Practical:11

AIM- Consider Android Application created in Practical-10 and add Sqlite feature such that it is storing data of persons which is received in JSON Format. There should be two buttons: after pressing first button then data of persons loads from sqlite database. After pressing second button, it receives data from network database in JSON format and loads data in ListView or RecyclerView.

1. Create MainActivity according to below UI design.
2. Follow steps and Copy codes from Practical-10
3. Create Class DatabaseHelper for Sqlite Database
4. Create class to store Companion Object for Sqlite database table name, column names.
5. Add some supported function in MainActivity for Sqlite database.
6. Add main_menu in menu folder of resource folder.
7. Add main_menu.xml file to toolbar of Activity as Option menu.
8. Add two buttons with vector icons.
9. Call appropriate method of mainactivity after pressing buttons of toolbar.

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Activity_main.xml :-

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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=".MainActivity"
    android:orientation="vertical"
    android:elevation="10dp">


    <com.google.android.material.appbar.AppBarLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <com.google.android.material.appbar.MaterialToolbar
            android:id="@+id/toolbar"
            android:layout_width="match_parent"
            android:layout_height="?attr/actionBarSize"
            app:menu="@menu/menu">
            <TextView
                android:layout_width="match_parent"
                android:layout_height="match_parent"
                android:text="@string/app_name"
                android:textSize="16sp"
                android:textStyle="bold"
                android:gravity="center_vertical"/>
        </com.google.android.material.appbar.MaterialToolbar>
    </com.google.android.material.appbar.AppBarLayout>

    <androidx.recyclerview.widget.RecyclerView
        android:id="@+id/recyclerView"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />


    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:elevation="20dp"
        android:layout_marginTop="-80dp"
        android:layout_marginRight="20dp"
        android:layout_gravity="end">
```

```
    <com.google.android.material.floatingactionbutton.FloatingActionButton
        android:id="@+id/btnSwap"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/baseline_autorenew_24"
        app:fabCustomSize="60dp"
        tools:ignore="SpeakableTextPresentCheck" />
  </LinearLayout>

</LinearLayout>
```

Activity_maps.xml :-

```
<?xml version="1.0" encoding="utf-8"?>
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/map"
  android:name="com.google.android.gms.maps.SupportMapFragment"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MapsActivity"
  tools:ignore="MissingClass" />
```

Contact_item.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="wrap_content"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  android:orientation="vertical">

  <com.google.android.material.card.MaterialCardView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    app:cardElevation="10dp"
    android:layout_margin="10dp"
    android:layout_gravity="center">

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

```
<ImageView
   android:id="@+id/imageView"
   android:layout_width="40dp"
   android:layout_height="40dp"
   android:layout_gravity="center"
   android:layout_margin="10dp"
   android:src="@drawable/baseline_person_24"
   android:background="@drawable/round_shape"/>


<LinearLayout
   android:layout_width="240dp"
   android:layout_height="wrap_content"
   android:orientation="vertical"
   android:layout_margin="5dp">
   <TextView
      android:id="@+id/name"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:textSize="16sp"
      android:textStyle="bold"
      android:text="Guerra Rodgers"/>

   <TextView
      android:id="@+id/mobile"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:textSize="14sp"
      android:text="+919289635723"/>

   <TextView
      android:id="@+id/emailid"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:textSize="14sp"
      android:text="guerra_rodgers@gnu.ac.in"/>

   <TextView
      android:id="@+id/address"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="88 College Place, Umapine, Oregon"
      android:textSize="14sp" />
</LinearLayout>

<LinearLayout
```

```
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical"
            android:gravity="center">
            <ImageView
               android:id="@+id/btnLocation"
               android:layout_width="40dp"
               android:layout_height="40dp"
               android:layout_gravity="center"
               android:layout_marginRight="10dp"
               android:layout_marginLeft="10dp"
               android:layout_marginBottom="5dp"
               android:background="@drawable/blue_round_shape"
               android:src="@drawable/baseline_location_on_24"/>

