

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:

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://
  schemas.android.com/apk/res/android"
3   xmlns:app="http://schemas.android.com/apk/res-auto"
4   xmlns:tools="http://schemas.android.com/tools"
5   android:layout_width="match_parent"
6   android:layout_height="match_parent"
7   tools:context=".MainActivity">
8
9   <EditText
10      android:id="@+id/locationText"
11      android:layout_width="180dp"
12      android:layout_height="wrap_content"
13      android:layout_marginStart="40dp"
14      android:layout_marginTop="60dp"
15      android:ems="10"
16      android:fontFamily="@font/quantico"
17      android:hint="White House"
18      android:inputType="textPersonName"
19      app:layout_constraintStart_toEndOf="@+id/textView2"
20      app:layout_constraintTop_toBottomOf="@+id/textView" />
21
22   <TextView
23      android:id="@+id/textView"
24      android:layout_width="wrap_content"
25      android:layout_height="wrap_content"
26      android:layout_marginTop="30dp"
27      android:fontFamily="@font/quantico"
28      android:text="GPS Location Finder"
29      android:textColor="?android:attr/textColorPrimary"
30      android:textSize="28sp"
31      android:textStyle="bold"
32      app:layout_constraintEnd_toEndOf="parent"
33      app:layout_constraintStart_toStartOf="parent"
34      app:layout_constraintTop_toTopOf="parent" />
35
36   <TextView
37      android:id="@+id/textView2"
38      android:layout_width="wrap_content"
39      android:layout_height="wrap_content"
40      android:layout_marginStart="10dp"
41      android:layout_marginTop="80dp"
42      android:fontFamily="@font/quantico"
43      android:text="Enter Location Name:"
44      android:textColor="?android:attr/textColorPrimary"
45      android:textSize="16sp"
46      android:textStyle="bold"
```

```

47         app:layout_constraintStart_toStartOf="parent "
48         app:layout_constraintTop_toBottomOf="@+id/textView" />
49
50     <TextView
51         android:id="@+id/textView3"
52         android:layout_width="wrap_content"
53         android:layout_height="wrap_content"
54         android:layout_marginStart="10dp"
55         android:layout_marginTop="50dp"
56         android:fontFamily="@font/quantico"
57         android:text="Latitude"
58         android:textColor="?android:attr/textColorPrimary"
59         android:textSize="16sp"
60         android:textStyle="bold"
61         app:layout_constraintStart_toStartOf="parent "
62         app:layout_constraintTop_toBottomOf="@+id/textView4" />
63
64     <TextView
65         android:id="@+id/textView4"
66         android:layout_width="wrap_content"
67         android:layout_height="wrap_content"
68         android:layout_marginTop="50dp"
69         android:fontFamily="@font/quantico"
70         android:text="Location Details"
71         android:textColor="?android:attr/textColorPrimary"
72         android:textSize="20sp"
73         android:textStyle="bold"
74         app:layout_constraintEnd_toEndOf="parent "
75         app:layout_constraintStart_toStartOf="parent "
76         app:layout_constraintTop_toBottomOf="@+id/textView2" />
77
78     <TextView
79         android:id="@+id/textView5"
80         android:layout_width="wrap_content"
81         android:layout_height="wrap_content"
82         android:layout_marginStart="10dp"
83         android:layout_marginTop="30dp"
84         android:fontFamily="@font/quantico"
85         android:text="Longitude:"
86         android:textColor="?android:attr/textColorPrimary"
87         android:textSize="16sp"
88         android:textStyle="bold"
89         app:layout_constraintStart_toStartOf="parent "
90         app:layout_constraintTop_toBottomOf="@+id/textView3" />
91
92     <TextView
93         android:id="@+id/latitudeText "
94         android:layout_width="160sp"
95         android:layout_height="wrap_content"
96         android:layout_marginStart="130dp"
97         android:layout_marginTop="50dp"

```

