. The user should be able to delete the trip.
   g. The user should be able to add a trip to the Trips list from the Wish list.

5. Toasts:
   a. For adding to and deleting from Trips and Wishlist.
   b. Switching between List Layout and Grid Layout.
   c. Refreshing the list in the Deals screen.
   d. Updating any item in Trip list and Wishlist.

Rubrics:

GUI + Sign In/Sign Up	10 points
Uploading JSON	2 points
Firebase Setup	10 points
RecyclerView	13 points
Layout Switch	5 points
Get a Deal Screen Functions	10
View Maps (3 screens)	15
Create Trip Screen Functions	10
Trip List Functions	10
Wishlist Functions	10
Toasts	5
Total	**100 points**