            <ImageView
               android:id="@+id/btnDelete"
               android:layout_width="40dp"
               android:layout_height="40dp"
               android:layout_gravity="center"
               android:layout_marginRight="10dp"
               android:layout_marginLeft="10dp"
               android:background="@drawable/red_round_shape"
               android:src="@drawable/baseline_delete_24"/>

         </LinearLayout>

      </LinearLayout>
   </com.google.android.material.card.MaterialCardView>
</LinearLayout>
```

Menu.xml :-

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto">

   <item
      android:id="@+id/sqliteDB"
      android:title="Button 1"
      app:showAsAction="always"
      android:icon="@drawable/baseline_window_24" />

   <item
```

```
    android:id="@+id/jsonDB"
    android:title="Button 2"
    app:showAsAction="always"
    android:icon="@drawable/baseline_autorenew_24" />
</menu>
```

MainActivity.kt :-

```
package com.example.mad_practical_11_21012011072

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.view.Menu
import android.view.MenuItem
import android.widget.Toast
import androidx.appcompat.widget.Toolbar
import androidx.recyclerview.widget.LinearLayoutManager
import androidx.recyclerview.widget.RecyclerView
import com.google.android.material.floatingactionbutton.FloatingActionButton
import kotlinx.coroutines.CoroutineScope
import kotlinx.coroutines.Dispatchers
import kotlinx.coroutines.launch
import kotlinx.coroutines.withContext
import org.json.JSONArray
import org.json.JSONException
import org.json.JSONObject

class MainActivity : AppCompatActivity() {
    lateinit var recyclerView : RecyclerView
    lateinit var databaseHelper: DatabaseHelper
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)

        databaseHelper = DatabaseHelper(this)
        val toolBar : Toolbar = findViewById(R.id.toolbar)

        setSupportActionBar(toolBar)

        val fetchBtn : FloatingActionButton = findViewById(R.id.btnSwap)

        recyclerView = findViewById(R.id.recyclerView)
        fetchBtn.setOnClickListener {
            CoroutineScope(Dispatchers.IO).launch {
                try {
```

```
                val data = HttpRequest().makeServiceCall(
                    "https://api.json-generator.com/templates/qjeKFdjkXCdK/data",
                    "rbn0rerl1k0d3mcwgw7dva2xuwk780z1hxvyvrb1"
                )
                withContext(Dispatchers.Main) {
                    try {
                        if(data != null)
                        {
                            runOnUiThread{getPersonDetailsFromJson(data)}
                        }
                    }
                    catch (e: Exception)
                    {
                        e.printStackTrace()
                    }
                }
            }
            catch (e: Exception)
            {
                e.printStackTrace()
            }
        }
    }
}

override fun onCreateOptionsMenu(menu: Menu): Boolean {
    menuInflater.inflate(R.menu.menu, menu)
    return true
}

override fun onOptionsItemSelected(item: MenuItem): Boolean {
    when (item.itemId) {
        R.id.sqliteDB -> {
            Toast.makeText(this@MainActivity, "Clicked on item at menu!",
Toast.LENGTH_SHORT).show()
            return true
        }
        R.id.jsonDB -> {
            val personList: ArrayList<Person> = databaseHelper.getAllPersons()
            recyclerView.layoutManager = LinearLayoutManager(this)
            recyclerView.adapter = PersonAdapter(this, personList)
            return true
        }
        else -> return super.onOptionsItemSelected(item)
    }
}
```

```
    private fun getPersonDetailsFromJson(sJson: String?)
    {
        val personList = ArrayList<Person>()
        try {
            val jsonArray = JSONArray(sJson)
            for(i in 0 until jsonArray.length())
            {
                val jsonObject = jsonArray[i] as JSONObject
                val person = Person(jsonObject)
                personList.add(person)
            }
            recyclerView.layoutManager = LinearLayoutManager(this)
            recyclerView.adapter = PersonAdapter(this, personList)
        }
        catch (e: JSONException)
        {
            e.printStackTrace()
        }
    }
}
```

