Department of CSE
SSN College of Engineering

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UCS 1711 - Mobile Application Development Lab

Exercise 6: GPS Location Application

Aim:

To develop a native application that makes use of GPS location information.

Code - GPS Location: Main Activity:

```
1  package com.example.gps;
2
3  import androidx.appcompat.app.AppCompatActivity;
4  import androidx.core.app.ActivityCompat;
5
6  import android.Manifest;
7  import android.content.Context;
8  import android.content.pm.PackageManager;
9  import android.location.Address;
10 import android.location.Geocoder;
11 import android.location.LocationManager;
12 import android.os.Bundle;
13 import android.view.View;
14 import android.widget.Button;
15 import android.widget.EditText;
16 import android.widget.TextView;
17 import android.widget.Toast;
18
19 import java.util.List;
20
21 public class MainActivity extends AppCompatActivity {
22
23     @Override
24     protected void onCreate(Bundle savedInstanceState) {
25         super.onCreate(savedInstanceState);
26         setContentView(R.layout.activity_main);
27
28         EditText locationText = findViewById(R.id.locationText);
29         TextView latitudeText = findViewById(R.id.latitudeText);
30         TextView longitudeText = findViewById(R.id.longitudeText);
31         TextView addressText = findViewById(R.id.addressText);
32         Button getButton = findViewById(R.id.getButton);
33
34         if(ActivityCompat.checkSelfPermission(this, Manifest.permission.
       ACCESS_FINE_LOCATION)
35                 != PackageManager.PERMISSION_GRANTED && ActivityCompat.
       checkSelfPermission(this, Manifest.permission.ACCESS_COARSE_LOCATION)
36                 != PackageManager.PERMISSION_GRANTED){
37             //If permissions are not granted, display message to user and
       exit
38             Toast permissionToast = Toast.makeText(MainActivity.this, "
       Please enable location permission for the application to work!", Toast.
       LENGTH_SHORT);
39             permissionToast.show();
40             return;
41         }
42
```

```
43          getButton.setOnClickListener(new View.OnClickListener() {
44              @Override
45              public void onClick(View v) {
46                  try {
47                      String location = locationText.getText().toString();
48                      Geocoder geocoder = new Geocoder(MainActivity.this);
49                      List<Address> addressList = null;
50                      addressList = geocoder.getFromLocationName(location,
    1);
51
52                      if(addressList != null && addressList.size() > 0){
53                          Address address = addressList.get(0);
54                          latitudeText.setText(Double.toString(address.
    getLatitude()).substring(0, 7));
55                          longitudeText.setText(Double.toString(address.
    getLongitude()).substring(0, 7));
56                          addressText.setText(address.getAddressLine(0));
57                      }
58
59                      else{
60                          Toast errorToast = Toast.makeText(MainActivity.
    this, "Location Not Found!", Toast.LENGTH_SHORT);
61                          errorToast.show();
62                          latitudeText.setText("");
63                          longitudeText.setText("");
64                          addressText.setText("");
65                      }
66
67                  } catch (Exception e) {
68                      Toast errorToast = Toast.makeText(MainActivity.this, "
    Error: "  + e.getMessage(), Toast.LENGTH_SHORT);
69                      errorToast.show();
70                      latitudeText.setText("");
71                      longitudeText.setText("");
72                      addressText.setText("");
73                  }
74              }
75          });
76      }
77  }
```

Code - GPS Location: Main Activity Layout:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
    schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/locationText"
        android:layout_width="180dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="40dp"
        android:layout_marginTop="60dp"
        android:ems="10"
        android:fontFamily="@font/quantico"
        android:hint="White House"
        android:inputType="textPersonName"
        app:layout_constraintStart_toEndOf="@+id/textView2"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="30dp"
        android:fontFamily="@font/quantico"
        android:text="GPS Location Finder"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="28sp"
        android:textStyle="bold"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="80dp"
        android:fontFamily="@font/quantico"
        android:text="Enter Location Name:"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="16sp"
        android:textStyle="bold"
```

```
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="50dp"
        android:fontFamily="@font/quantico"
        android:text="Latitude"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView4" />

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dp"
        android:fontFamily="@font/quantico"
        android:text="Location Details"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="20sp"
        android:textStyle="bold"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView2" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="30dp"
        android:fontFamily="@font/quantico"
        android:text="Longitude:"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView3" />

    <TextView
        android:id="@+id/latitudeText"
        android:layout_width="160sp"
        android:layout_height="wrap_content"
        android:layout_marginStart="130dp"
        android:layout_marginTop="50dp"
```

