**Introduction:**

The ZipBike android app, is an app designed using the Biketown API, to make various information about the Biketown and their bikes available to the users at the click of a button.

**Biketown:**

Biketown is a bike sharing system in Oregon. It has around 100 hubs (Bike stations) with more than 1000 bikes across Portland, primarily in downtown area. It is growing by the day by providing its users a quick and easy way to commute in and around Portland.

Commuters can take a bike from a hub and return it to the same or any other hub. They offer hourly, monthly, yearly passes.

*More information here:* [*https://www.biketownpdx.com/*](https://www.biketownpdx.com/)

**App Features:**

The app provides its users the 4 nearest bike stations based on their current location. Users can then get the route to the bike hub on google maps. The also provides information about the pricing plans offered by Biketown. The user can then ride the bike using the link to the website provided by our app. The user can also get the number of available bikes at a bike station by searching the station name in our list of bike stations.

Our app is working for both landscape and portrait mode.

**Software Used:**

Android Studio 2.3

**Android features implemented:**

GPS, Internet, Min SDK: 21, Min OS: Android 5.0 Lollipop

**Tested on:**

Moto E, OnePlus One

1. **Splash Activity:**

This is the entry point for our application. In this activity JSON objects and arrays are parsed from the web URLs and passed to the menu activity. The current location is also obtained in this activity. The parsing of the data from the API, is done in asyntask on a separate thread as it prevents freezing of the UI and main thread.

JSON parsing is done from below URLs:

<http://biketownpdx.socialbicycles.com/opendata/system_pricing_plans.json>

<http://biketownpdx.socialbicycles.com/opendata/station_information.json>

<http://biketownpdx.socialbicycles.com/opendata/station_status.json>

1. **Menu Activity:**

In this activity, the json data passed as intent is received.

Three image buttons are implemented and a listener is assigned to each button. This activity waits for button click and next activity is started according to the button pressed. User can select any one of three buttons namely, Pricing Plans, Find a Bike Station, Free Bikes by Station.

1. **Price Activity:**

In this activity JSON data about the pricing plans is received from the menu activity. This activity displays the plans available on the screen in the form of a list view. Users can click on a list view item and get information about that plan.

This activity implements a listener for the list view and starts the PlanActivity.

1. **Plan Activity:**

In this activity data about the specific plan is received from the price activity.

This activity then displays the plan information on the screen.

Users can click the “Ride” button which redirects them to the biketown payment url.

1. **HubID Activity:**

In this activity, the JSON data is received from menu activity.

A listview is implemented to display address of all bike hubs. Users can search for a hub by entering a string. We have used SearchView widget to accomplish this.

Clicking on a List view item opens the free bike activity which displays info about the station.

1. **FreeBike Activity:**

In this activity, the data about the hub is received from the hubid activty.

This activity displays the hub info such as the hub address and number of free bikes for that station on the screen.

1. **Location Activity:**

In this activity, the JSON data is received from menu activity.

It calculates the nearest four hubs present using the distanceto method.

It displays the hub addresses and distance and free bikes inforamtion and user can click on the show on map button to display the hubs on a map.

1. **Maps Activity:**

In this activity nearest hub marker and our current location is displayed on the map screen users can click on a marker and click on the route button which opens google maps app.

We have used google maps fragment and addmarker() method to display markers on the screen.

**Challenges Faced:**

1. JSON Parsing - There are bugs in the API like incorrect pricing information and incomplete addresses. We used geocoder to get the correct address to resolve this.

2. Location detection - The GPS does not function properly in some areas leading to inaccurate search results.

3. UI - Many iterations were done to get a best possible user experience.

4. Passing data between activities - We tried to pass a custom object to other activities but for some reason it did not work and so ended up passing arrays

**Conclusion and Future Scope:**

We have built an app to provide users data from BikeTown API in a organized manner.

Further improvements can be made in the UI and improve the search functionality to include multi keyword search.

**Work Distribution:**

**Rahul Kumar:** Search algorithm, Search widget integration, JSON Parsing, Documentation (LocationUpdateActivity, MapsActivtiy, Station Class, SplashActivity)

**Abhishek Tatke:** User Interface, Testing, Documentation (Menu Activity, Pricing Activity, PlanActivity, HubId Activity, FreeBike Activity)

**References:**

1) Android Programming BNRG – Bill Phillips, Brian Hardy

2) Stackoverflow.com – various small code snippets.

3) TutorialsPoint.com – Android Tutorial

4) http://blog.adron.me/articles/biketown-api/