MapsActivity.kt :-

```
package com.example.mad_practical_11_21012011072

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.util.Log
import com.example.mad_practical_11_21012011072.databinding.ActivityMapsBinding

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

class MapsActivity : AppCompatActivity(), OnMapReadyCallback {

    private lateinit var mMap: GoogleMap
    private lateinit var binding: ActivityMapsBinding

    private val TAG = "MapActivity"
    private var lat = -34.0
    private var log = 151.0
    private var title = "Marker in Sydney"
```

```
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)

        val obj = intent.getSerializableExtra("Object") as Person
        Log.i(TAG, "onCreate: Object:$obj")
        lat = obj.latitude
        log = obj.longitude
        title = obj.name

        binding = ActivityMapsBinding.inflate(layoutInflater)
        setContentView(binding.root)

        // Obtain the SupportMapFragment and get notified when the map is ready to be used.
        val mapFragment = supportFragmentManager
            .findFragmentById(R.id.map) as SupportMapFragment
        mapFragment.getMapAsync(this)
    }

    /**
     * Manipulates the map once available.
     * This callback is triggered when the map is ready to be used.
     * This is where we can add markers or lines, add listeners or move the camera. In this case,
     * we just add a marker near Sydney, Australia.
     * If Google Play services is not installed on the device, the user will be prompted to install
     * it inside the SupportMapFragment. This method will only be triggered once the user has
     * installed Google Play services and returned to the app.
     */
    override fun onMapReady(googleMap: GoogleMap) {
        mMap = googleMap

        // Add a marker in Sydney and move the camera
        val sydney = LatLng(lat, log)
        mMap.addMarker(MarkerOptions().position(sydney).title(title))
//        mMap.moveCamera(CameraUpdateFactory.newLatLng(sydney))
        mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(sydney, 8.0f))
    }
}
```

Person.kt :-

```
package com.example.mad_practical_11_21012011072

import org.json.JSONObject
import java.io.Serializable
```

```
class Person (var id: String,
              var name: String,
              var emailId: String,
              var phoneNo: String,
              var address: String,
              var latitude: Double,
              var longitude: Double):Serializable{
    constructor(jsonObject: JSONObject):this("","","","","",0.0,0.0) {
        id = jsonObject.getString("id")
        emailId = jsonObject.getString("email")
        phoneNo = jsonObject.getString("phone")
        val profileJson = jsonObject.getJSONObject("profile")
        name = profileJson.getString("name")
        address = profileJson.getString("address")
        val locationJson = profileJson.getJSONObject("location")
        latitude = locationJson.getDouble("lat")
        longitude = locationJson.getDouble("long")
    }
}
```

HttpRequest.kt :-

```
package com.example.mad_practical_11_21012011072

import android.util.Log
import java.io.BufferedInputStream
import java.io.BufferedReader
import java.io.IOException
import java.io.InputStream
import java.io.InputStreamReader
import java.lang.Exception
import java.lang.StringBuilder
import java.net.HttpURLConnection
import java.net.MalformedURLException
import java.net.ProtocolException
import java.net.URL

class HttpRequest {
    private val TAG = "HttpRequest"

    fun makeServiceCall(reqUrl: String?, token: String?=null): String? {
        var response: String? = null
```

```
    try {
        val url = URL(reqUrl)
        val conn = url.openConnection() as HttpURLConnection
        if (token != null)
        {
            conn.setRequestProperty("Authorization","Bearer $token")
            conn.setRequestProperty("Content-Type","application/json")
        }
        conn.requestMethod = "GET"
        response = convertStreamToString(BufferedInputStream(conn.inputStream))
    }
    catch (e : MalformedURLException)
    {
        Log.e(TAG, "MalformedURLException: " + e.message)
    }
    catch (e : ProtocolException)
    {
        Log.e(TAG, "ProtocolException: " + e.message)
    }
    catch (e : IOException)
    {
        Log.e(TAG, "IOException: " + e.message)
    }
    catch (e: Exception)
    {
        Log.e(TAG, "Exception: " + e.message)
    }
    return response
}

private fun convertStreamToString(`is`: InputStream):String
{
    val reader = BufferedReader(InputStreamReader(`is`))
    val sb = StringBuilder()
    var line: String?=null
    try {
        while (reader.readLine().also { line = it } != null)
        {
            sb.append(line).append('\n')
        }
    }
    catch (e : IOException)
    {
        Log.i(TAG, "convertStreamToString: $line")
        e.printStackTrace()
    }
    finally {
```

```
            try {
                `is`.close()
            }
            catch (e: IOException)
            {
                e.printStackTrace()
            }
        }
        return sb.toString()
    }
}
```

