CSC 491 Assignment 4	Author: Krishnan Mahadevan
	Date: 22 May 2017

1. Project Title

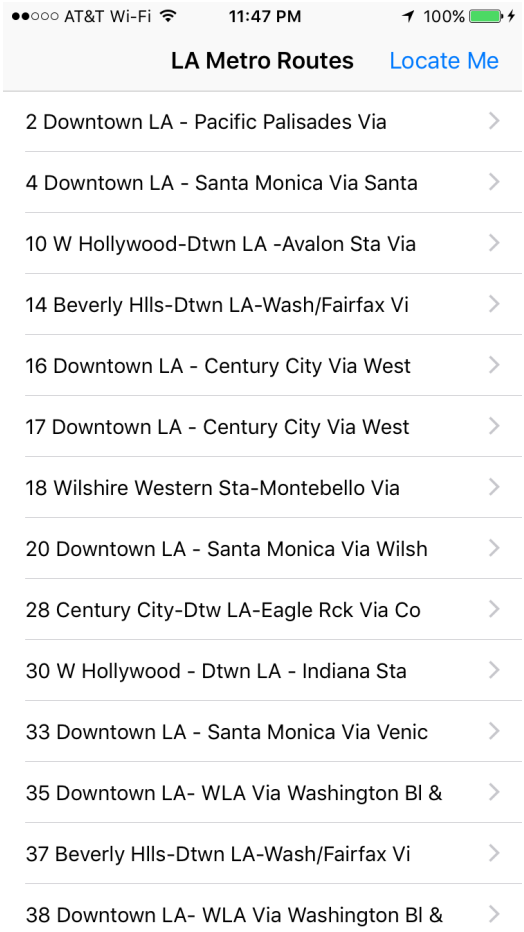
Assignment 4

2. Developer Name(s)

Krishnan Mahadevan

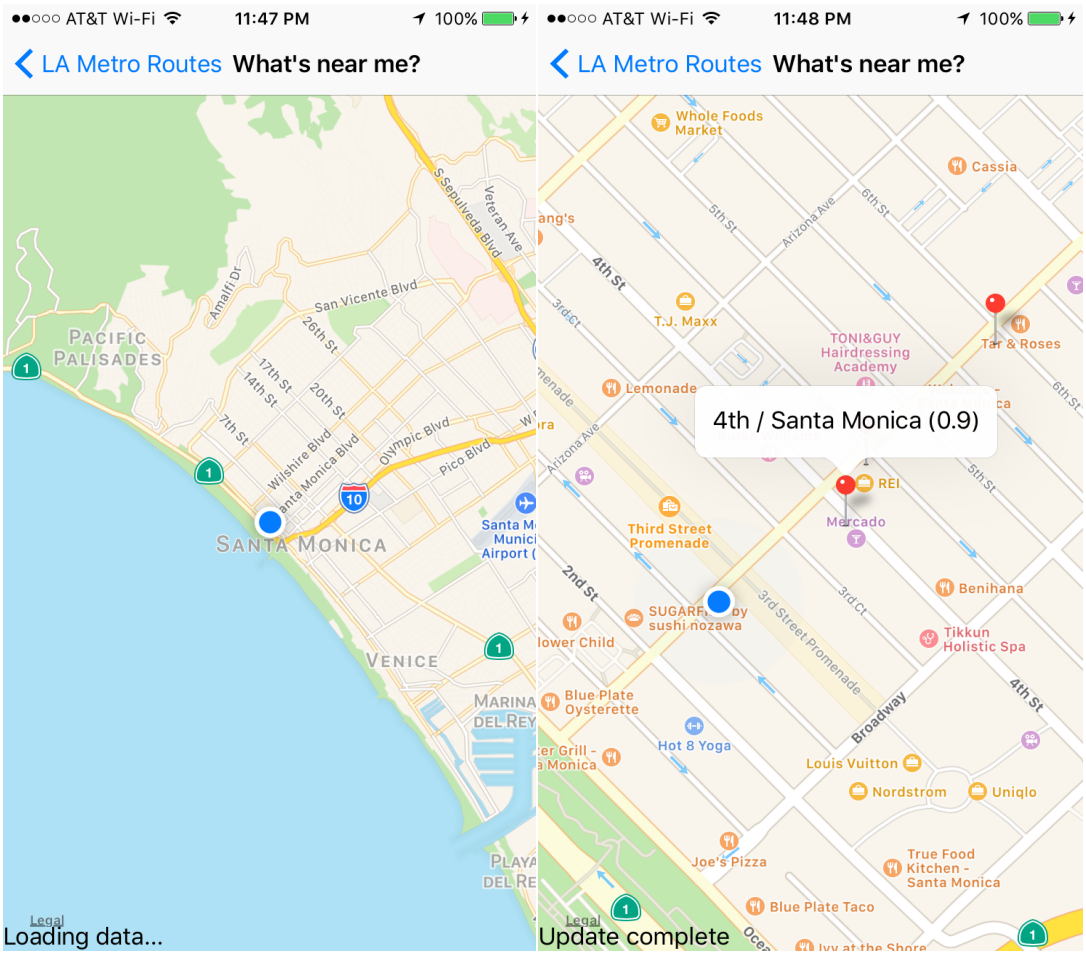
3. Project Description

Assignment 4 is an extension of assignment 2. For assignment 4 I add a new functionality to the LA Metro App called “Locate Me”. “Locate Me” offers real time data of the bus stops on the vicinity of the user. Users can reach this screen from the LA Metro Routes screen.



