Q3. You will be persisting data using an SQLite Database and preserving the state of an application during its lifecycle.
a. How to save & restore data as Application Preferences (Shared Preference).
b. How to save & restore data as Instance State.
c.How to create and manage an SQLiteDatabase in Android.
d. How to insert, update, remove, and retrieve data from an SQLite Database.
e. Display data using RecyclerView.

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"
    android:padding="10dp"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/texttitle"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Please enter the details below"
        android:textSize="24dp"
        android:layout_marginTop="20dp"/>

    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/texttitle"
        android:hint="Name"
        android:inputType="textPersonName"
        android:textSize="24dp" />

    <EditText
        android:id="@+id/contact"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/name"
        android:hint="Contact"
        android:inputType="number"
        android:textSize="24dp" />

    <EditText
        android:id="@+id/dob"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/contact"
        android:hint="Date of Birth"
        android:inputType="number"
        android:textSize="24dp" />

    <Button
        android:id="@+id/btnInsert"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/dob"
        android:layout_marginTop="30dp"
        android:text="Insert New Data"
        android:textSize="24dp" />

    <Button
        android:id="@+id/btnUpdate"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/btnInsert"
        android:text="Update Data"
        android:textSize="24dp" />

    <Button
        android:id="@+id/btnDelete"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/btnUpdate"
        android:text="Delete Existing Data"
        android:textSize="24dp" />

    <Button
        android:id="@+id/btnView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/btnDelete"
        android:text="View Data"
        android:textSize="24dp" />
</RelativeLayout>
```

MainActivity.java

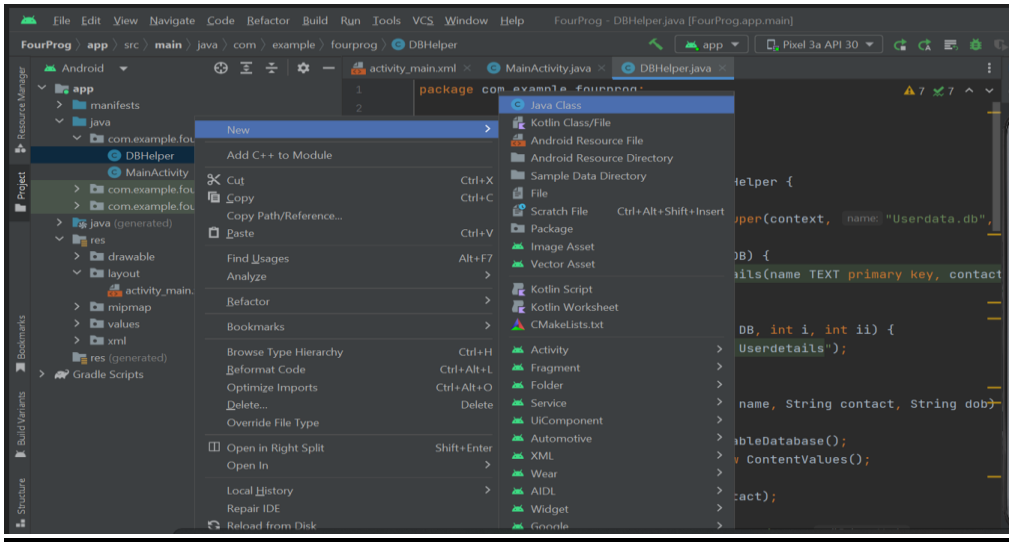
```
package com.example.fourprog;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;

import android.database.Cursor;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
   EditText name, contact, dob;
   Button insert, update, delete, view;
   DBHelper DB;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      name = findViewById(R.id.name);
      contact = findViewById(R.id.contact);
      dob = findViewById(R.id.dob);
      insert = findViewById(R.id.btnInsert);
      update = findViewById(R.id.btnUpdate);
      delete = findViewById(R.id.btnDelete);
      view = findViewById(R.id.btnView);
      DB = new DBHelper(this);
      insert.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
            String nameTXT = name.getText().toString();
            String contactTXT = contact.getText().toString();
            String dobTXT = dob.getText().toString();