PersonAdapter.kt :-

```
package com.example.mad_practical_11_21012011072

import android.annotation.SuppressLint
import android.content.Context
import android.content.Intent
import android.view.LayoutInflater
import android.view.View
import android.view.ViewGroup
import android.widget.ImageView
import android.widget.TextView
import android.widget.Toast
import androidx.recyclerview.widget.RecyclerView
import java.io.Serializable
class PersonAdapter(private val context: Context, private val array: ArrayList<Person>):
    RecyclerView.Adapter<PersonAdapter.PersonViewHolder>(){
    lateinit var databaseHelper: DatabaseHelper
    init {
        // Initialize the databaseHelper here
        databaseHelper = DatabaseHelper(context)
    }
    inner class PersonViewHolder(val itemView: View): RecyclerView.ViewHolder(itemView)
    {
        val nameTxt : TextView = itemView.findViewById(R.id.name)
        val emailTxt : TextView = itemView.findViewById(R.id.emailid)
        val phoneTxt : TextView = itemView.findViewById(R.id.mobile)
        val addressTxt : TextView = itemView.findViewById(R.id.address)
        val mapBtn : ImageView = itemView.findViewById(R.id.btnLocation)
        val deleteBtn : ImageView = itemView.findViewById(R.id.btnDelete)
    }
    override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): PersonViewHolder {
        val view = LayoutInflater.from(parent.context).inflate(R.layout.contact_item, parent, false)
```

```
        return PersonViewHolder(view)
    }
    override fun getItemCount(): Int {
        return array.size
    }
    @SuppressLint("NotifyDataSetChanged")
    override fun onBindViewHolder(holder: PersonViewHolder, position: Int) {
        val person = array[position]
        holder.nameTxt.text = person.name
        holder.emailTxt.text = person.emailId
        holder.phoneTxt.text = person.phoneNo
        holder.addressTxt.text = person.address
        val obj = person as Serializable
        databaseHelper.insertPerson(person)
        holder.mapBtn.setOnClickListener {
            Intent(this@PersonAdapter.context, MapsActivity::class.java).apply {
                putExtra("Object",obj)
                this@PersonAdapter.context.startActivity(this)
            }
        }
        holder.deleteBtn.setOnClickListener {
            val count = databaseHelper.deletePerson(person.id)
            if(count > 0)
            {
                Toast.makeText(this.context, "${person.name}'s details deleted successfully!",
                    Toast.LENGTH_SHORT).show()
                array.removeAt(position)
                notifyDataSetChanged()
            }
        }
    }
}
```

