Ex. No. 07 **Develop a native application that uses GPS location information**

Date:

Aim:

To develop an Android Application that uses GPS location information.

Procedure:

Creating a New project:

- Open Android Studio and then click on **File -> New -> New project**.
- Then type the Application name as **"exn07"**and click Next.
- Then **select the Minimum SDK** as shown below and click Next.
- Then **select the Empty Activity** and click Next.
- Finally click **Finish**.
- It will take some time to build and load the project.
- After completion it will look as given below.

Designing layout for the Android Application:

- Click on **app -> res -> layout -> activity_main.xml**.
- Now click on Text as shown below.
- Then delete the code which is there and type the code as given below.

Code for Activity_main.xml:

```
<?xml version = "1.0" encoding = "utf-8"?>
<LinearLayout xmlns:android = "http://schemas.android.com/apk/res/android"
  android:layout_width = "fill_parent"
  android:layout_height = "fill_parent"
  android:orientation = "vertical" >

<Button
    android:id = "@+id/button"
    android:layout_width = "fill_parent"
    android:layout_height = "wrap_content"
    android:text = "getlocation"/>

</LinearLayout>
```

- Now click on Design and your application will look as given below.
- So now the designing part is completed.

Following will be the content of res/values/strings.xml to define two new constants –

```
<?xml version = "1.0" encoding = "utf-8"?>
<resources>
<string name = "app_name">Tutorialspoint</string>
</resources>
```

Adding permissions in Manifest for the Android Application:

- Click on **app -> manifests -> AndroidManifest.xml.**

Code for AndroidManifest.xml:

```
<?xml version = "1.0" encoding = "utf-8"?>
<manifest xmlns:android = "http://schemas.android.com/apk/res/android"
  package = "com.example.tutorialspoint7.myapplication">
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-permission android:name = "android.permission.INTERNET" />
<application
    android:allowBackup = "true"
    android:icon = "@mipmap/ic_launcher"
    android:label = "@string/app_name"
    android:supportsRtl = "true"
    android:theme = "@style/AppTheme">

<activity android:name = ".MainActivity">
<intent-filter>
<action android:name = "android.intent.action.MAIN" />
<category android:name = "android.intent.category.LAUNCHER" />
</intent-filter>
</activity>
</application>

</manifest>
```

Java Coding for the Android Application:

- Click on **app -> java -> com.example.exno7 -> MainActivity**.
- Then delete the code which is there and type the code as given below.

Code for MainActivity.java:

```
packagecom.example.exno7;

import android.Manifest;
import android.app.Activity;
import android.os.Bundle;
import android.support.v4.app.ActivityCompat;
import android.test.mock.MockPackageManager;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends Activity {

  Button btnShowLocation;
  private static final int REQUEST_CODE_PERMISSION = 2;
  String mPermission = Manifest.permission.ACCESS_FINE_LOCATION;

  // GPSTracker class
  GPSTracker gps;

  @Override
  public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    try {
      if (ActivityCompat.checkSelfPermission(this, mPermission)
        != MockPackageManager.PERMISSION_GRANTED) {

        ActivityCompat.requestPermissions(this, new String[]{mPermission},
          REQUEST_CODE_PERMISSION);

        // If any permission above not allowed by user, this condition will
          execute every time, else your else part will work
      }
    } catch (Exception e) {
      e.printStackTrace();
    }

    btnShowLocation = (Button) findViewById(R.id.button);
    // show location button click event
    btnShowLocation.setOnClickListener(new View.OnClickListener() {

      @Override
      public void onClick(View argo) {
        // create class object
        gps = new GPSTracker(MainActivity.this);

        // check if GPS enabled
        if(gps.canGetLocation()){

          double latitude = gps.getLatitude();
          double longitude = gps.getLongitude();

          // \n is for new line
          Toast.makeText(getApplicationContext(), "Your Location is - \nLat: "
            + latitude + "\nLong: " + longitude, Toast.LENGTH_LONG).show();
        }else{
          // can't get location
          // GPS or Network is not enabled
          // Ask user to enable GPS/network in settings
          gps.showSettingsAlert();
        }

      }
    });
  }
}
```

- Following is the content of the modified main activity file **GPSTracker.java**.

