20MCA243 – Mobile Application Development Lab

Lab Report Submitted By

DEEPENDRA M B

AJC22MCA-2037

In Partial Fulfilment for the Award of the Degree Of

MASTER OF COMPUTER APPLICATIONS
(MCA TWO YEAR)
[Accredited by NBA]

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

[Affiliated to APJ Abdul Kalam Technological University, Kerala. Approved by AICTE, Accredited by NAAC. Koovappally, Kanjirappally, Kottayam, Kerala – 686518]

2022-2024

DEPARTMENT OF COMPUTER APPLICATIONS

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

CERTIFICATE

This is to certify that the lab report, "**20MCA243 – Mobile Application Development Lab"** is the bonafide work of **DEEPENDRA M B (AJC22MCA-2037)** in partial fulfilment of the requirements for the award of the Degree of Master of Computer Applications under APJ Abdul Kalam Technological University during the year **2023-24.**

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Course Code	Course Name	Syllabus Year	L-T-P-C
20MCA243	Mobile Application Development Lab	2020	0-1-3-2

VISION

To promote an academic and research environment conducive for innovation centric technical education.

MISSION

MS1 - Provide foundations and advanced technical education in both theoretical and applied Computer Applications in-line with Industry demands.

MS2 - Create highly skilled computer professionals capable of designing and innovating real life solutions.

MS3 - Sustain an academic environment conducive to research and teaching focused to generate up-skilled professionals with ethical values.

MS4 - Promote entrepreneurial initiatives and innovations capable of bridging and contributing with sustainable, socially relevant technology solutions.

COURSE OUTCOME

CO	Outcome	Target
CO1	Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator	60.1
CO2	Write simple programs and develop small applications using the concepts of UI design, layouts and preferences	60.1
CO3	Develop applications with multiple activities using intents, array adapter, exceptions and options menu.	60.1
CO4	Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes	60.1
CO5	Develop mobile applications using SQLite.	60.1

COURSE END SURVEY

CO	Survey Question	Answer Format
CO1	To what extent you are able to design and develop UI using Emulator	Excellent/Very Good/Good Satisfactory/Needs improvement
CO2	To what extent you understood concepts of layouts	Excellent/Very Good/Good Satisfactory/Needs improvement
CO3	To what extent you understood intents, exceptions and menus	Excellent/Very Good/Good Satisfactory/Needs improvement
CO4	To what extent you are able to implement activities applying themes	Excellent/Very Good/Good Satisfactory/Needs improvement
CO5	To what extent you understood to create applications with SQLite	Excellent/Very Good/Good Satisfactory/Needs improvement

CONTENT

Experiment No. 1

Aim: Design a Login Form with username and password using LinearLayout and toast valid Credentials

CO1: Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator

Procedure:

activity_main.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="match_parent"
   android:orientation="vertical"
   android:padding="16dp">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="LOGIN FORM"
      android:textAlignment="center" />
   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="USERNAME" />
   <EditText
      android:id="@+id/usernameEditText"
```

```
        android:layout_width="213dp"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:hint="Enter username" />
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="PASSWORD"
        android:layout_marginTop="16dp"/>
    <EditText
        android:id="@+id/passwordEditText"
        android:layout_width="215dp"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:hint="Enter password" />
    <Button
        android:id="@+id/loginButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Login" />
</LinearLayout>
```

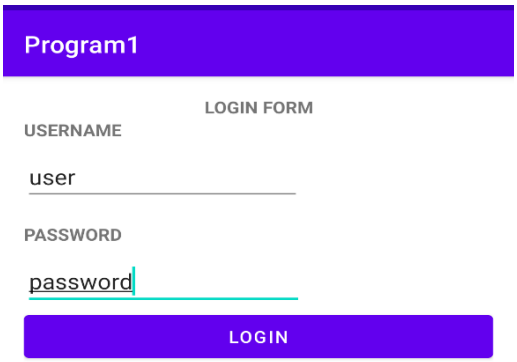
Main.activity.java

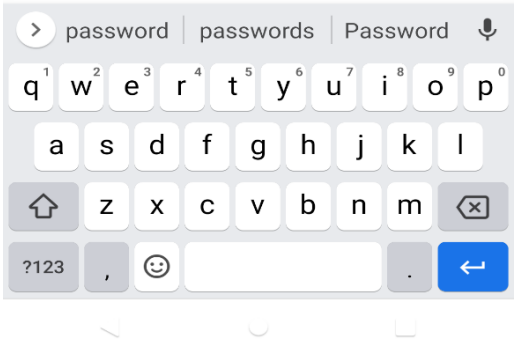
```
package com.example.firstapp;
import android.os.Bundle;
import android.view.View;
```

