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 **“exno7”**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.

Designing layout for the Android Application:

- Click on **app -> res -> layout -> activity_main.xml**.

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>
```

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**.

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 arg0) {
        // 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();
    }
  }
```

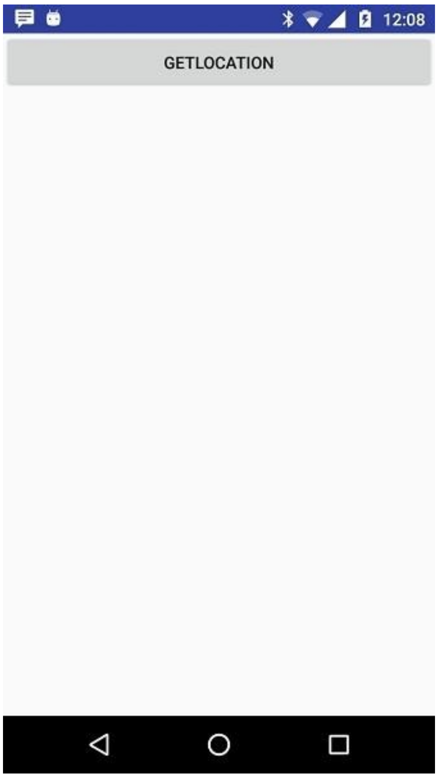
```
        }
      }
    }

  } 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
* */
```

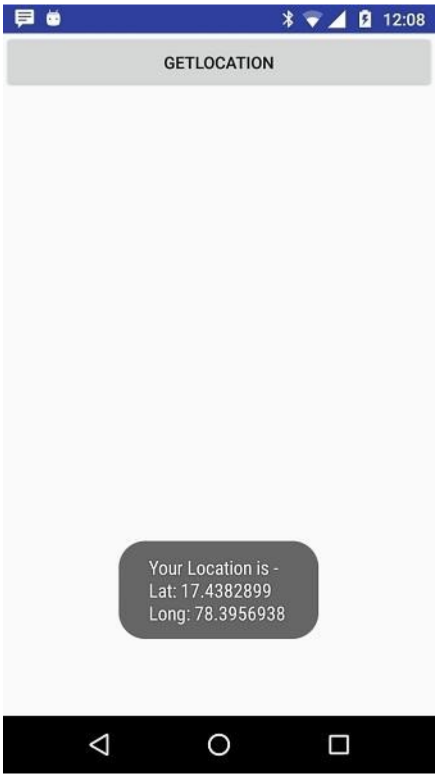
```
public double
  getLongitude(){if(location
  != null){
    longitude = location.getLongitude();
  }

  // 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
    arg0) {return null;
  }
}
```

- 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.