            Boolean checkinsertdata = DB.insertuserdata(nameTXT, contactTXT, dobTXT);
            if(checkinsertdata==true)
               Toast.makeText(MainActivity.this, "New Entry Inserted",
Toast.LENGTH_SHORT).show();
            else
               Toast.makeText(MainActivity.this, "New Entry Not Inserted",
Toast.LENGTH_SHORT).show();
         }       });
```

```
        update.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String nameTXT = name.getText().toString();
                String contactTXT = contact.getText().toString();
                String dobTXT = dob.getText().toString();

                Boolean checkupdatedata = DB.updateuserdata(nameTXT, contactTXT, dobTXT);
                if(checkupdatedata==true)
                    Toast.makeText(MainActivity.this, "Entry Updated",
Toast.LENGTH_SHORT).show();
                else
                    Toast.makeText(MainActivity.this, "New Entry Not Updated",
Toast.LENGTH_SHORT).show();
            }       });

        delete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String nameTXT = name.getText().toString();
                Boolean checkudeletedata = DB.deletedata(nameTXT);
                if(checkudeletedata==true)
                    Toast.makeText(MainActivity.this, "Entry Deleted",
Toast.LENGTH_SHORT).show();
                else
                    Toast.makeText(MainActivity.this, "Entry Not Deleted",
Toast.LENGTH_SHORT).show();
            }       });

        view.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Cursor res = DB.getdata();
                if(res.getCount()==0){
                    Toast.makeText(MainActivity.this, "No Entry Exists",
Toast.LENGTH_SHORT).show();
                    return;
                }
                StringBuffer buffer = new StringBuffer();
                while(res.moveToNext()){
                    buffer.append("Name :"+res.getString(0)+"\n");
                    buffer.append("Contact :"+res.getString(1)+"\n");
                    buffer.append("Date of Birth :"+res.getString(2)+"\n\n");
                }

                AlertDialog.Builder builder = new AlertDialog.Builder(MainActivity.this);
```

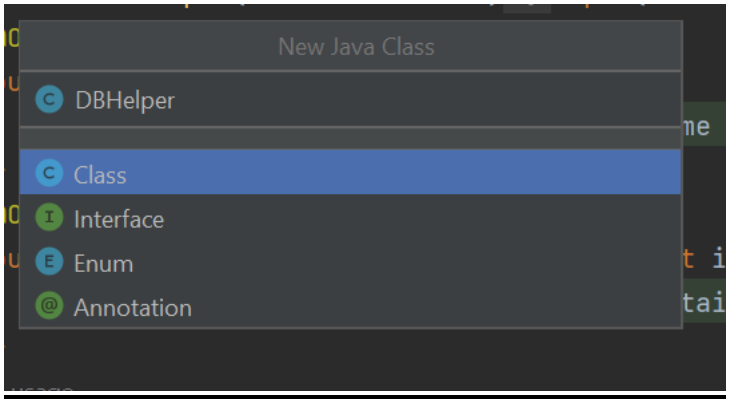
```
            builder.setCancelable(true);
            builder.setTitle("User Entries");
            builder.setMessage(buffer.toString());
            builder.show();
        }       });
    }}
```

DBHelper.java

Right-click ->New->Java Class



Click on Java Class



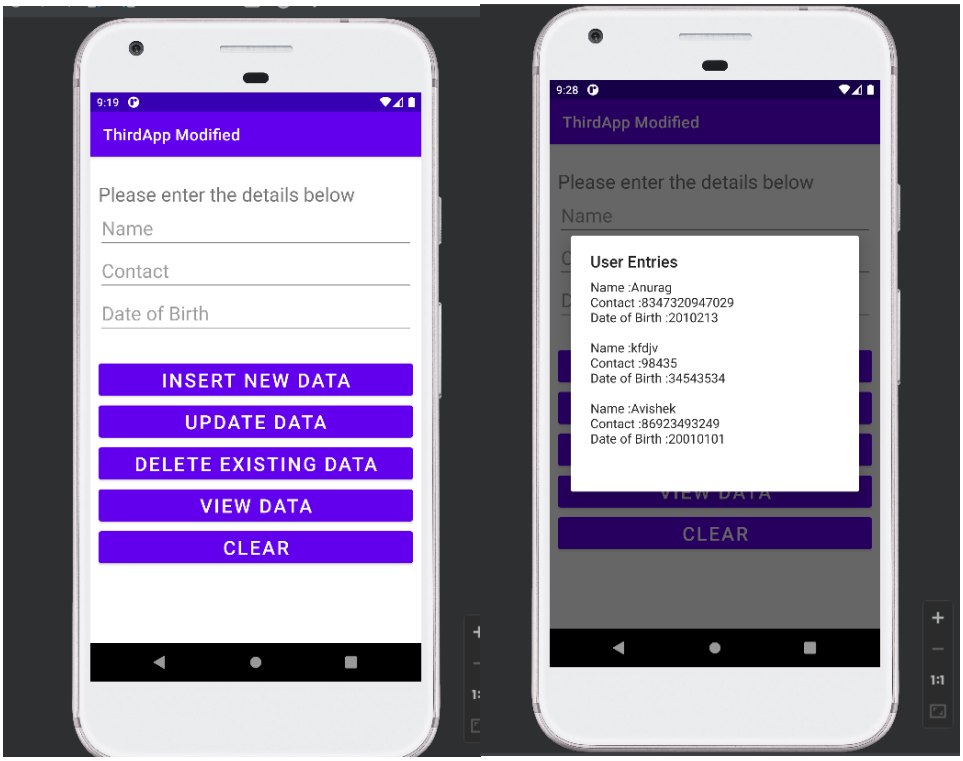
Give the name as DBHelper and create class

Code:

```
package com.example.fourprog;

import android.content.ContentValues;
      import android.content.Context;
      import android.database.Cursor;
      import android.database.sqlite.SQLiteDatabase;
      import android.database.sqlite.SQLiteOpenHelper;
      import androidx.annotation.Nullable;

public class DBHelper extends SQLiteOpenHelper {
   public DBHelper(Context context) {
      super(context, "Userdata.db", null, 1);
   }
   @Override
   public void onCreate(SQLiteDatabase DB) {
      DB.execSQL("create Table Userdetails(name TEXT primary key, contact TEXT, dob
TEXT)");
   }
   @Override
   public void onUpgrade(SQLiteDatabase DB, int i, int ii) {
      DB.execSQL("drop Table if exists Userdetails");
   }
   public Boolean insertuserdata(String name, String contact, String dob)
   {
      SQLiteDatabase DB = this.getWritableDatabase();
      ContentValues contentValues = new ContentValues();
      contentValues.put("name", name);
      contentValues.put("contact", contact);
      contentValues.put("dob", dob);
      long result=DB.insert("Userdetails", null, contentValues);
      if(result==-1){
         return false;
      }else{
         return true;
      }
   }
   public Boolean updateuserdata(String name, String contact, String dob)
   {
      SQLiteDatabase DB = this.getWritableDatabase();
      ContentValues contentValues = new ContentValues();
      contentValues.put("contact", contact);
      contentValues.put("dob", dob);
      Cursor cursor = DB.rawQuery("Select * from Userdetails where name = ?", new
String[]{name});
```

```
        if (cursor.getCount() > 0) {
            long result = DB.update("Userdetails", contentValues, "name=?", new
String[]{name});
            if (result == -1) {
                return false;
            } else {
                return true;
            }
        } else {
            return false;
        }
    }
    public Boolean deletedata (String name)
    {
        SQLiteDatabase DB = this.getWritableDatabase();
        Cursor cursor = DB.rawQuery("Select * from Userdetails where name = ?", new
String[]{name});
        if (cursor.getCount() > 0) {
            long result = DB.delete("Userdetails", "name=?", new String[]{name});
            if (result == -1) {
                return false;
            } else {
                return true;
            }
        } else {
            return false;
        }
    }

    public Cursor getdata ()
    {
        SQLiteDatabase DB = this.getWritableDatabase();
        Cursor cursor = DB.rawQuery("Select * from Userdetails", null);
        return cursor;
    }
}
```

Output:


9:19
ThirdApp Modified
Please enter the details below
Name
Contact
Date of Birth
INSERT NEW DATA
UPDATE DATA
DELETE EXISTING DATA
VIEW DATA
CLEAR
9:28
ThirdApp Modified
Please enter the details below
Name
User Entries
Name :Anurag
Contact :8347320947029
Date of Birth :2010213
Name :kfdjv
Contact :98435
Date of Birth :34543534
Name :Avishek
Contact :86923493249
Date of Birth :20010101
CLEAR