```
        android:fontFamily="@font/quantico"
        android:textColor="@color/purple_500"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintStart_toEndOf="@+id/textView5"
        app:layout_constraintTop_toBottomOf="@+id/textView4" />

    <TextView
        android:id="@+id/longitudeText"
        android:layout_width="160sp"
        android:layout_height="wrap_content"
        android:layout_marginStart="130dp"
        android:layout_marginTop="30dp"
        android:fontFamily="@font/quantico"
        android:textColor="@color/purple_500"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintStart_toEndOf="@+id/textView5"
        app:layout_constraintTop_toBottomOf="@+id/latitudeText" />

    <Button
        android:id="@+id/getButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:fontFamily="@font/quantico"
        android:text="Get Details"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/addressText" />

    <TextView
        android:id="@+id/textView6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="30dp"
        android:fontFamily="@font/quantico"
        android:text="Address:"
        android:textColor="?android:attr/textColorPrimary"
        android:textSize="16sp"
        android:textStyle="bold"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView5" />

    <TextView
        android:id="@+id/addressText"
        android:layout_width="160sp"
        android:layout_height="wrap_content"
```

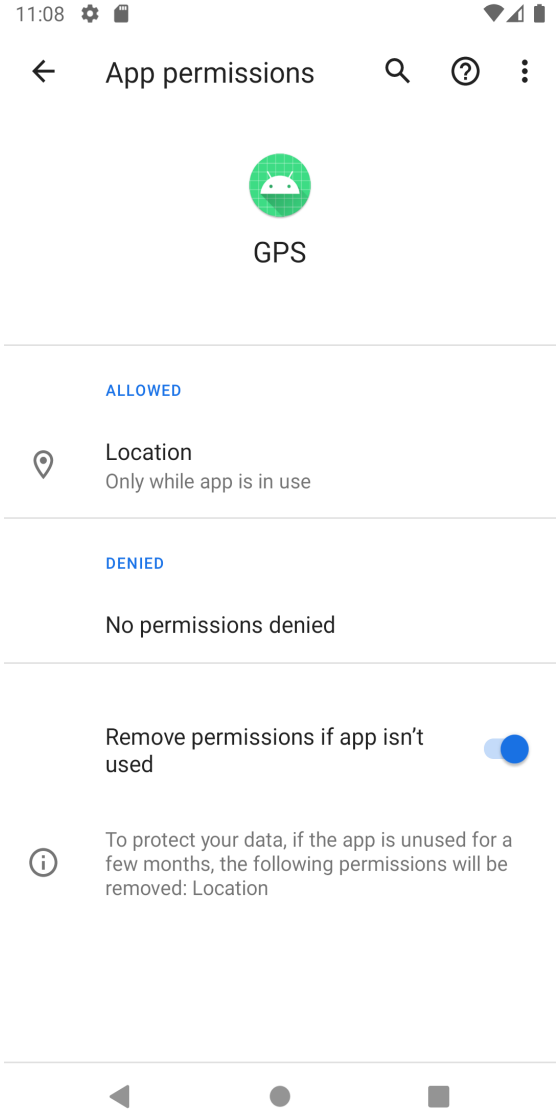
```
149         android:layout_marginStart="130dp"
150         android:layout_marginTop="30dp"
151         android:fontFamily="@font/quantico"
152         android:textColor="@color/purple_500"
153         android:textSize="16sp"
154         android:textStyle="bold"
155         app:layout_constraintStart_toEndOf="@+id/textView5"
156         app:layout_constraintTop_toBottomOf="@+id/longitudeText" />
157
158 </androidx.constraintlayout.widget.ConstraintLayout>
```

Code - GPS Location: Android Manifest XML:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.gps">

    <!--Added Line 6 & 7 to obtain GPS location permission for the application -->
    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
    <uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION" />
    <uses-permission android:name="android.permission.INTERNET" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.GPS">
        <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>
        <meta-data
            android:name="preloaded_fonts"
            android:resource="@array/preloaded_fonts" />
    </application>

</manifest>
```

