Realtime Location Tracking

Problem Statement

The goal of this project is to understand how to use location tracking and Maps to build a realtime low-energy tracking application. The app only needs to work outdoors. However, here is the catch. The app should be low power consuming. Hence, it cannot just use GPS all the time to provide realtime location information to the user.

Layout: This application uses a Map Fragment.

Description:

The methods implemented in MainActivity are as shown below.

onCreate(): This method retrieves specific sensors, the Accelerometer, Location service and call fetch location function.

onStop(), onDestroy(), onPause(): These methods have been used to deregister the listeners for the accelerometer.

OnSensorChanged(): This method notices the sensor event and gets executed whenever there is change in any sensor, it is storing the floating-point values of accelerometer representing points on the x-axis, y-axis, and z-axis of the device’s coordinate system. I have used array list to store the sample values of the sensor.

onMapReady(): This method is used to set the marker on Google Maps and make any changes to the maps as I have added feature to zoom in to see the location.

Along with these methods, I have implemented few more methods.

Algorithm:

Applications can use the signals supplied by the device's numerous sensors to detect the device's position. Choosing the proper signal combination for a certain task under various settings, on the other hand, is not easy. It's much more difficult to find a solution that's also battery friendly. The fused location provider is a Google API that intelligently integrates several signals to offer the location data that your app requires. The fused location provider controls the underlying location technologies, such as GPS and Wi-Fi, and sensors to give us highly accurate location while consuming less power.

For the accelerometer sensor data is collected in array list named as listacc.

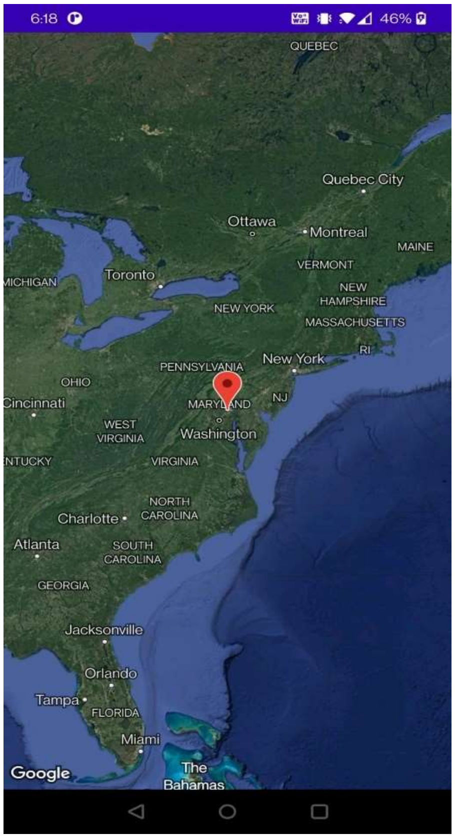
In fetchLocation() method first checks if the application has required permissions to access the location and then it creates a task that calls the getLastLocation() method of the fusedLocationProvider class which provides the current location of the device. If the task gets a location successfully, the onSuccess() method is executed and it initializes the map and the onMapReady() method is invoked that sets the marker at the received current location. I have added a feature to zoom in to see the current location clearly in onMapReady() method.

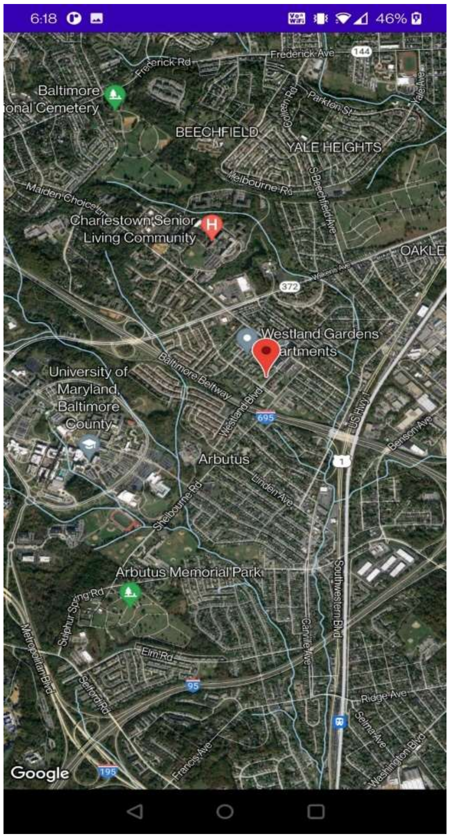
Using this method to get location allows to do so with minimum power requirement and with high accuracy.

Working:

This application works better on connected android device than the emulator. I would request you to test it on connected android device. Place your phone on table and launch the application. Google Maps will open once the application is launched and you will be able to see a location marker at your current location.

UI:




6:18
46%
Baltimore National Cemetery
BEECHFIELD
YALE HEIGHTS
Charlestown Senior Living Community
OAKLE
Westland Gardens Apartments
University of Maryland, Baltimore County
Arbutus
Arbutus Memorial Park
Google

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