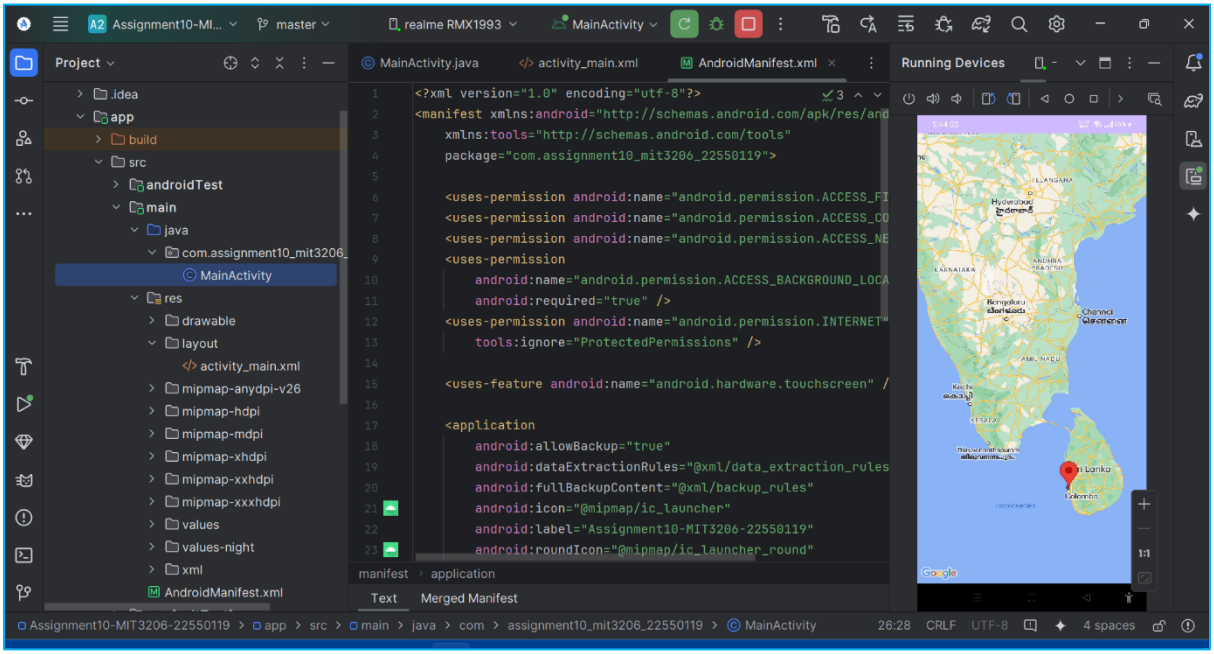
- **Course Module : MIT3206 – Mobile Computing**
- **Course Lecturer : Senior Lecturer Gihan P. Seneviratne Sir**

- **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**
- **Student Registration No : 2022/MIT/011**
- **Email Address : navindu09@gmail.com**
- **Contact No : +94702678624**


**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 |

- **Methods**

| No | Method | Description |
|---|---|---|
| 1 | getMyLocation() | This method returns the currently displayed user location |
| 2 | clear() | This method removes everything from the map |
| 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 - "AIzaSyDe9MX8rVtI_2wc7hp45buzgsQubWxY7hE”

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

  This key is free and we can use it with any of applications.

- **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 AndroidMainfest.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.