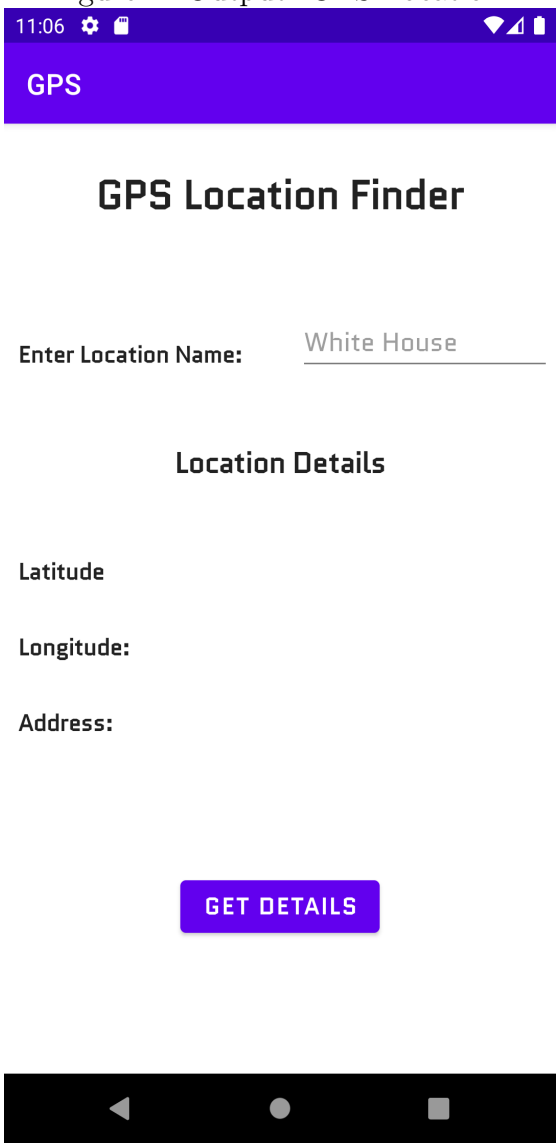
Output: Location Permission:

Figure 1: Output: Location Permission.



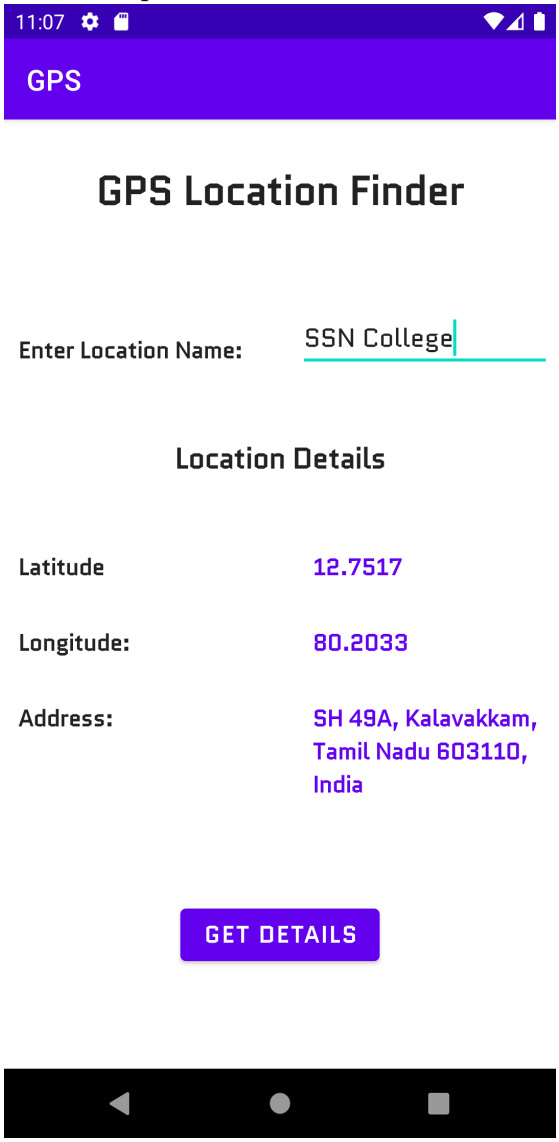
Output: GPS Location:

Figure 2: Output: GPS Location.



Output: GPS Location - SSN College:

Figure 3: Output: GPS Location - SSN College.



Learning Outcome:

- I learnt how to set application permissions for **COARSE LOCATION, FINE LOCATION & INTERNET** using the AndroidManifest.xml file.
- I implemented conditions to check whether location permissions have been granted for the application.
- I learnt about **Geocoder** and its relevant method **getFromLocationName()** to get **Address** details of a particular place.
- I used the **Address** object to retrieve details like **latitude, longitude & street address**.
- I displayed the appropriate GPS results to the user via the UI.
- I was also able to handle error cases wherein the requested location was not found with the use of the Geocoder methods.