Practical No 32

XML Code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.co
m/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp">

   <EditText

android:id="@+id/editTextStartAddress"

android:layout_width="match_parent"

android:layout_height="wrap_content"
      android:hint="Fetching Current
Location..."
      android:inputType="text"
      android:focusable="false"/>

   <EditText

android:id="@+id/editTextEndAddress"

android:layout_width="match_parent"

android:layout_height="wrap_content"
      android:hint="Enter Destination
Address"
      android:inputType="text"/>

   <Button

android:id="@+id/btnCalculateDistance"

android:layout_width="match_parent"

android:layout_height="wrap_content"
      android:text="Find Route and
Distance"/>

   <TextView
      android:id="@+id/tvDistance"

android:layout_width="match_parent"

android:layout_height="wrap_content"
      android:text="Distance: "
      android:textSize="18sp"
      android:textStyle="bold"
      android:padding="8dp"/>

   <fragment
      android:id="@+id/google_map"

android:name="com.google.android.gms.
maps.SupportMapFragment"

android:layout_width="match_parent"
      android:layout_height="0dp"
```

```
        android:layout_weight="1"/>
</LinearLayout>
```

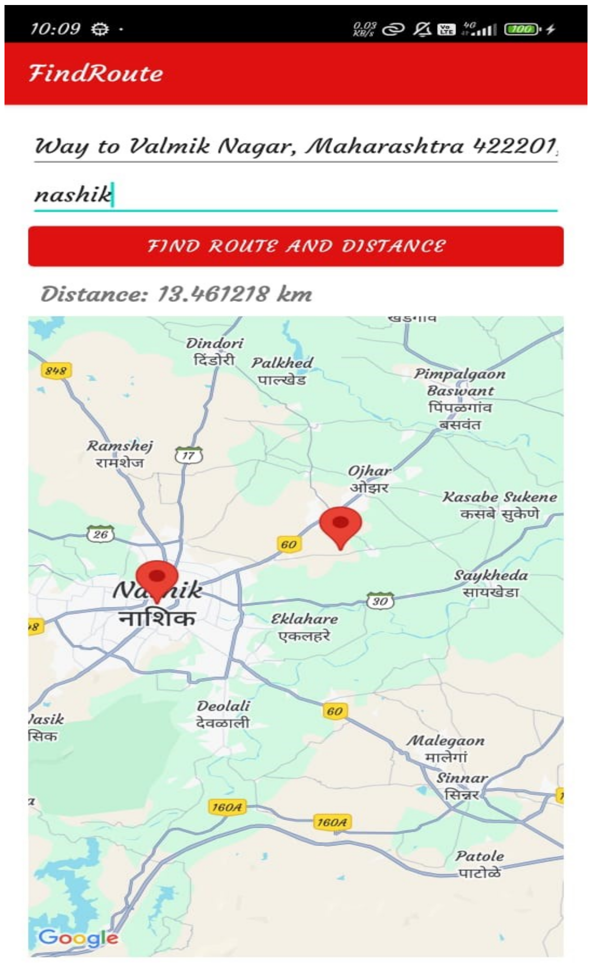
Java Code

```
package com.example.findroute;

import android.Manifest;
import android.annotation.SuppressLint;
import
android.content.pm.PackageManager;
import android.location.Address;
import android.location.Geocoder;
import android.location.Location;
import android.os.Bundle;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import androidx.annotation.NonNull;
import
androidx.appcompat.app.AppCompatActiv
ity;
import androidx.core.app.ActivityCompat;

import
com.google.android.gms.location.FusedLo
cationProviderClient;
import
com.google.android.gms.location.Location
Services;
import
com.google.android.gms.maps.CameraUp
dateFactory;
import
com.google.android.gms.maps.GoogleMap
;
import
com.google.android.gms.maps.OnMapRea
dyCallback;
import
com.google.android.gms.maps.SupportMa
pFragment;
import
com.google.android.gms.maps.model.LatL
ng;
import
com.google.android.gms.maps.model.Mar
kerOptions;

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

public class MainActivity extends
AppCompatActivity implements
OnMapReadyCallback {

   private GoogleMap mMap;
   private EditText editTextStartAddress,
editTextEndAddress;
   private Button btnCalculateDistance;
   private TextView tvDistance;
   private FusedLocationProviderClient
fusedLocationProviderClient;
   private static final int
LOCATION_PERMISSION_REQUEST_C
ODE = 1001;