```
import android.widget.EditText;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    private static final String VALID_USERNAME="user";
    private static final String VALID_PASSWORD="password";
    private EditText usernameEditText;
    private EditText passwordEditText;
    private Button loginButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        usernameEditText=findViewById(R.id.usernameEditText);
        passwordEditText=findViewById(R.id.passwordEditText);
        loginButton=findViewById(R.id.loginButton);
        loginButton.setOnClickListener(v -> {
            String enteredUsername=usernameEditText.getText().toString();
            String  enteredPassword=passwordEditText.getText().toString();
            if(isValidCredentials(enteredUsername,enteredPassword)) {
                showToast("Login Successful");
            }
            else{
                showToast("Invalid Credentials");
            }
        });}
```

```
    private boolean isValidCredentials(String enteredUsername, String enteredPassword){
        return VALID_USERNAME.equals(enteredUsername) &&
VALID_PASSWORD.equals(enteredPassword);
    }
    private void showToast(String message){
        Toast.makeText(this,message,Toast.LENGTH_SHORT).show();
    }
}
```

Output:





Result : The program was executed successfully and the output was obtained. Thus, CO1 has beenattained.

Experiment No. 2

Aim: Implementing basic arithmetic operations of a simple calculator

CO1: Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator.

CO2: Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

Procedure:

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"
   android:orientation="vertical"
   android:padding="30dp"
   android:gravity="center_horizontal">
   <!-- Text View -->
   <TextView
      android:id="@+id/TextView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Simple Calculator"
      android:textColor="@color/black"
      android:textSize="24sp"
      android:layout_gravity="center"
      android:layout_marginBottom="16dp"
      android:textStyle="bold"/>
```

```
<!-- Edit Text-->
<EditText
    android:id="@+id/EditText1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="30dp"
    android:layout_marginStart="50dp"
    android:layout_marginTop="50dp"
    android:layout_marginEnd="50dp"
    android:layout_marginBottom="50dp" />
<GridLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:rowCount="4"
    android:columnCount="4"
    android:layout_gravity="center"
    android:layout_marginTop="40dp">
    <Button
        android:id="@+id/button1"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="1"
        android:textSize="18sp"
        android:onClick="onDigitClick"/>
    <Button
        android:id="@+id/button2"
```

```
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="2"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button3"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="3"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/buttonDiv"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="/"
    android:textSize="18sp"
    android:onClick="onOperatorClick"/>
<Button
    android:id="@+id/button4"
    android:layout_width="0dp"
```

```
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="4"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button5"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="5"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button6"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="6"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/buttonMul"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
```

```
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="*"
        android:textSize="18sp"
        android:onClick="onOperatorClick"/>
    <Button
        android:id="@+id/button7"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="7"
        android:textSize="18sp"
        android:onClick="onDigitClick"/>
    <Button
        android:id="@+id/button8"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="8"
        android:textSize="18sp"
        android:onClick="onDigitClick"/>
    <Button
        android:id="@+id/button9"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
```

```
    android:layout_columnWeight="1"
    android:text="9"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/buttonSub"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="-"
    android:textSize="18sp"
    android:onClick="onOperatorClick"/>
<Button
    android:id="@+id/button0"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="0"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/buttonDot"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
```

```
        android:text="C"
        android:textSize="18sp"
        android:onClick="onClearClick"/>

    <Button
        android:id="@+id/buttonEqual"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="="
        android:textSize="18sp"
        android:onClick="onEqualsClick"/>

    <Button
        android:id="@+id/buttonAdd"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        style="?android:attr/buttonStyleSmall"
        android:layout_columnWeight="1"
        android:text="+"
        android:textSize="18sp"
        android:onClick="onOperatorClick"/>
  </GridLayout>
</LinearLayout>
```

