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| **Ex. No. 11 Develop a native application that uses GPS location information Date:12/03/25** |

**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.

∙ 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="match\_parent"**  
 **android:layout\_height="match\_parent"**  
 **android:orientation="vertical"**  
 **android:padding="20dp"**  
 **android:gravity="center">**  
  
 **<TextView**  
 **android:id="@+id/locationText"**  
 **android:layout\_width="wrap\_content"**  
 **android:layout\_height="wrap\_content"**  
 **android:text="Location will be displayed here"**  
 **android:textSize="18sp"**  
 **android:padding="10dp"/>**  
  
 **<Button**  
 **android:id="@+id/getLocationButton"**  
 **android:layout\_width="wrap\_content"**  
 **android:layout\_height="wrap\_content"**  
 **android:text="Get Location"**  
 **android:padding="10dp"**  
 **android:layout\_marginTop="20dp"/>**  
  
**</LinearLayout>**

**Following will be the content of res/values/themes.xml :**

**<resources xmlns:tools="http://schemas.android.com/tools">**  
 **<style name="Theme.LocationApp"**

**parent="Theme.MaterialComponents.DayNight.DarkActionBar">**  
 **<!-- Customize colors -->**  
 **<item name="colorPrimary">@color/purple\_500</item>**  
 **<item name="colorPrimaryVariant">@color/purple\_700</item>**  
 **<item name="colorOnPrimary">@color/white</item>**  
 **<item name="colorSecondary">@color/teal\_200</item>**  
 **<item name="colorOnSecondary">@color/black</item>**  
 **<item name="android:statusBarColor">@color/purple\_700</item>**  
 **<item name="android:navigationBarColor">@color/black</item>**  
 **</style>**  
**</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">  
  
 <!-- Permissions for GPS -->  
 <uses-permission android:name="android.permission.ACCESS\_FINE\_LOCATION"/>  
 <uses-permission android:name="android.permission.ACCESS\_COARSE\_LOCATION"/>  
  
 <uses-feature android:name="android.hardware.location.gps" />  
  
 <application  
 android:allowBackup="true"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="Location App"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/Theme.LocationApp">  
  
 <activity android:name=".MainActivity"  
 android:exported="true">  
 <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:**

**package com.example.exno11;**  
  
**import android.Manifest;**  
**import android.content.pm.PackageManager;**  
**import android.location.Location;**  
**import android.os.Bundle;**  
**import android.widget.Button;**  
**import android.widget.TextView;**  
**import android.widget.Toast;**  
**import androidx.annotation.NonNull;**  
**import androidx.appcompat.app.AppCompatActivity;**  
**import androidx.core.app.ActivityCompat;**  
  
**import com.google.android.gms.location.FusedLocationProviderClient;**  
**import com.google.android.gms.location.LocationServices;**  
**import com.google.android.gms.tasks.OnSuccessListener;**  
**import com.google.android.gms.tasks.Task;**  
  
**public class MainActivity extends AppCompatActivity {**  
  
 **private static final int LOCATION\_PERMISSION\_REQUEST\_CODE = 1;**  
 **private FusedLocationProviderClient fusedLocationProviderClient;**  
 **private TextView locationText;**  
 **private Button getLocationButton;**  
  
 **@Override**  
 **protected void onCreate(Bundle savedInstanceState) {**  
 **super.onCreate(savedInstanceState);**  
 **setContentView(R.layout.activity\_main);**  
  
 **locationText = findViewById(R.id.locationText);**  
 **getLocationButton = findViewById(R.id.getLocationButton);**  
  
 **// Initialize FusedLocationProviderClient**  
 **fusedLocationProviderClient = LocationServices.getFusedLocationProviderClient(this);**  
  
 **getLocationButton.setOnClickListener(v -> getLocation());**  
 **}**  
  
 **private void getLocation() {**  
 **// Check for permission**  
 **if (ActivityCompat.checkSelfPermission(this, Manifest.permission.ACCESS\_FINE\_LOCATION)**  
 **!= PackageManager.PERMISSION\_GRANTED &&**  
 **ActivityCompat.checkSelfPermission(this, Manifest.permission.ACCESS\_COARSE\_LOCATION)**  
 **!= PackageManager.PERMISSION\_GRANTED) {**  
  
 **// Request permission**  
 **ActivityCompat.requestPermissions(this,**  
 **new String[]{Manifest.permission.ACCESS\_FINE\_LOCATION, Manifest.permission.ACCESS\_COARSE\_LOCATION},**  
 **LOCATION\_PERMISSION\_REQUEST\_CODE);**  
 **return;**  
 **}**  
  
 **// Get last known location**  
 **Task<Location> task = fusedLocationProviderClient.getLastLocation();**  
 **task.addOnSuccessListener(new OnSuccessListener<Location>() {**  
 **@Override**  
 **public void onSuccess(Location location) {**  
 **if (location != null) {**  
 **double latitude = location.getLatitude();**  
 **double longitude = location.getLongitude();**  
 **locationText.setText("Latitude: " + latitude + "\nLongitude: " + longitude);**  
 **} else {**  
 **locationText.setText("Location not available");**  
 **}**  
 **}**  
 **});**  
 **}**  
  
 **// Handle permission result**  
 **@Override**  
 **public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions, @NonNull int[] grantResults) {**  
 **super.onRequestPermissionsResult(requestCode, permissions, grantResults);**  
 **if (requestCode == LOCATION\_PERMISSION\_REQUEST\_CODE) {**  
 **if (grantResults.length > 0 && grantResults[0] == PackageManager.PERMISSION\_GRANTED) {**  
 **getLocation();**  
 **} else {**  
 **Toast.makeText(this, "Permission Denied!", Toast.LENGTH\_SHORT).show();**  
 **}**  
 **}**  
 **}**  
**}**

**Make changes in colors.xml:**  
**<resources>**  
 **<color name="purple\_500">#6200EE</color>**  
 **<color name="purple\_700">#3700B3</color>**  
 **<color name="teal\_200">#03DAC5</color>**  
 **<color name="white">#FFFFFF</color>**  
 **<color name="black">#000000</color>**  
**</resources>**

**Add line in dependencies in build.gradle:**

**implementation("com.google.android.gms:play-services-location:21.0.1"**

**Output:**

A screenshot of a phone

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**Result:**

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