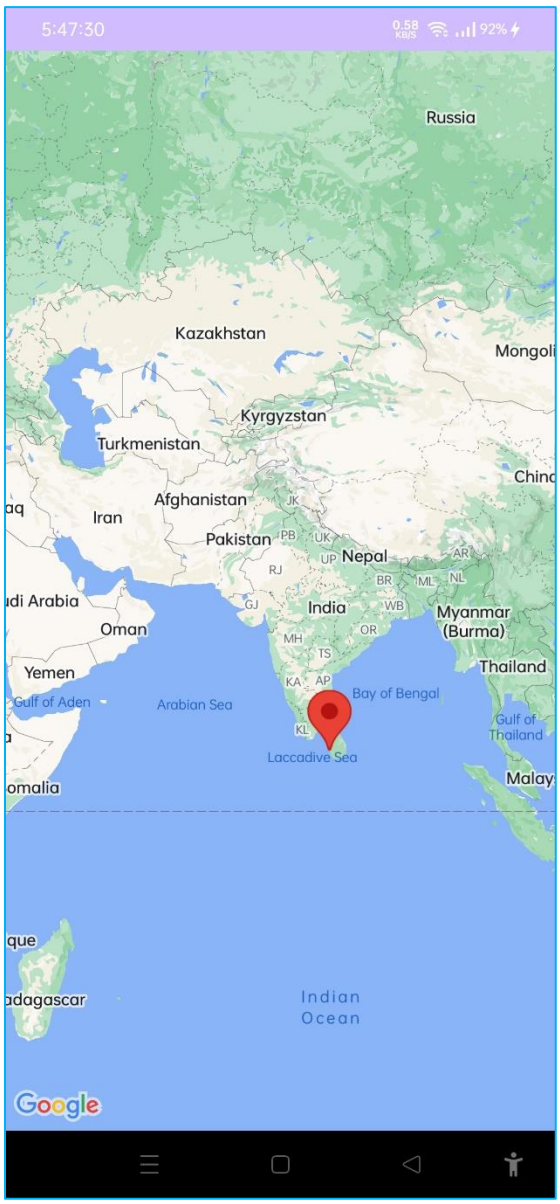



**Photo 1 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993**

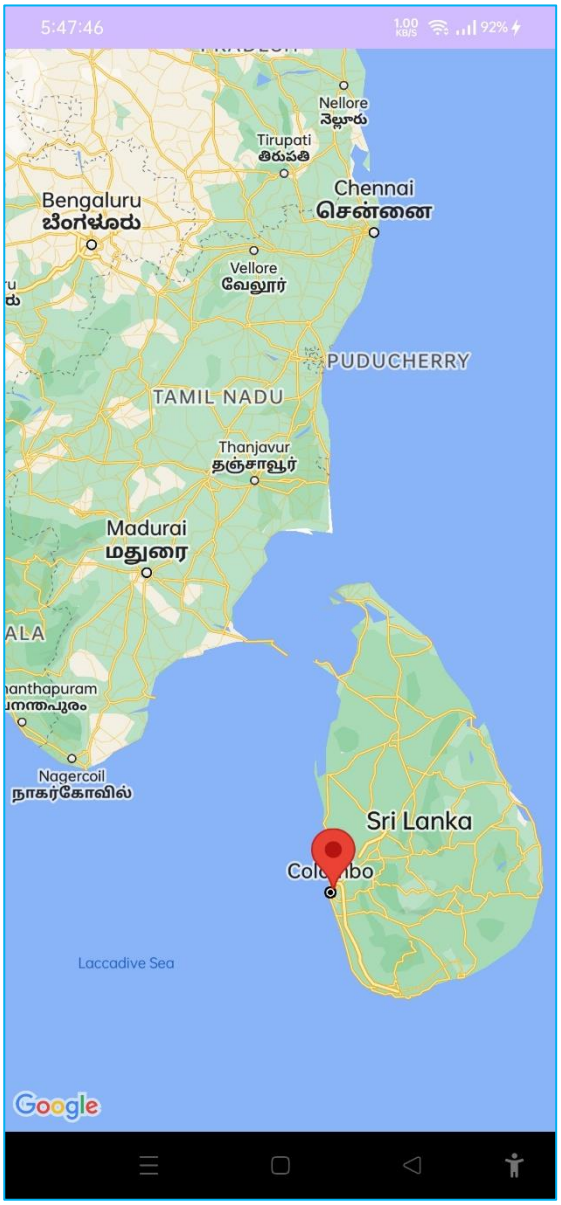



**Photo 2 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993**


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

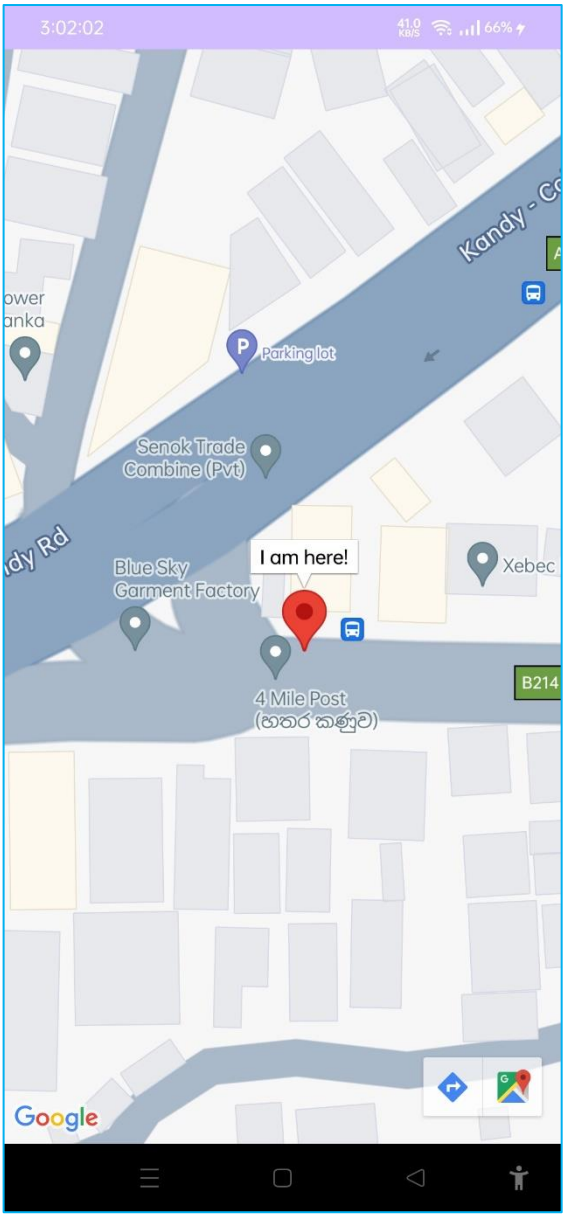



**Photo 4 : Assignment10-MIT3206-22550119 in Realme X2 RMX1993**

## 4. Main Coding files

- **MainActivity.java**

```
package com.assignment10_mit3206_22550119;

import android.Manifest;
import android.content.pm.PackageManager;
import android.location.Location;
import android.os.Bundle;
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;

public class MainActivity extends FragmentActivity implements
OnMapReadyCallback {
    Location currentLocation;
    FusedLocationProviderClient fusedLocationProviderClient;
    private static final int REQUEST_CODE = 101;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        fusedLocationProviderClient =
LocationServices.getFusedLocationProviderClient(this);
        fetchLocation();
    }
    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) {
        LatLng latLng = new LatLng(currentLocation.getLatitude(),
currentLocation.getLongitude());
        MarkerOptions markerOptions = new
MarkerOptions().position(latLng).title("I am here!");
        googleMap.animateCamera(CameraUpdateFactory.newLatLng(latLng));
        googleMap.animateCamera(CameraUpdateFactory.newLatLngZoom(latLng,
5));
        googleMap.addMarker(markerOptions);
    }
    @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"?>

<androidx.fragment.app.FragmentContainerView
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/myMap"
    android:name="com.google.android.gms.maps.SupportMapFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity" />
```

- **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.ACCESS_NETWORK_STATE"
```

```
/>
    <uses-permission
        android:name="android.permission.ACCESS_BACKGROUND_LOCATION"
        android:required="true" />
    <uses-permission android:name="android.permission.INTERNET"
        tools:ignore="ProtectedPermissions" />

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

    <application
        android:allowBackup="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="AIzaSyDe9MX8rVtI_2wc7hp45buzgsQubWxY7hE"/>

        <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
```