Final Project Report

My project name is called convenient parking. It is about finding parking lots based on current user's location on a Google map. It helps people in Boston downtown to find parking Lot quickly and compare each parking Lot rate policy to acquire a satisfactory place to park there car. Because in downtown, there are too many cars and many road sides parking place are full. It will cost much time to find a proper place to park. And even if users find a place, it may charge a user too much, this is also inconvenient. In order to solve those inconvenience, I developed this app. So for a driver, my app is convenient to get nearby parking lot and information about all nearby parking lots. Users can compare rate of each parking lot and choose one to head to, And this app can also users to hold the parking lot information which users finally park so that users can find their parked position quickly. Thus this app will help people who drive in downtown Boston save much time on parking. I think Google map app also has some similar function, but my app is simple and more straightforward.

This app mainly use Google map show to users. It can be used in both smartphone and tablet. It provide users with a Google map, and three buttons and one textview, one is on the top right of screen, it is location button for locating users' current location. Two buttons are under Google map called "nearby parking" and "parked here" respectively. The Google map will show users a map with user's current location, marked with blue arrow after users click on that location button, and camera will move to current location. The other two buttons served for parking lot. The button called "nearby parking " is to get all nearby parking lot based on users' current location with markers on map when users click on this button. When all markers appear, users can click on those markers. On the top of those markers
will show each parking lot corresponding name information. These information windows can also be clickable. When users click on name windows, under "nearby parking" button, it will show specific parking lot information on the textview, such as name, address, and rate. It will help users to decide which parking lot they should go, and which one is cheaper. For button "parking here", when users click on this button, it will remove all makers on the map and add another customized car image
marker on map. This told users that their car parked here. Users click on the only marker will have "parked here" information as marker's title. The information window can also be clickable. When users click on information window, textview will show prompt message to remind users where their car parked.

My project for java has three files, one for store parking lot information, one for parking lot bean class to hold or get parking lot object, one for mainactivity. The Google map is as a fragment I add into main layout file with API key insider manifest file. For Locating users' current location, I add and permission into manifest file first, and I use fusedLocationProviderClient Google API to automatically choose location provider, provide the latest and most accurate location and configure the update

interval to get current location. And I implement OnMyLocationButtonClickListener and OnMyLocationClickListener, so a dot button will show on the top right on map. When click that button, camera will move to current location. As figure 1.
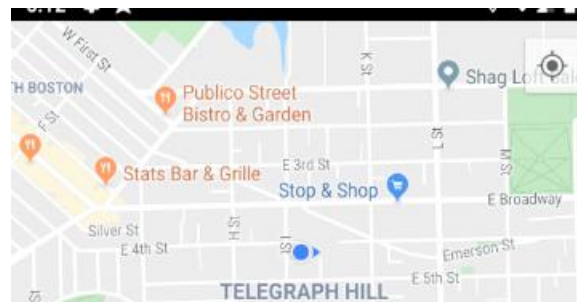

Figure 1

For parking lot data, I use sqlite database to create parking lot table hold all parking lot information about name, address, latitude, longitude and rate of all parking lot. In mainactivity, inside on create method, I insert all parking lot data into table. For "nearby parking" button, I use onclick attribute to make it clickable and bind showParkingLot method. This method will get a linkedlist that contains all nearby object returned from DBHelper method getParkingLot. The method getParkingLot will receive a location object as parameter and query database with a limited longitude and latitude range to get nearby parking lot information. showParkingLot method received that information, then base on latitude and longitude to add corresponding markers on map. When user click on one of those markers, it will show the name of that parking lot, show as Figure 2.

Figure 2

Also I add setOnInfoWindowClickListener on map, so when name of markers is clicked by users, it will trigger getparkLot method, this method will query parking lot table to get that one parking lot object whose query condition is parking lot name.

Then it will use textview to show that parking lot information use some get method which are defined in parkingLot bean class. Show as figure 3.

Figure 3

Under above situation, users want to park that parking lot , users can click park here button, then it will trigger parkHere method. It will remove all markers showed on map before, then add a new customized car image marker on that particular parking lot to help users remember where they park their car. What's more, when users click marker and its title ,it will appear corresponding text message. It's useful for a newer. Show as Figure 4
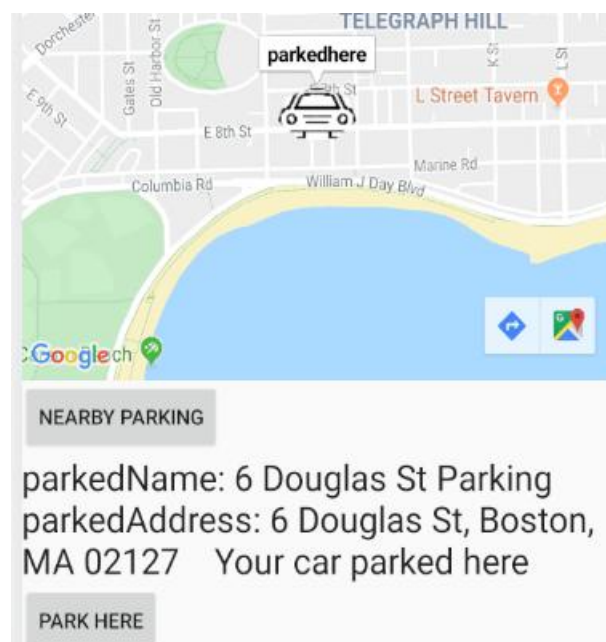

Figure 4

So I use content provider, activity and location to form my app.

When run this application, first database table will be created and data will be inserted into table. Click location dot button to focus on current location, then click "nearby parking" button to acquire nearby parking lot, retrieve data from database , and show as markers on map. Then click markers show names of markers, click those names, information about parking lot will appear. Then click "park here" button, it will show a special maker on map. And click marker and its name, prompt message will show on textview. I test my app by changing my location to acquire different parking lot. It's useful for users under different location. But some data is not adequate, so I add more data. Some errors I meet, query database fail, cannot require location, and some logic errors. I solve them by one by one step check and run the app.

Actually, when I finish this project, I feel like I master more Android knowledge and more different components how to interact with each other. For this project, I wanna to improve is that the parking lot information data, I insert those data by myself, I think I should use some API to get those data from web source. It will be better and simper to get more information.