Code for GPDTracker.Java

```
packagecom.example.exno7;
import android.app.AlertDialog;
import android.app.Service;
import android.content.Context;
import android.content.DialogInterface;
import android.content.Intent;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.os.Bundle;
import android.os.IBinder;
import android.provider.Settings;
import android.util.Log;
public class GPSTracker extends Service implements LocationListener {

  private final Context mContext;

  // flag for GPS status
  boolean isGPSEnabled = false;

  // flag for network status
  boolean isNetworkEnabled = false;

  // flag for GPS status
  boolean canGetLocation = false;

  Location location; // location
  double latitude; // latitude
  double longitude; // longitude

  // The minimum distance to change Updates in meters
  private static final long MIN_DISTANCE_CHANGE_FOR_UPDATES = 10; // 10 meters

  // The minimum time between updates in milliseconds
  private static final long MIN_TIME_BW_UPDATES = 1000 * 60 * 1; // 1 minute

  // Declaring a Location Manager
  protected LocationManager locationManager;

  public GPSTracker(Context context) {
    this.mContext = context;
    getLocation();
  }

  public Location getLocation() {
    try {
      locationManager = (LocationManager) mContext.getSystemService(LOCATION_SERVICE);

      // getting GPS status
      isGPSEnabled = locationManager.isProviderEnabled(LocationManager.GPS_PROVIDER);

      // getting network status
      isNetworkEnabled = locationManager
        .isProviderEnabled(LocationManager.NETWORK_PROVIDER);
```

