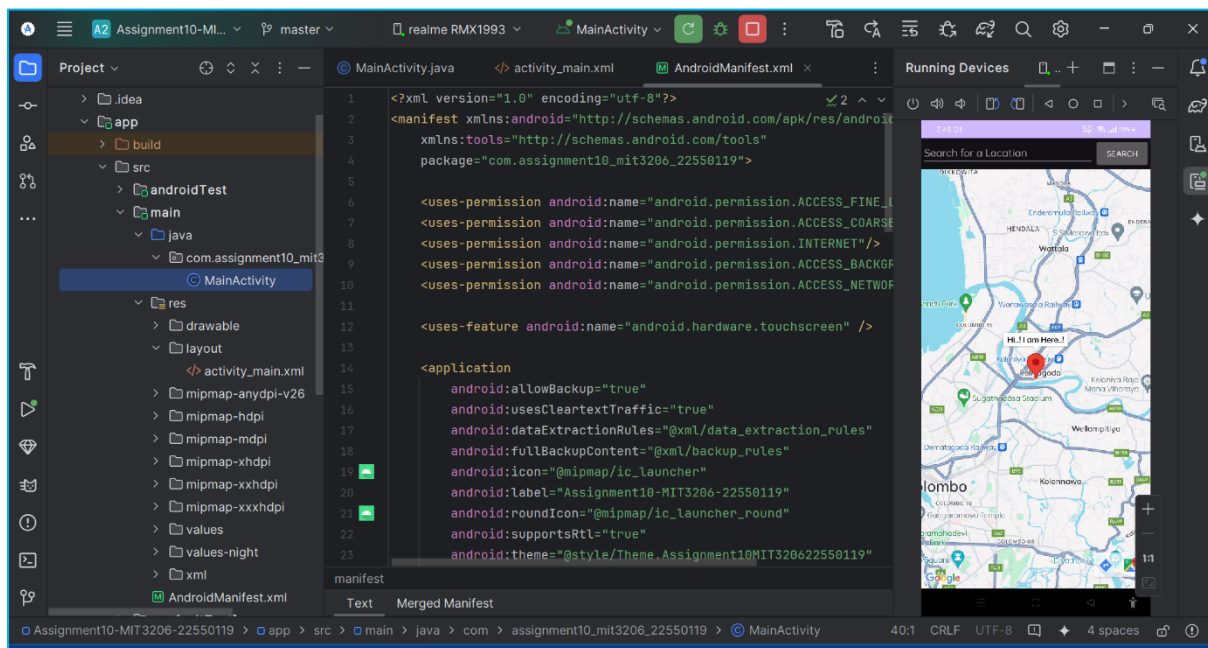


- ❖ Course Module : MIT3206 - Mobile Computing
- ❖ Course Lecturer : Senior Lecturer Gihan P. Seneviratne Sir
  
- ❖ Assignment 10 : Using Google Maps for Android
- ❖ Used Android Studio : Android Studio Koala | 2024.1.1
- ❖ GitHub Private Repository Link :  
<https://github.com/NavinduMadusanka/Assignment10-MIT3206-22550119.git>
  
- ❖ Student Name : Kumarage Navindu Madusanka Dias (K.N.M. Dias)
- ❖ Student Index No : 22550119
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Assignment10-MIT3206-22550119

## Assignment 10 : Using Google Maps for Android

Below is a summary of what I have learned and focused on in this assignment.

### 1. Android Components

- **API level**

Android Version	API Level	Version Name
Android 7.0	24	Nougat

- **Common Methods for using in Maps**

No	Method	Description
1	fetchLocation()	This method returns the currently displayed user location
2	onRequestPermissionsResult()	This method is used in Android that is called when the user responds to a permission request.
3	onMapReady()	This function is called when the map is ready to be used
4.	buildGoogleApiClient()	This method is used to initialize the Google Play Services

- **Permissions**

- uses-permission - Access INTERNET
- uses-permission - ACCESS\_FINE\_LOCATION
- uses-permission - ACCESS\_COARSE\_LOCATION
- uses-permission - ACCESS\_NETWORK\_STATE
- uses-permission - ACCESS\_BACKGROUND\_LOCATION

- **Special Requirement**

meta - data        - com.google.android.geo.API KEY

API Key & Value - "AlzaSyCqbaEAhGHV1IC21U8Hj0dHxwi90koZehM"

An API key is needed to access the Google Maps servers.