```

98     android:fontFamily="@font/quantico"
99     android:textColor="@color/purple_500"
100    android:textSize="16sp"
101    android:textStyle="bold"
102    app:layout_constraintStart_toEndOf="@+id/textView5"
103    app:layout_constraintTop_toBottomOf="@+id/textView4" />
104
105    <TextView
106        android:id="@+id/longitudeText"
107        android:layout_width="160sp"
108        android:layout_height="wrap_content"
109        android:layout_marginStart="130dp"
110        android:layout_marginTop="30dp"
111        android:fontFamily="@font/quantico"
112        android:textColor="@color/purple_500"
113        android:textSize="16sp"
114        android:textStyle="bold"
115        app:layout_constraintStart_toEndOf="@+id/textView5"
116        app:layout_constraintTop_toBottomOf="@+id/latitudeText" />
117
118    <Button
119        android:id="@+id/getButton"
120        android:layout_width="wrap_content"
121        android:layout_height="wrap_content"
122        android:fontFamily="@font/quantico"
123        android:text="Get Details"
124        android:textSize="16sp"
125        android:textStyle="bold"
126        app:layout_constraintBottom_toBottomOf="parent"
127        app:layout_constraintEnd_toEndOf="parent"
128        app:layout_constraintStart_toStartOf="parent"
129        app:layout_constraintTop_toBottomOf="@+id/addressText" />
130
131    <TextView
132        android:id="@+id/textView6"
133        android:layout_width="wrap_content"
134        android:layout_height="wrap_content"
135        android:layout_marginStart="10dp"
136        android:layout_marginTop="30dp"
137        android:fontFamily="@font/quantico"
138        android:text="Address: "
139        android:textColor="?android:attr/textColorPrimary"
140        android:textSize="16sp"
141        android:textStyle="bold"
142        app:layout_constraintStart_toStartOf="parent"
143        app:layout_constraintTop_toBottomOf="@+id/textView5" />
144
145    <TextView
146        android:id="@+id/addressText"
147        android:layout_width="160sp"
148        android:layout_height="wrap_content"

```

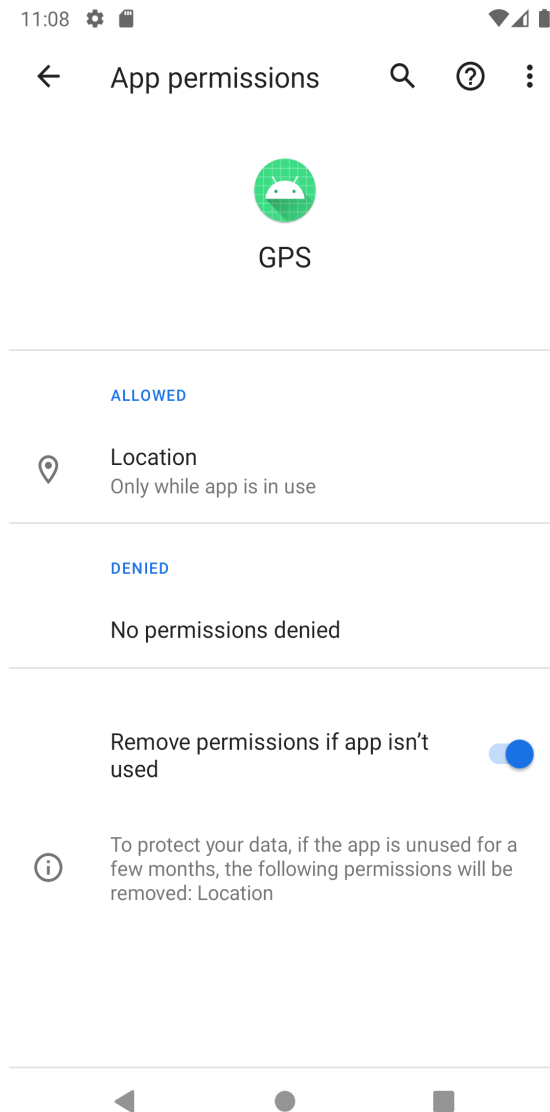
```
149     android:layout_marginStart="130dp"
150     android:layout_marginTop="30dp"
151     android:fontFamily="@font/quantico"
152     android:textColor="@color/purple_500"
153     android:textSize="16sp"
154     android:textStyle="bold"
155     app:layout_constraintStart_toEndOf="@+id/textView5"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

Code - GPS Location: Android Manifest XML:

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3     package="com.example.gps">
4
5     <!--Added Line 6 & 7 to obtain GPS location permission for the
6     application -->
7     <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"
8     />
9     <uses-permission android:name="android.permission.
10     ACCESS_COARSE_LOCATION" />
11     <uses-permission android:name="android.permission.INTERNET" />
12
13     <application
14         android:allowBackup="true"
15         android:icon="@mipmap/ic_launcher"
16         android:label="@string/app_name"
17         android:roundIcon="@mipmap/ic_launcher_round"
18         android:supportsRtl="true"
19         android:theme="@style/Theme.GPS">
20         <activity
21             android:name=".MainActivity"
22             android:exported="true">
23             <intent-filter>
24                 <action android:name="android.intent.action.MAIN" />
25
26                 <category android:name="android.intent.category.LAUNCHER"
27                 />
28             </intent-filter>
29         </activity>
30         <meta-data
31             android:name="preloaded_fonts"
32             android:resource="@array/preloaded_fonts" />
33     </application>
34 </manifest>
```

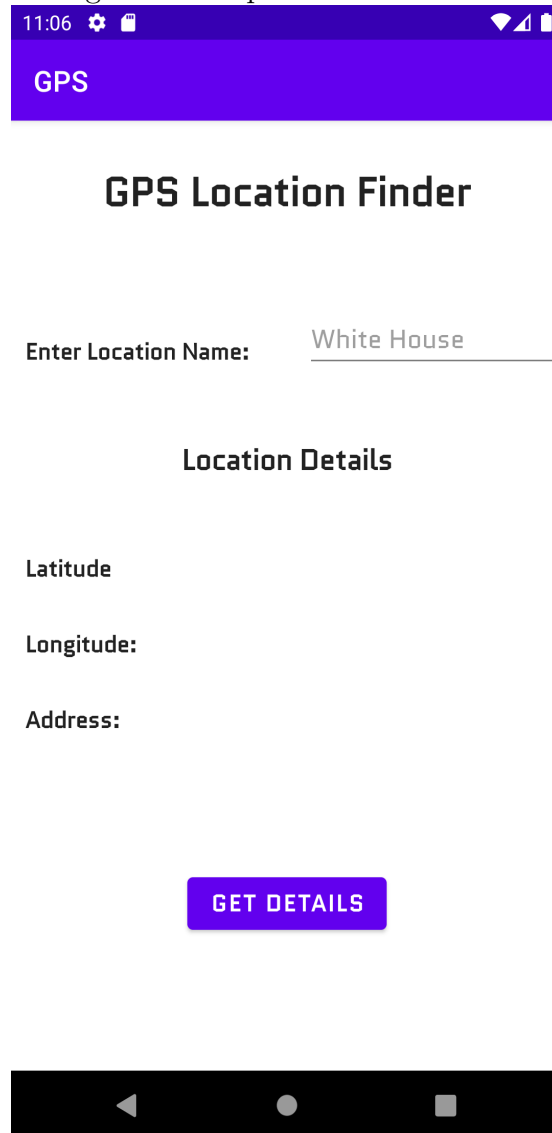

Output: Location Permission:

Figure 1: Output: Location Permission.



Output: GPS Location:

Figure 2: Output: GPS Location.



The screenshot shows a mobile application interface. At the top, there is a status bar with the time 11:06, a gear icon, a document icon, and signal/battery indicators. Below the status bar is a blue header with the text "GPS". The main content area has a title "GPS Location Finder" in bold. Below the title is a label "Enter Location Name:" followed by a text input field containing "White House". Underneath the input field is the section title "Location Details". This section contains three labels: "Latitude", "Longitude:", and "Address:", each followed by a text input field. At the bottom of the form is a blue button with the text "GET DETAILS". The very bottom of the screen shows the Android navigation bar with back, home, and recents icons.

11:06

GPS

GPS Location Finder

Enter Location Name:

Location Details

Latitude

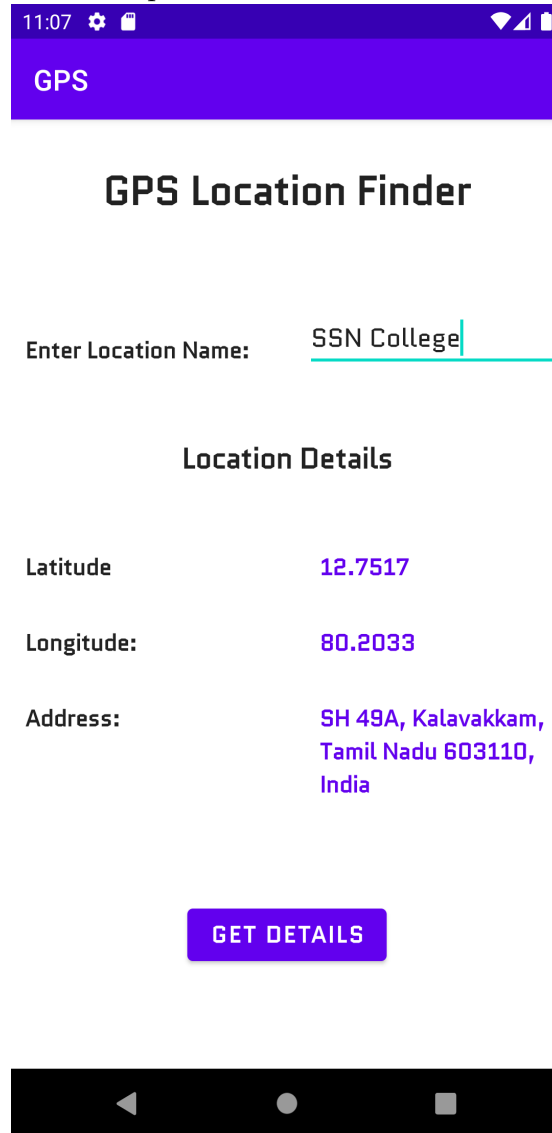
Longitude:

Address:

[GET DETAILS](#)

Output: GPS Location - SSN College:

Figure 3: Output: GPS Location - SSN College.



The screenshot shows a mobile application interface. At the top, there is a status bar with the time 11:07 and icons for settings, a folder, Wi-Fi, and battery. Below the status bar is a blue header with the text "GPS". The main content area has a title "GPS Location Finder" in bold black text. Below the title is a form with the label "Enter Location Name:" and a text input field containing "SSN College". Underneath the input field is a section titled "Location Details" which contains three rows of data: "Latitude" with the value "12.7517", "Longitude:" with the value "80.2033", and "Address:" with the value "SH 49A, Kalavakkam, Tamil Nadu 603110, India". At the bottom of the form is a blue button with the text "GET DETAILS". The bottom of the screen shows a black navigation bar with three icons: a back arrow, a home circle, and a recent apps square.

Latitude	12.7517
Longitude:	80.2033
Address:	SH 49A, Kalavakkam, Tamil Nadu 603110, India

GET DETAILS

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.