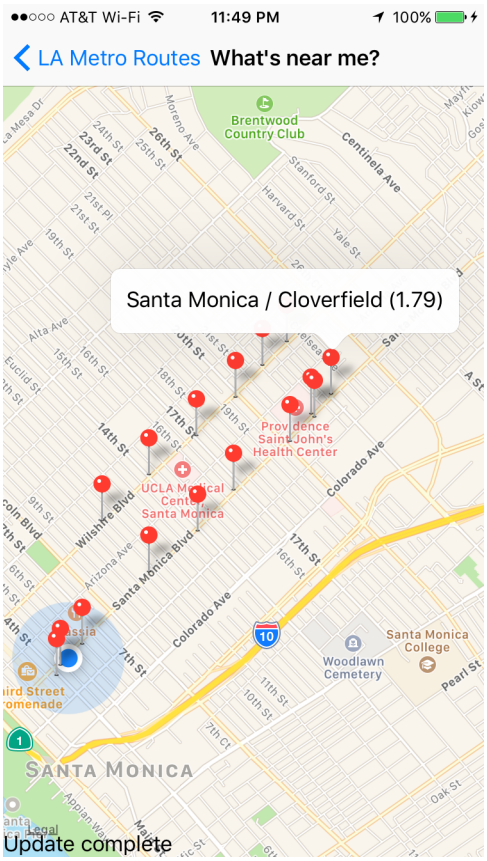
Locate Me is a data intensive screen. When this screen opens for the first time, the app loads all the available bus stops on the vicinity of the user from LA Metro API. On the initial load, users will see “Loading data” label on the bottom of the screen. On the subsequent loading of the screen the app picks up the bus stop information from the memory. This leads to tremendous improvement on the user experience. As during simulation from the .gpx file, the nearest bus stop information is loaded from phone memory instead of multiple network API calls.

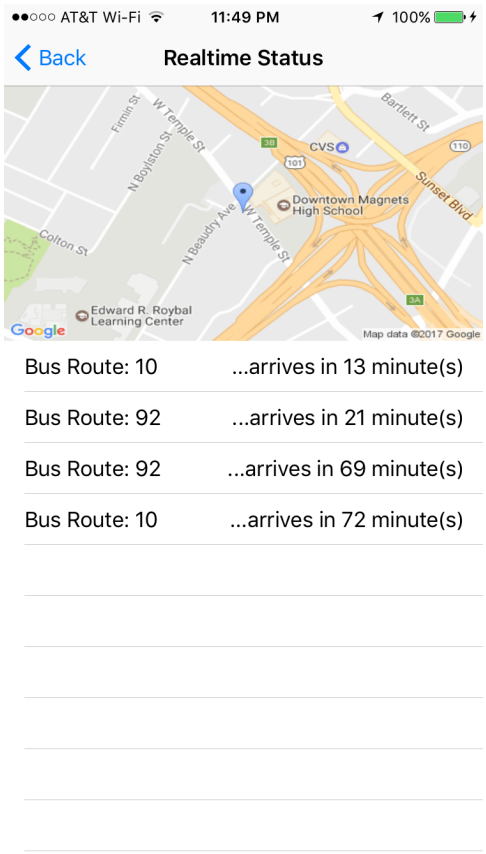
CSC 491 Assignment 4	Author: Krishnan Mahadevan
	Date: 22 May 2017



Upon clicking the annotations, it shows the bus stop name and the distance of the bus stop from the user. I would love to also show next the bus scheduled on the bus stop or the routes on the bus stop, but annotation being a very limited space, it was not feasible. I also tried putting it on the label below, but it didn't appear functional. To get real time update of buses on the bus stop user will have to go on a different screen. That screen was built as a part of assignment 2. To get to realtime status, user will have to go back to routes, click on route > click on bus stops on the routes > Real time status

At any given time, user can see at least 15 bus stop in the radius of 2 miles.





From the design perspective, the Core Location library is abstracted out into a Singleton class. This being a very expensive functionality to have, a Singleton class solves the purpose of having only one instance throughout the application.

The calculation of distance between the user's latitude and longitude and the available bus stops, is done using Haversine formula. The MetroService Class provides all the interaction of making API calls and fetching the data. The LocationSerivce class, exposes the protocol the access user's location. Errors while accessing Location is handled by simply printing it out in the output. The Location Service class has a delegate that facilitates the purpose.

While testing please note, the app takes a while to load the data from API. Once it's loaded all the subsequent operations are smooth and crisp. The project has an associated gpx file, that has a predefined route from Santa Monica to Culver City in Los Angeles.

There were a number of challenges encountered during the implementation of this assignment. The most difficult one to solve was how to access LA Metro records in real time to determine nearest bus stops in the user's vicinity. I took a while to figure it out. But given an opportunity, I would like to go back and relook the approach I took. The difficulty was mainly due to the non availability of an API to determine bus stops in the users vicinity. Hence I had to write a custom logic to determine distance on a radius of 2 miles of the users location.