- **Newly learned key points in this assignment**

- How to get Google API Key
- Working with Map activity

- **Dependencies**

Dependencies in the build.gradle (:app),

- implementation libs.play.services.maps  
(implementation 'com.google.android.gms:play-services-maps:19.0.0')
- implementation libs.play.services.location  
(implementation 'com.google.android.gms:play-services-location:21.3.0')

- **tools:targetApi="34" in AndroidManifest.xml**

- **uses-feature android:name="android.hardware.touchscreen"**

- **android.enableJetifier=true in gradle.properties**

## **2. Functionality of the mobile application**

- A Location Client to provide location services
- A MapFragment to laying out Android content and display maps
- Develop an Android App which accepts a location or the Place
- Display the relevant map on the screen

### 3. Running the Application on my android mobile device

I was running the android app for testing in my android mobile device.

My android mobile device is Realme X2 RMX1993.

Below is a photo of my android mobile device (Realme X2 RMX1993) while the app was running.

My android mobile device display setting is set as dark mode option.

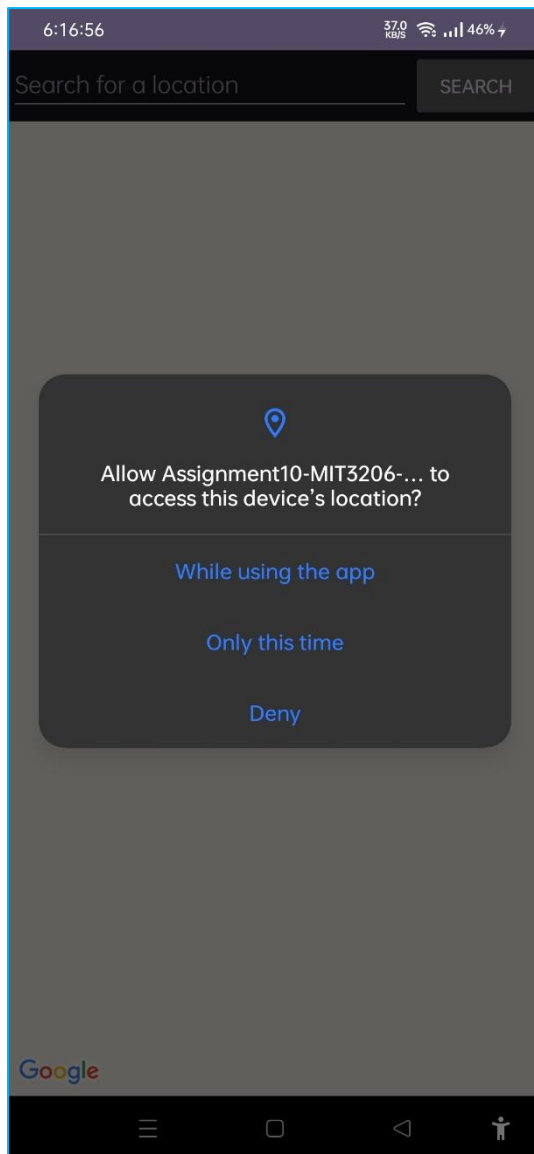


Photo 1 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993

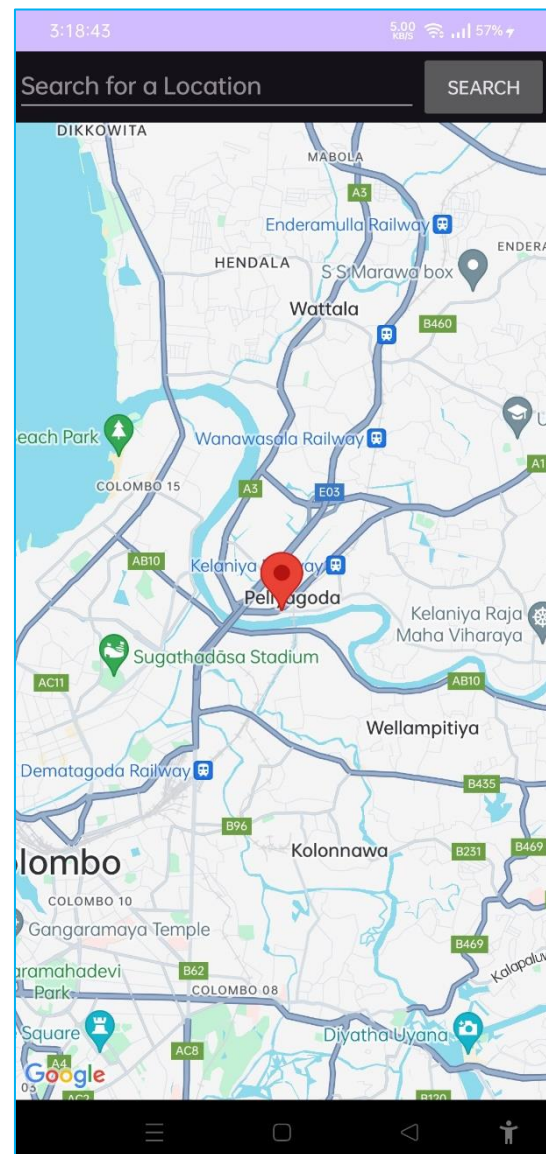


Photo 2 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993

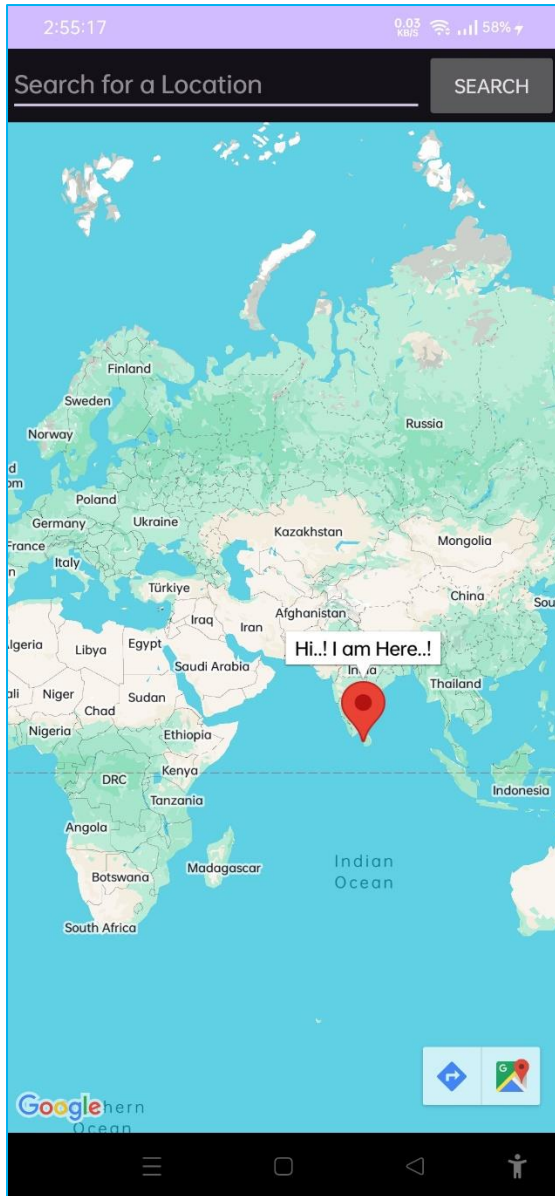


Photo 3 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993

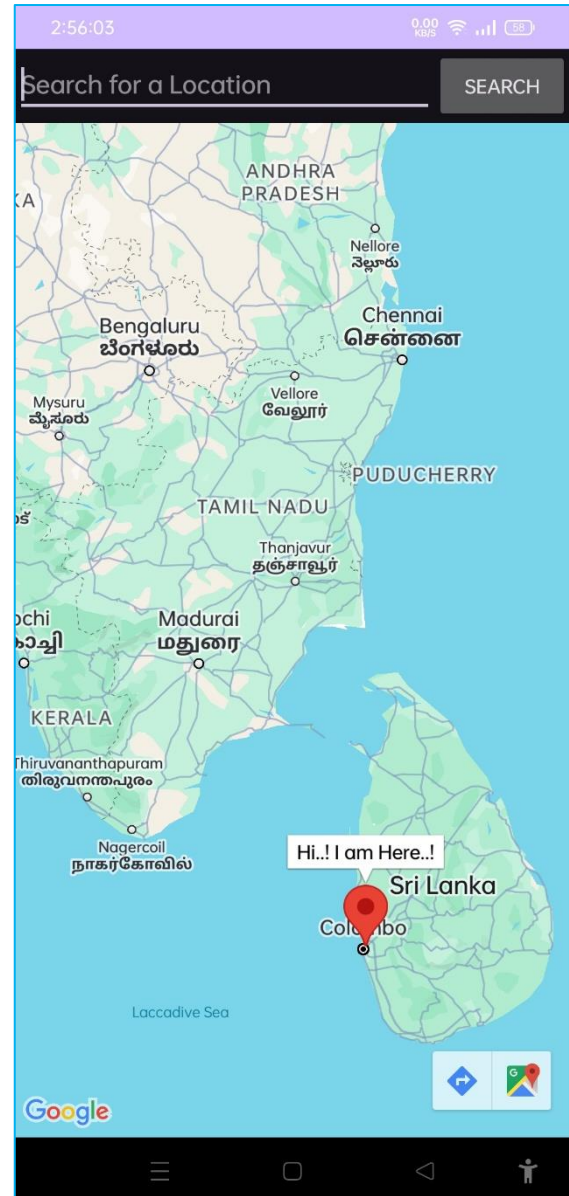
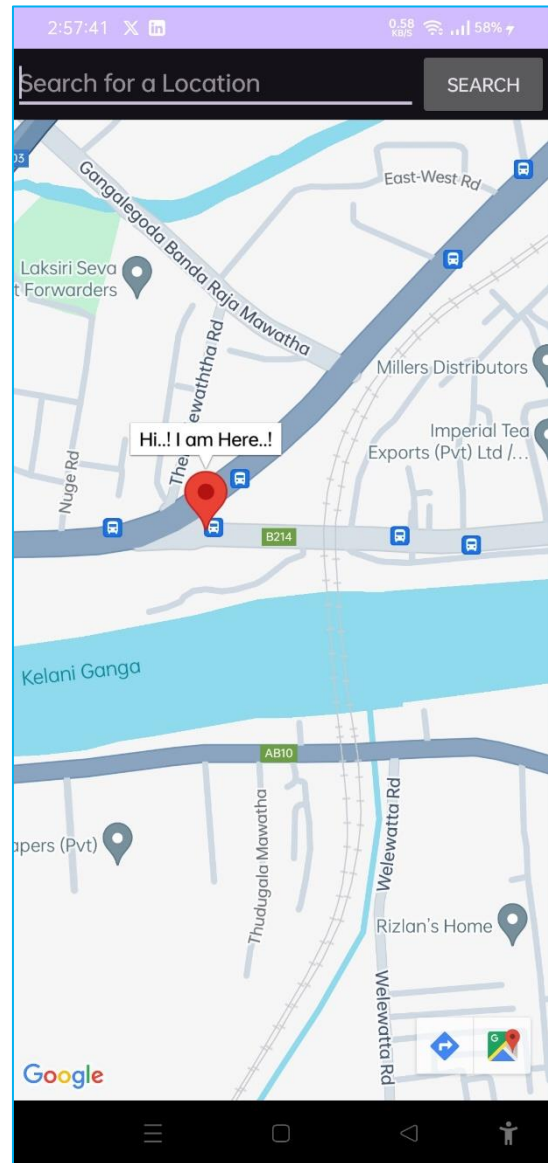