DatabaseHelper.kt :-

```
package com.example.mad_practical_11_21012011072

import android.annotation.SuppressLint
import android.content.ContentValues
import android.content.Context
import android.database.Cursor
import android.database.sqlite.SQLiteDatabase
import android.database.sqlite.SQLiteOpenHelper
import org.json.JSONObject
```

```
class DatabaseHelper(context: Context): SQLiteOpenHelper(context, DATABASE_NAME, null,
   DATABASE_VERSION){
   companion object{
      private const val DATABASE_VERSION = 1
      private const val DATABASE_NAME = "persons.db"
      private const val TABLE_NAME = "person"
      private const val COLUMN_ID = "id"
      private const val COLUMN_PERSON_NAME = "person_name"
      private const val COLUMN_PERSON_EMAIL_ID = "person_email_id"
      private const val COLUMN_PERSON_PHONE_NO = "person_phone_no"
      private const val COLUMN_PERSON_ADDRESS = "person_address"
      private const val COLUMN_PERSON_GPS_LAT = "person_lat"
      private const val COLUMN_PERSON_GPS_LONG = "person_long"
   }
   override fun onCreate(db: SQLiteDatabase?) {
      val CREATE_TABLE = ("CREATE TABLE " + TABLE_NAME + "("
            + COLUMN_ID + " TEXT PRIMARY KEY,"
            + COLUMN_PERSON_NAME + " TEXT,"
            + COLUMN_PERSON_EMAIL_ID + " TEXT,"
            + COLUMN_PERSON_PHONE_NO + " TEXT,"
            + COLUMN_PERSON_ADDRESS + " TEXT,"
            + COLUMN_PERSON_GPS_LAT + " REAL,"
            + COLUMN_PERSON_GPS_LONG + " REAL)")

      if (db != null) {
         db.execSQL(CREATE_TABLE)
      }
   }
   override fun onUpgrade(db: SQLiteDatabase?, oldVersion: Int, newVersion: Int) {
      if (db != null) {
         db.execSQL("DROP TABLE IF EXISTS $TABLE_NAME")
      }
   }
   fun insertPerson(person: Person) : Long
   {
      val db =writableDatabase
      val contentValues = ContentValues()
      contentValues.put(COLUMN_ID,person.id)
      contentValues.put(COLUMN_PERSON_NAME,person.name)
      contentValues.put(COLUMN_PERSON_EMAIL_ID,person.emailId)
      contentValues.put(COLUMN_PERSON_PHONE_NO,person.phoneNo)
      contentValues.put(COLUMN_PERSON_ADDRESS,person.address)
      contentValues.put(COLUMN_PERSON_GPS_LAT,person.latitude)
      contentValues.put(COLUMN_PERSON_GPS_LONG,person.longitude)
      val count = db.insert(TABLE_NAME, null, contentValues)
      db.close()
      return count
```

```
    }
    fun deletePerson(personId: String) : Int
    {
        val db = writableDatabase
        val selection ="$COLUMN_ID = ?"
        val selectionArgs = arrayOf(personId)
        val count =db.delete(TABLE_NAME,selection,selectionArgs)
        db.close()
        return count
    }
    @SuppressLint("Range")
    fun getAllPersons() :ArrayList<Person>
    {
        val personList = arrayListOf<Person>()
        val db =readableDatabase
        var query = "SELECT * FROM $TABLE_NAME"
        var cursor : Cursor =db.rawQuery(query,null)
        while (cursor.moveToNext())
        {
            var id : String = cursor.getString(cursor.getColumnIndex(COLUMN_ID))
            var name : String = cursor.getString(cursor.getColumnIndex(COLUMN_PERSON_NAME))
            var email : String = cursor.getString(cursor.getColumnIndex(COLUMN_PERSON_EMAIL_ID))
            var phone : String =
cursor.getString(cursor.getColumnIndex(COLUMN_PERSON_PHONE_NO))
            var address: String =
cursor.getString(cursor.getColumnIndex(COLUMN_PERSON_ADDRESS))

            var latitude : Double =
                cursor.getDouble(cursor.getColumnIndex(COLUMN_PERSON_GPS_LAT))
            var longitude: Double =
                cursor.getDouble(cursor.getColumnIndex(COLUMN_PERSON_GPS_LONG))
            val jsonObject = JSONObject()
            jsonObject.put("id", id)
            jsonObject.put("email", email)
            jsonObject.put("phone", phone)
            val profileJson = JSONObject()
            profileJson.put("name", name) // You'll need to fill in the actual name value here
            profileJson.put("address", address)
            val locationJson = JSONObject()
            locationJson.put("lat", latitude)
            locationJson.put("long", longitude)
            profileJson.put("location", locationJson)
            jsonObject.put("profile", profileJson)
            val person = Person(jsonObject)
            personList.add(person)
        }
        cursor.close()
```

```
        db.close()
        return personList
    }
}
```

