Experiment - 8

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Aim : Develop a native application that uses GPS location information.

#Theory

Program:

MyActivity.java

```
package com.example.exp8;

import android.app.Activity;
import android.app.AlertDialog;
import android.content.DialogInterface;
import android.content.Intent;
import android.location.Location;
import android.location.LocationManager;
import android.os.Bundle;
import android.os.Handler;
import android.os.Message;
import android.provider.Settings;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MyActivity extends Activity {

   Button btnGPSShowLocation;
   Button btnShowAddress;
   TextView tvAddress;

   AppLocationService appLocationService;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      tvAddress = (TextView) findViewById(R.id.tvAddress);
      appLocationService = new AppLocationService(
            MyActivity.this);

      btnGPSShowLocation = (Button) findViewById(R.id.btnGPSShowLocation);
      btnGPSShowLocation.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View arg0) {
            Location gpsLocation = appLocationService
                  .getLocation(LocationManager.GPS_PROVIDER);
            if (gpsLocation != null) {
               double latitude = gpsLocation.getLatitude();
               double longitude = gpsLocation.getLongitude();
               String result = "Latitude: " + gpsLocation.getLatitude() +
                     " Longitude: " + gpsLocation.getLongitude();
               tvAddress.setText(result);
            } else {
               showSettingsAlert();
            }
         }
      });

      btnShowAddress = (Button) findViewById(R.id.btnShowAddress);
      btnShowAddress.setOnClickListener(new View.OnClickListener() {
         @Override
```

```
        public void onClick(View arg0) {

            Location location = appLocationService
                    .getLocation(LocationManager.GPS_PROVIDER);

            //you can hard-code the lat & long if you have issues with getting it
            //remove the below if-condition and use the following couple of lines
            //double latitude = 37.422005;
            //double longitude = -122.084095

            if (location != null) {
                double latitude = location.getLatitude();
                double longitude = location.getLongitude();
                LocationAddress locationAddress = new LocationAddress();
                locationAddress.getAddressFromLocation(latitude, longitude,
                        getApplicationContext(), new GeocoderHandler());
            } else {
                showSettingsAlert();
            }

        }
    });

}

public void showSettingsAlert() {
    AlertDialog.Builder alertDialog = new AlertDialog.Builder(
            MyActivity.this);
    alertDialog.setTitle("SETTINGS");
    alertDialog.setMessage("Enable Location Provider! Go to settings menu?");
    alertDialog.setPositiveButton("Settings",
            new DialogInterface.OnClickListener() {
                public void onClick(DialogInterface dialog, int which) {
                    Intent intent = new Intent(
                            Settings.ACTION_LOCATION_SOURCE_SETTINGS);
                    MyActivity.this.startActivity(intent);
                }
            });
    alertDialog.setNegativeButton("Cancel",
            new DialogInterface.OnClickListener() {
                public void onClick(DialogInterface dialog, int which) {
                    dialog.cancel();
                }
            });
    alertDialog.show();
}

private class GeocoderHandler extends Handler {
    @Override
    public void handleMessage(Message message) {
        String locationAddress;
        switch (message.what) {
            case 1:
                Bundle bundle = message.getData();
                locationAddress = bundle.getString("address");
                break;
```

```
            default:
                locationAddress = null;
            }
            tvAddress.setText(locationAddress);
        }
    }
}
```

