Mobile App Engineering and User Experience - Fall 2017
3rd Assignment – My Daily Path Report
Zhongze Tang i@tbis.me

Summary
As an undergraduate student, I achieve all the requirements. And I believe my assignment points will be in the range of 100 points maximum.

Details

- **Database** User checks in at a location, and a checkin associated with the lcaotion will be added to the database. If the location doesn't exist, a new location will be added. So, there are two tables, *checkin* and *location*. The checkin table stores all the check-ins, including their _id, longitude, latitude, time and location_id. The location table stores all the locations including their _id, longitude, latitude, name and address. The check-ins are associated with locations by location_id. I use *UNION* statements to inquire the name and address of a check-in.
- **Check-in** When the user clicks the purple check-in button, or whenever 5 minutes have passed, or when the user moves more than 100 meters, a check-in will be added. If the user checks in at this location first time (the check-in is not within a radius of 30m of an existing location), a new location and check-in record will be added to the database. Or, only a new check-in record will be added and its location_id will be the _id of the location found. All auto check-ins will be named as "Auto Checkins".
- **Google Map** Only locations will be shown as markers on the map. When user clicks on the map, a draggable marker will be added on it. It won't be saved unless the user clicks the marker again and enter the name of it. If the user enters more than one location's 30m circle, only one info window will pop up.
- **GeoFence** I do not use the GeoFence API of Google Maps API. I traverse all the locations to find if the user is in a 30m circle of a location or not.
- **Service** The service won't work unless it get the permission. I use an AlarmManager to set a timer. And I use an accumulator to check whether the user has moved 100m or not. When the location updates, I will calculate how far the user moves, and add it to the accumulator. A checkin will be added when it is greater than 100, and it will be set to 0. Then the service will send a broadcast to notify the main activity to update its listview.
- **Race Conditions** I do not think there will be race conditions in the APP. It will not happen that two or more threads try to modify the same variable at the same time.
- **UI** Add animations to the floating action buttons.

IMPORTANT Notes:

- I often cannot get the current address when I am using 3G network (I cannot use 4G). So, the address of the location in that case will be "Sorry, the service is not available."
- The accuracy of the GPS is too low. The location of the device may "teleport" sometimes. This will cause the unexpected locations, checkins and markers.
- The APP runs properly on Oneplus One (Android 7.1.2). When using virtual devices, there may be some problems because we have to send the location data manually.