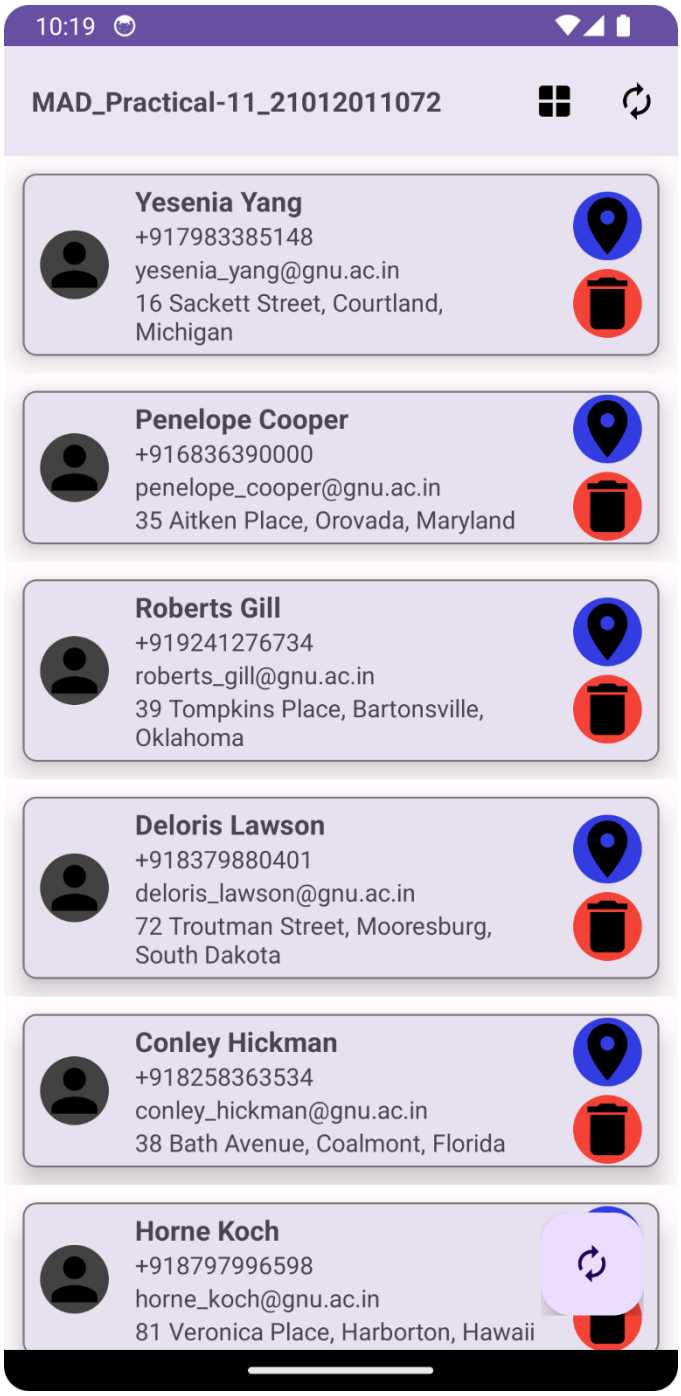
PersonDBTableData.kt :-

```
package com.example.mad_practical_11_21012011072

class PersonDBTableData {
    companion object {
        const val TABLE_NAME = "persons"
        const val COLUMN_ID = "id"
        const val COLUMN_PERSON_NAME = "person_name"
        const val COLUMN_PERSON_EMAIL_ID = "person_email_id"
        const val COLUMN_PERSON_PHONE_NO = "person_phone_no"
        const val COLUMN_PERSON_ADDRESS = "person_address"
        const val COLUMN_PERSON_GPS_LAT = "person_lat"
        const val COLUMN_PERSON_GPS_LONG = "person_long"

        val CREATE_TABLE = ("CREATE TABLE "+ TABLE_NAME + "("
                + COLUMN_ID + " TEXT PRIMARY KEY,"
                + COLUMN_PERSON_NAME + " TEXT,"
                + COLUMN_PERSON_EMAIL_ID + " TEXT,"
                + COLUMN_PERSON_PHONE_NO + " TEXT,"
                + COLUMN_PERSON_ADDRESS + " TEXT,"
                + COLUMN_PERSON_GPS_LAT + " REAL,"
                + COLUMN_PERSON_GPS_LONG + " REAL"
                + ")")
    }
}
```