Photo 4 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993





**Photo 5 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993**



**Photo 6 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993**

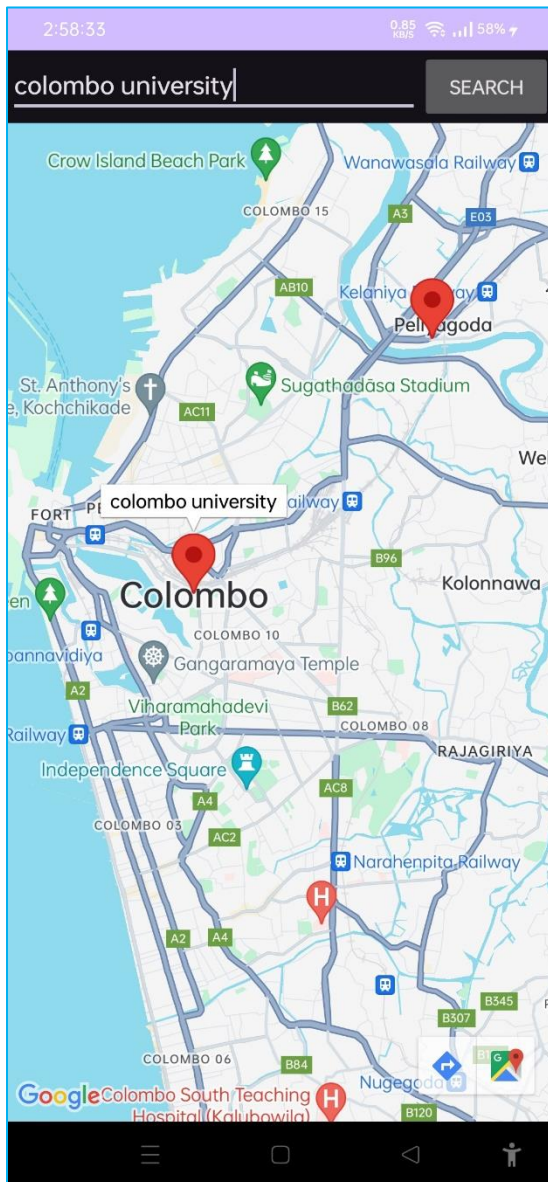


Photo 7 : Assignment10-MIT3206-22550119 in  
Realme X2 RMX1993

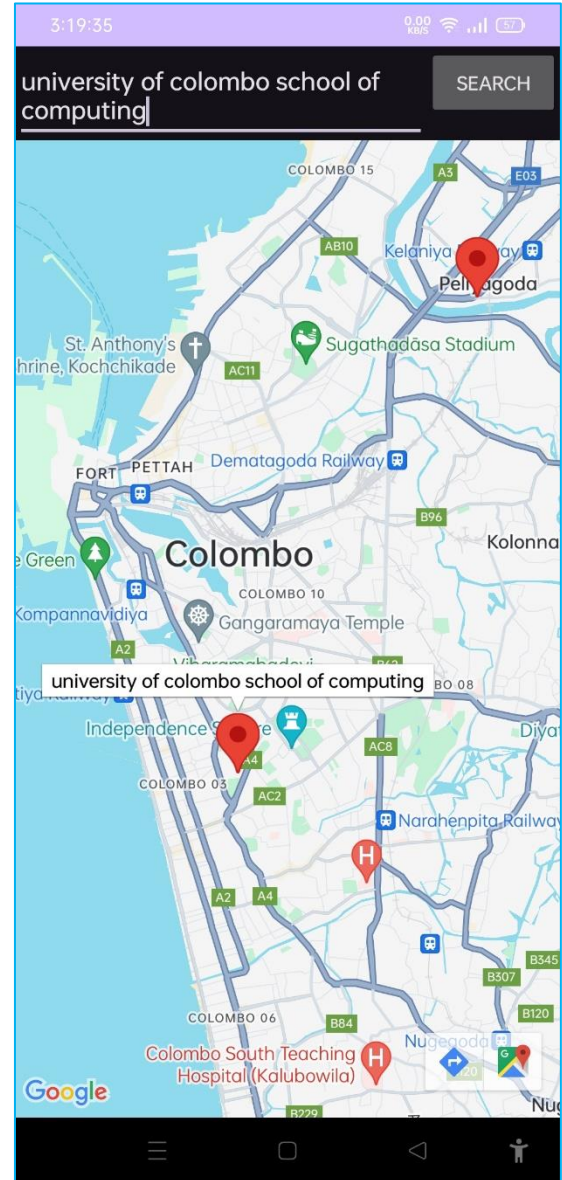


Photo 8 : Assignment10-MIT3206-22550119 in  
Realme X2 RMX1993

#### 4. Main Coding files

- **MainActivity.java**

```
package com.assignment10_mit3206_22550119;

import android.Manifest;
import android.content.pm.PackageManager;
import android.location.Address;
import android.location.Geocoder;
import android.location.Location;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.core.app.ActivityCompat;
import androidx.fragment.app.FragmentActivity;

import com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationServices;
import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;
import com.google.android.gms.tasks.OnSuccessListener;
import com.google.android.gms.tasks.Task;

import java.io.IOException;
import java.util.Collections;
import java.util.List;

public class MainActivity extends FragmentActivity implements OnMapReadyCallback {
    Location currentLocation;
    FusedLocationProviderClient fusedLocationProviderClient;
    private static final int REQUEST_CODE = 101;
    private GoogleMap mMap;
    private EditText searchEditText;
    private Button searchButton;

    @Override
```



```

protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    fusedLocationProviderClient = LocationServices.getFusedLocationProviderClient(this);
    fetchLocation();

    searchEditText = findViewById(R.id.search_edit_text);
    searchButton = findViewById(R.id.search_button);

    searchButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            String searchQuery = searchEditText.getText().toString();
            Geocoder geocoder = new Geocoder(MainActivity.this);
            List<Address> addresses;
            try {
                addresses = geocoder.getFromLocationName(searchQuery, 1);
            } catch (IOException e) {
                e.printStackTrace();
                addresses = Collections.emptyList(); // or some other default value
            }
            if (addresses != null && addresses.size() > 0) {
                Address address = addresses.get(0);
                LatLng latLng = new LatLng(address.getLatitude(), address.getLongitude());
                MarkerOptions markerOptions = new