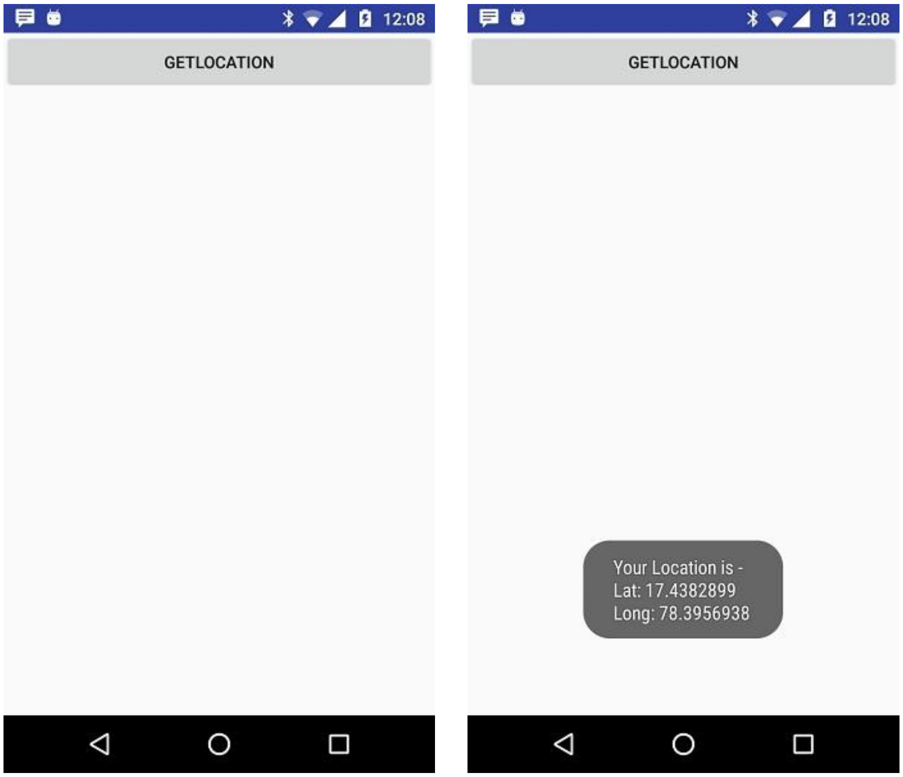
```
if (!isGPSEnabled && !isNetworkEnabled) {
  // no network provider is enabled
} else {
  this.canGetLocation = true;
  // First get location from Network Provider
  if (isNetworkEnabled) {
    locationManager.requestLocationUpdates(
      LocationManager.NETWORK_PROVIDER,
      MIN_TIME_BW_UPDATES,
      MIN_DISTANCE_CHANGE_FOR_UPDATES, this);

    Log.d("Network", "Network");
    if (locationManager != null) {
      location = locationManager
        .getLastKnownLocation(LocationManager.NETWORK_PROVIDER);

      if (location != null) {
        latitude = location.getLatitude();
        longitude = location.getLongitude();
      }
    }
  }

  // if GPS Enabled get lat/long using GPS Services
  if (isGPSEnabled) {
    if (location == null) {
      locationManager.requestLocationUpdates(
        LocationManager.GPS_PROVIDER,
        MIN_TIME_BW_UPDATES,
        MIN_DISTANCE_CHANGE_FOR_UPDATES, this);

      Log.d("GPS Enabled", "GPS Enabled");
      if (locationManager != null) {
        location = locationManager
          .getLastKnownLocation(LocationManager.GPS_PROVIDER);

        if (location != null) {
          latitude = location.getLatitude();
          longitude = location.getLongitude();
        }
      }
```

```
        }
      }
    }

  } catch (Exception e) {
    e.printStackTrace();
  }

  return location;
}

/**
  * Stop using GPS listener
  * Calling this function will stop using GPS in your app
* */

public void stopUsingGPS(){
  if(locationManager != null){
    locationManager.removeUpdates(GPSTracker.this);
  }
}

/**
  * Function to get latitude
* */

public double getLatitude(){
  if(location != null){
    latitude = location.getLatitude();
  }

  // return latitude
  return latitude;
}

/**
  * Function to get longitude
* */

public double getLongitude(){
  if(location != null){
    longitude = location.getLongitude();
  }

  // return longitude
  return longitude;
}

/**
  * Function to check GPS/wifi enabled
  * @return boolean
* */

public boolean canGetLocation() {
  return this.canGetLocation;
}

/**
  * Function to show settings alert dialog
  * On pressing Settings button will lauch Settings Options
* */

public void showSettingsAlert(){
  AlertDialog.Builder alertDialog = new AlertDialog.Builder(mContext);

  // Setting Dialog Title
  alertDialog.setTitle("GPS is settings");

  // Setting Dialog Message
  alertDialog.setMessage("GPS is not enabled. Do you want to go to settings menu?");

  // On pressing Settings button
  alertDialog.setPositiveButton("Settings", new DialogInterface.OnClickListener() {
    public void onClick(DialogInterface dialog,int which) {
      Intent intent = new Intent(Settings.ACTION_LOCATION_SOURCE_SETTINGS);
      mContext.startActivity(intent);
    }
  });

  // on pressing cancel button
  alertDialog.setNegativeButton("Cancel", new DialogInterface.OnClickListener() {
    public void onClick(DialogInterface dialog, int which) {
      dialog.cancel();
    }
```

```
      });

      // Showing Alert Message
      alertDialog.show();
    }

    @Override
    public void onLocationChanged(Location location) {
    }

    @Override
    public void onProviderDisabled(String provider) {
    }

    @Override
    public void onProviderEnabled(String provider) {
    }

    @Override
    public void onStatusChanged(String provider, int status, Bundle extras) {
    }

    @Override
    public IBinder onBind(Intent argo) {
      return null;
    }
  }
```

- So now the Coding part is also completed.
- Now run the application to see the output.

Output:



Your Location is -
Lat: 17.4382899
Long: 78.3956938

Result:

Thus Android Application that implements GPS Location Information is developed and executed successfully.