   @SuppressLint("MissingInflatedId")
   @Override
   protected void onCreate(Bundle
savedInstanceState) {
       super.onCreate(savedInstanceState);

setContentView(R.layout.activity_main);

       editTextStartAddress =
findViewById(R.id.editTextStartAddress);
       editTextEndAddress =
findViewById(R.id.editTextEndAddress);
       btnCalculateDistance =
findViewById(R.id.btnCalculateDistance);
       tvDistance =
findViewById(R.id.tvDistance);

       fusedLocationProviderClient =
LocationServices.getFusedLocationProvid
erClient(this);

        SupportMapFragment mapFragment
= (SupportMapFragment)
getSupportFragmentManager().findFragm
entById(R.id.google_map);
        if (mapFragment != null) {
            mapFragment.getMapAsync(this);
        }

        // Fetch Current Location
        getCurrentLocation();


btnCalculateDistance.setOnClickListener(
v -> calculateRouteDistance());
    }

    @Override
    public void onMapReady(@NonNull
GoogleMap googleMap) {
        mMap = googleMap;
    }

    private void getCurrentLocation() {
        if
(ActivityCompat.checkSelfPermission(this
,
Manifest.permission.ACCESS_FINE_LOC
ATION) !=
PackageManager.PERMISSION_GRANTE
D) {

ActivityCompat.requestPermissions(this,
new
String[]{Manifest.permission.ACCESS_FI
NE_LOCATION},
LOCATION_PERMISSION_REQUEST_C
ODE);
            return;
        }
```

```
fusedLocationProviderClient.getLastLocat
ion().addOnSuccessListener(location -> {
            if (location != null) {
                String address =
getAddressFromLocation(location.getLatit
ude(), location.getLongitude());

editTextStartAddress.setText(address);
            } else {
                Toast.makeText(this, "Unable to
get current location!",
Toast.LENGTH_SHORT).show();
            }
        });
    }

    private String
getAddressFromLocation(double latitude,
double longitude) {
        Geocoder geocoder = new
Geocoder(this, Locale.getDefault());
        try {
            List<Address> addresses =
geocoder.getFromLocation(latitude,
longitude, 1);
            if (addresses != null &&
!addresses.isEmpty()) {
                return
addresses.get(0).getAddressLine(0);
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
        return "Unknown Location";
    }

    private void calculateRouteDistance() {
        String startAddress =
editTextStartAddress.getText().toString();
        String endAddress =
editTextEndAddress.getText().toString();

        if (startAddress.isEmpty() ||
endAddress.isEmpty()) {
```

```
            Toast.makeText(this, "Please enter
both addresses!",
Toast.LENGTH_SHORT).show();
            return;
        }

        LatLng startLatLng =
getLocationFromAddress(startAddress);
        LatLng endLatLng =
getLocationFromAddress(endAddress);

        if (startLatLng == null || endLatLng
== null) {
            Toast.makeText(this, "Invalid
address! Try again.",
Toast.LENGTH_SHORT).show();
            return;
        }

        // Calculate Distance
        float[] results = new float[1];
        Location.distanceBetween(
                startLatLng.latitude,
startLatLng.longitude,
                endLatLng.latitude,
endLatLng.longitude,
                results);

        float distanceInKm = results[0] /
1000;
        tvDistance.setText("Distance: " +
distanceInKm + " km");

        // Show Route on Map
        mMap.clear();
        mMap.addMarker(new
MarkerOptions().position(startLatLng).titl
e("Start Location"));
        mMap.addMarker(new
MarkerOptions().position(endLatLng).title
("Destination"));

mMap.animateCamera(CameraUpdateFact
ory.newLatLngZoom(startLatLng, 10f));
    }

    private LatLng
getLocationFromAddress(String address) {
        Geocoder geocoder = new
Geocoder(this, Locale.getDefault());
        try {
            List<Address> addresses =
geocoder.getFromLocationName(address,
1);
            if (addresses != null &&
!addresses.isEmpty()) {
                return new
LatLng(addresses.get(0).getLatitude(),
addresses.get(0).getLongitude());
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
        return null;
    }
}
```

Output



10:09

FindRoute

Way to Valmik Nagar, Maharashtra 422201

nashik

FIND ROUTE AND DISTANCE

Distance: 13.461218 km