MarkerOptions().position(latLng).title(searchQuery);
                mMap.animateCamera(CameraUpdateFactory.newLatLng(latLng));
                mMap.animateCamera(CameraUpdateFactory.newLatLngZoom(latLng, 13));
                mMap.addMarker(markerOptions);
            } else {
                Toast.makeText(MainActivity.this, "Location is not Found",
Toast.LENGTH_SHORT).show();
            }
        }
    });
}

private void fetchLocation() {
    if (ActivityCompat.checkSelfPermission(
        this, android.Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED && ActivityCompat.checkSelfPermission(
        this, android.Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
        ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.ACCESS_FINE_LOCATION}, REQUEST_CODE);
    }
}

```

```

        return;
    }
    Task<Location> task = fusedLocationProviderClient.getLastLocation();
    task.addOnSuccessListener(new OnSuccessListener<Location>() {
        @Override
        public void onSuccess(Location location) {
            if (location != null) {
                currentLocation = location;
                Toast.makeText(getApplicationContext(), currentLocation.getLatitude() + "" +
currentLocation.getLongitude(), Toast.LENGTH_SHORT).show();
                SupportMapFragment supportMapFragment = (SupportMapFragment)
getSupportFragmentManager().findFragmentById(R.id.myMap);
                assert supportMapFragment != null;
                supportMapFragment.getMapAsync(MainActivity.this);
            }
        }
    });
}

@Override
public void onMapReady(GoogleMap googleMap) {
    mMap = googleMap;
    LatLng latLng = new LatLng(currentLocation.getLatitude(),
currentLocation.getLongitude());
    MarkerOptions markerOptions = new MarkerOptions().position(latLng).title("Hi..! I am
Here..!");
    mMap.animateCamera(CameraUpdateFactory.newLatLng(latLng));
    mMap.animateCamera(CameraUpdateFactory.newLatLngZoom(latLng, 13));
    mMap.addMarker(markerOptions);

    // Add a search bar to search for locations
    mMap.setOnMapClickListener(new GoogleMap.OnMapClickListener() {
        @Override
        public void onMapClick(LatLng latLng) {
            // Create a search dialog to search for locations
            // SearchDialog searchDialog = new SearchDialog(MainActivity.this, mMap);
            // searchDialog.show();
        }
    });
}

@Override
public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,
@NonNull int[] grantResults) {
    switch (requestCode) {