AppLocationService.java

```
package com.example.exp8;
import android.annotation.SuppressLint;
import android.app.Service;
import android.content.Context;
import android.content.Intent;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.os.Bundle;
import android.os.IBinder;

public class AppLocationService extends Service implements LocationListener {

    protected LocationManager locationManager;
    Location location;

    private static final long MIN_DISTANCE_FOR_UPDATE = 10;
    private static final long MIN_TIME_FOR_UPDATE = 1000 * 60 * 2;

    public AppLocationService(Context context) {
        locationManager = (LocationManager) context
                .getSystemService(LOCATION_SERVICE);
    }

    @SuppressLint("MissingPermission")
    public Location getLocation(String provider) {
        if (locationManager.isProviderEnabled(provider)) {
            locationManager.requestLocationUpdates(provider,
                    MIN_TIME_FOR_UPDATE, MIN_DISTANCE_FOR_UPDATE, this);
            if (locationManager != null) {
                location = locationManager.getLastKnownLocation(provider);
                return location;
            }
        }
        return null;
    }
    @Override
    public void onLocationChanged(Location location) {

    }

    @Override
    public void onStatusChanged(String s, int i, Bundle bundle) {

    }
```

```
    @Override
    public void onProviderEnabled(String s) {

    }

    @Override
    public void onProviderDisabled(String s) {

    }

    @Override
    public IBinder onBind(Intent intent) {
        return null;
    }
}
```

LocationAddress.java

```
package com.example.exp8;
import android.content.Context;
import android.location.Address;
import android.location.Geocoder;
import android.os.Bundle;
import android.os.Handler;
import android.os.Message;
import android.util.Log;

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

public class LocationAddress {
    private static final String TAG = "LocationAddress";

    public static void getAddressFromLocation(final double latitude, final double longitude,
                                              final Context context, final Handler handler) {
        Thread thread = new Thread() {
            @Override
            public void run() {
                Geocoder geocoder = new Geocoder(context, Locale.getDefault());
                String result = null;
                try {
                    List<Address> addressList = geocoder.getFromLocation(
                            latitude, longitude, 1);
                    if (addressList != null && addressList.size() > 0) {
                        Address address = addressList.get(0);
                        StringBuilder sb = new StringBuilder();
                        for (int i = 0; i < address.getMaxAddressLineIndex(); i++) {
                            sb.append(address.getAddressLine(i)).append("\n");
                        }
                        sb.append(address.getLocality()).append("\n");
                        sb.append(address.getPostalCode()).append("\n");
                        sb.append(address.getCountryName());
                        result = sb.toString();
                    }
                } catch (IOException e) {
                    Log.e(TAG, "Unable connect to Geocoder", e);
```

```
            } finally {
                Message message = Message.obtain();
                message.setTarget(handler);
                if (result != null) {
                    message.what = 1;
                    Bundle bundle = new Bundle();
                    result = "Latitude: " + latitude + " \nLongitude: " + longitude +
                            "\n\nAddress:\n" + result;
                    bundle.putString("address", result);
                    message.setData(bundle);
                } else {
                    message.what = 1;
                    Bundle bundle = new Bundle();
                    result = "Latitude: " + latitude + " \nLongitude: " + longitude +
                            "\n Unable to get address for this lat-long.";
                    bundle.putString("address", result);
                    message.setData(bundle);
                }
                message.sendToTarget();
            }
        }
    };
    thread.start();
  }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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=".MyActivity">

  <TextView
    android:text="EXPERIMENT 8"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/textView" />

  <Button
    style="?android:attr/buttonStyleSmall"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Show Location"
    android:layout_marginLeft="20dp"
    android:id="@+id/btnGPSShowLocation"
    android:layout_toEndOf="@+id/textView"
    android:layout_marginTop="53dp"
    android:layout_below="@+id/textView"
    android:layout_alignParentStart="true" />

  <Button
    android:layout_marginLeft="20dp"
```

```
        style="?android:attr/buttonStyleSmall"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Address"
        android:id="@+id/btnShowAddress"
        android:layout_toEndOf="@+id/tvAddress"
        android:layout_below="@+id/btnGPSShowLocation"
        android:layout_alignParentStart="true" />

    <TextView
        android:layout_marginLeft="20dp"
        android:textSize="20dp"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:id="@+id/tvAddress"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="134dp"
        android:layout_alignParentEnd="true" />
</RelativeLayout>
```

Output:-