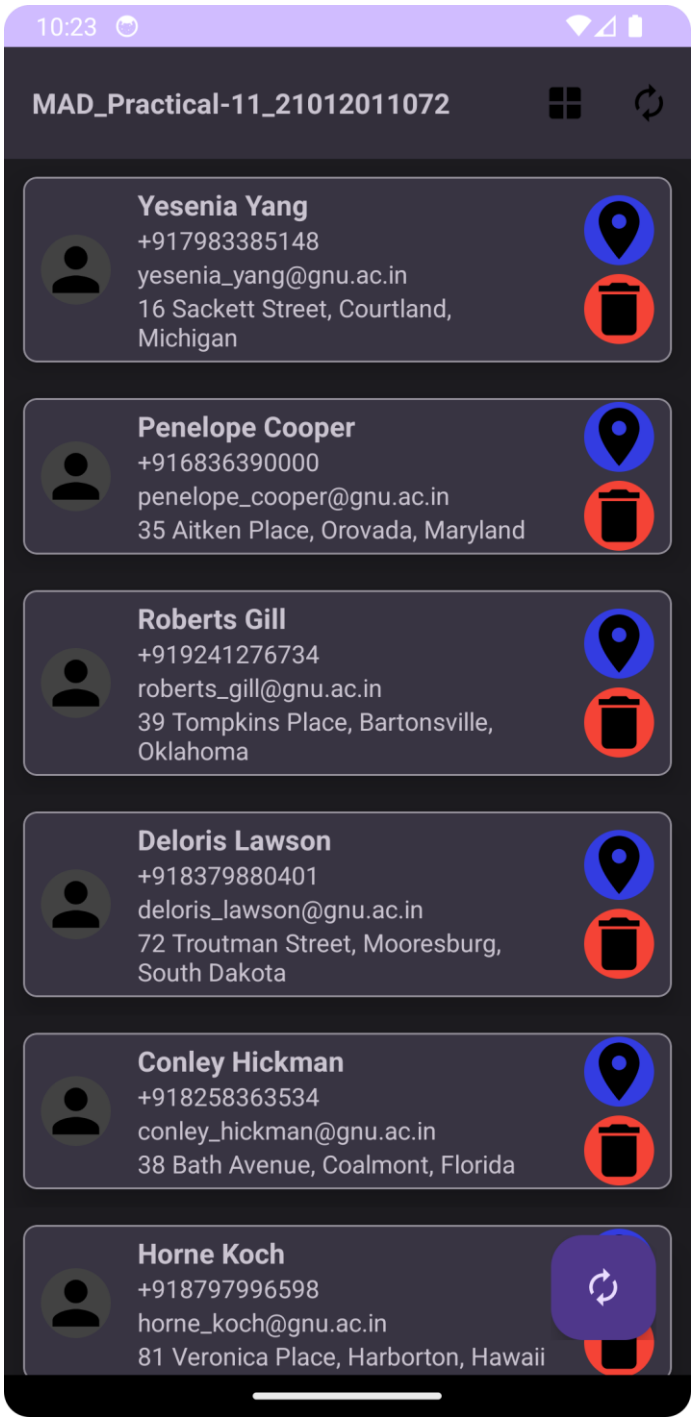
AndroidManifest.xml :-

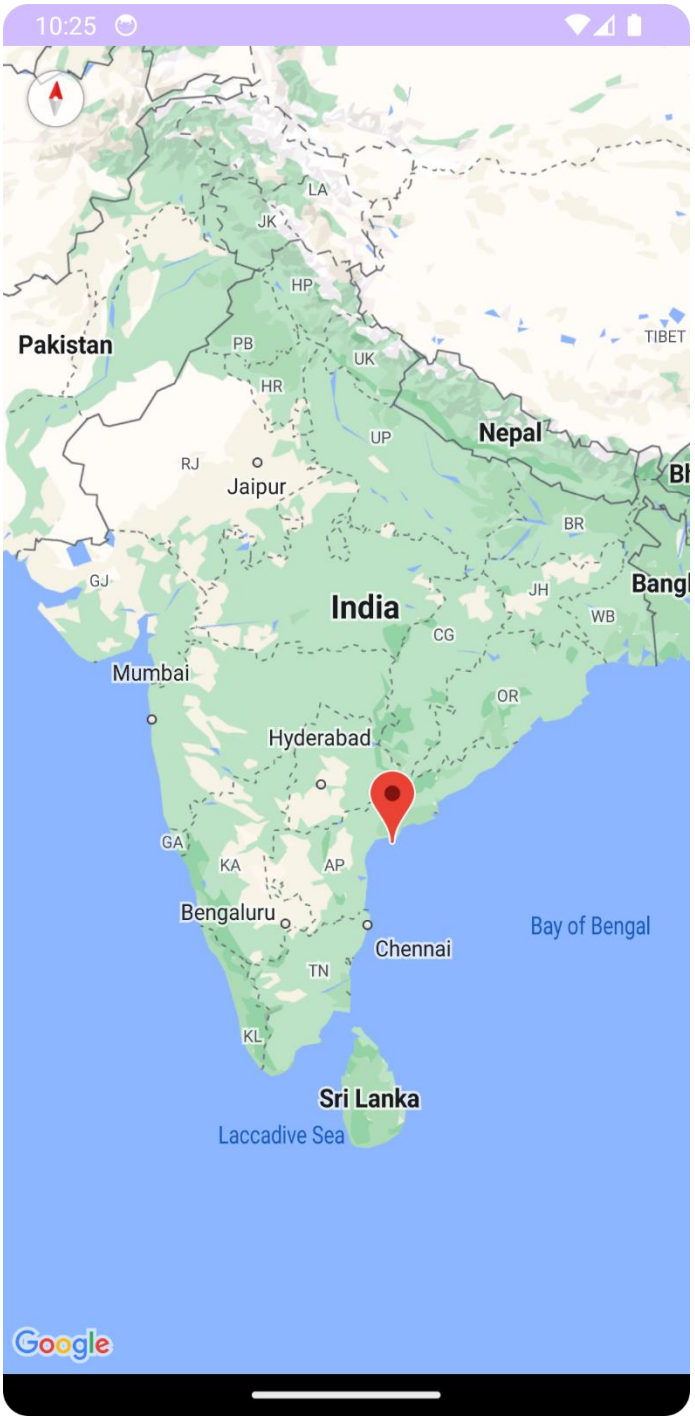
```
<meta-data
    android:name="com.google.android.geo.API_KEY"
    android:value="AIzaSyBVgO1713xHQ9FVaLQiV1Pp0AiA3ndOckw" />
```

Output :-



LIGHT THEME


10:23
MAD_Practical-11_21012011072
Yesenia Yang
+917983385148
yesenia_yang@gnu.ac.in
16 Sackett Street, Courtland, Michigan
Penelope Cooper
+916836390000
penelope_cooper@gnu.ac.in
35 Aitken Place, Orovada, Maryland
Roberts Gill
+919241276734
roberts_gill@gnu.ac.in
39 Tompkins Place, Bartonsville, Oklahoma
Deloris Lawson
+918379880401
deloris_lawson@gnu.ac.in
72 Troutman Street, Mooresburg, South Dakota
Conley Hickman
+918258363534
conley_hickman@gnu.ac.in
38 Bath Avenue, Coalmont, Florida
Horne Koch
+918797996598
horne_koch@gnu.ac.in
81 Veronica Place, Harborton, Hawaii


10:25
Pakistan
Nepal
India
Jaipur
Mumbai
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Chennai
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