```

```

        case REQUEST_CODE:
            if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
                fetchLocation();
            }
            break;
        }
    }
}

```

- **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">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <EditText
            android:id="@+id/search_edit_text"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:textStyle="bold"
            android:layout_weight="1"
            android:hint="Search for a Location" />

        <Button
            android:id="@+id/search_button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textStyle="bold"
            android:text="Search" />

    </LinearLayout>

    <androidx.fragment.app.FragmentContainerView
        android:id="@+id/myMap"
        android:name="com.google.android.gms.maps.SupportMapFragment"
        android:layout_width="match_parent"
        android:textStyle="bold"

```

```
        android:layout_height="0dp"
        android:layout_weight="1" />
</LinearLayout>
```

- **AndroidManifest.xml**

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.assignment10_mit3206_22550119">

    <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"/>
    <uses-permission
        android:name="android.permission.ACCESS_BACKGROUND_LOCATION"/>
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE"/>

    <uses-feature android:name="android.hardware.touchscreen" />

    <application
        android:allowBackup="true"
        android:usesCleartextTraffic="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="Assignment10-MIT3206-22550119"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Assignment10MIT320622550119"
        tools:targetApi="34">

        <meta-data
            android:name="com.google.android.geo.API_KEY"
            android:value="AlzaSyCqbaEAhGHV1IC21U8Hj0dHxwi90koZehM"/>

        <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>
```

- **build.gradle (:app)**

```
plugins {
    alias(libs.plugins.android.application)
}

android {
    namespace 'com.assignment10_mit3206_22550119'
    compileSdk 34

    defaultConfig {
        applicationId "com.assignment10_mit3206_22550119"
        minSdk 24
        targetSdk 34
        versionCode 1
        versionName "1.0"

        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
    }

    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-
rules.pro'
        }
    }
    compileOptions {
        sourceCompatibility JavaVersion.VERSION_1_8
        targetCompatibility JavaVersion.VERSION_1_8
    }
}

dependencies {

    implementation libs.appcompat
    implementation libs.material
```



```
implementation libs.activity
implementation libs.constraintlayout
implementation libs.play.services.maps
implementation libs.play.services.location
testImplementation libs.junit
androidTestImplementation libs.ext.junit
androidTestImplementation libs.espresso.core
}
```

- **gradle.properties**

```
# Project-wide Gradle settings.
# IDE (e.g. Android Studio) users:
# Gradle settings configured through the IDE *will override*
# any settings specified in this file.
# For more details on how to configure your build environment visit
# http://www.gradle.org/docs/current/userguide/build_environment.html
# Specifies the JVM arguments used for the daemon process.
# The setting is particularly useful for tweaking memory settings.
org.gradle.jvmargs=-Xmx2048m -Dfile.encoding=UTF-8
# When configured, Gradle will run in incubating parallel mode.
# This option should only be used with decoupled projects. For more details, visit
# https://developer.android.com/r/tools/gradle-multi-project-decoupled-projects
# org.gradle.parallel=true
# AndroidX package structure to make it clearer which packages are bundled with the
# Android operating system, and which are packaged with your app's APK
# https://developer.android.com/topic/libraries/support-library/androidx-rn
android.useAndroidX=true
# Enables namespacing of each library's R class so that its R class includes only the
# resources declared in the library itself and none from the library's dependencies,
# thereby reducing the size of the R class for that library
android.nonTransitiveRClass=true
android.enableJetifier=true
```