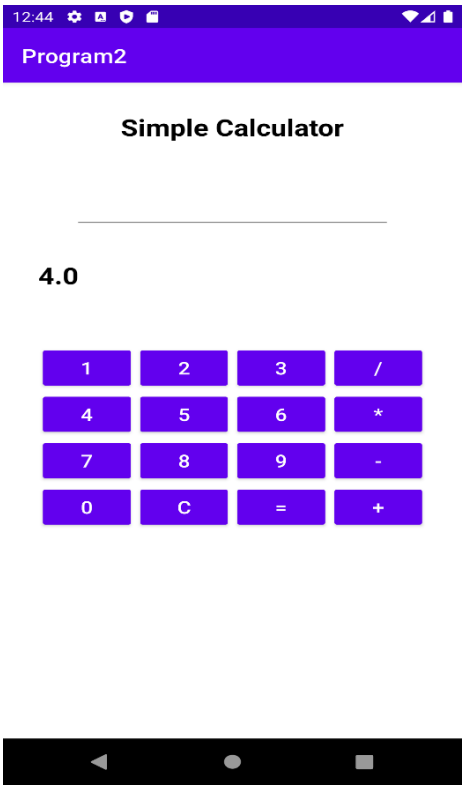
Main.activity.java

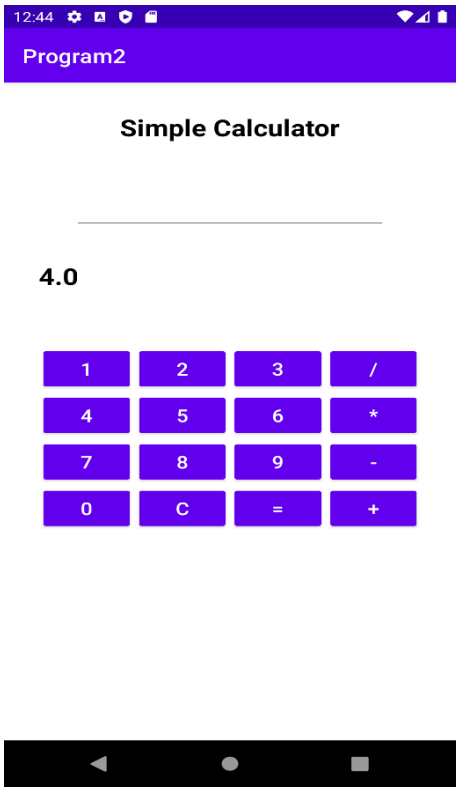
```
package com.example.calc;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    private TextView TextView1;
    private Button button1;
    private Button button2;
    private Button button3;
    private Button buttonDiv;
    private Button button4;
    private Button button5;
    private Button button6;
    private Button buttonMul;
    private Button button7;
    private Button button8;
    private Button button9;
    private Button buttonSub;
    private Button button0;
    private Button buttonDot;
    private Button buttonEqual;
    private Button buttonAdd;
    private String currentInput = "";
    private double operand1 = 0;
    private String operator = "";
```

```
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        TextView1 =  findViewById(R.id.TextView1);
    }
    public void onDigitClick(View view) {
        Button button = (Button) view;
        currentInput += button.getText().toString();
        updateDisplay();
    }
    public void onOperatorClick(View view){
        if (!currentInput.isEmpty()){
            operand1 = Double.parseDouble(currentInput);
            operator = ((Button) view).getText().toString();
            currentInput = "";
        }
    }
    public void onEqualsClick(View view){
        if (!currentInput.isEmpty()){
            double operand2 = Double.parseDouble(currentInput);
            double result = performOperation(operand1,operand2,operator);
            currentInput = String.valueOf((result));
            updateDisplay();
        }
    }
    public void onClearClick(View view){
        currentInput = "";
        operand1 = 0;
        operator = "";
```

```
updateDisplay();
    }
    private double performOperation(double operand1, double operand2, String operator){
        switch (operator){
            case "+":
                return operand1 + operand2;
            case "-":
                return operand1 - operand2;
            case "*":
                return operand1 * operand2;
            case "/":
                if (operand2 !=0) {
                    return operand1 / operand2;
                } else {
                    return Double.NaN;
                }
            default:
                return 0;
        }
    }
    public void updateDisplay(){
        TextView1.setText(currentInput);
    }
```

Output





Result : The program was executed successfully and the output was obtained. Thus, CO1 & CO2 has been attained.

Experiment No. 3

Aim: Write a program that demonstrates Activity Lifecycle.

CO1: Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator.

Procedure:

Activity_main.xml

```
package com.example.cycle;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      showToast("Activity Created");
   }
   protected void onStart(){
      super.onStart();
      showToast("Activity Started");
   }
   protected void onResume(){
      super.onResume();
      showToast("Activity Resumed");
   }
   protected void onPause(){
      super.onPause();
      showToast("Activity Paused");
   }
```

```
protected void onStop(){
        super.onStop();
        showToast("Activity Stopped");
    }
    protected void onRestart(){
        super.onRestart();
        showToast("Activity Restarted");
    }
    @Override
    protected void onDestroy() {
        super.onDestroy();
        showToast("Activity Destroyed");
    }
    void showToast(String message){
        Toast.makeText(this,message,Toast.LENGTH_LONG).show();
    }
}
```

MainActivity.java

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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">
    <TextView
        android:layout_width="match_parent"
```

```
    android:layout_height="match_parent"
    android:text="Activity Life Cycle"
    android:textAlignment="center"
    android:layout_marginTop="50dp"
    android:textSize="30dp"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Output

Result : The program was executed successfully and the output was obtained. Thus, CO1 has been attained.

Experiment No. 4

Aim: Implement validations on various UI controls

CO1: Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator.

CO2: Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

Procedure:

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"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">
    <Button
        android:id="@+id/constraintButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="ConstraintLayout" />
    <Button
        android:id="@+id/linearButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="LinearLayout" />
    <Button
        android:id="@+id/gridButton"
```

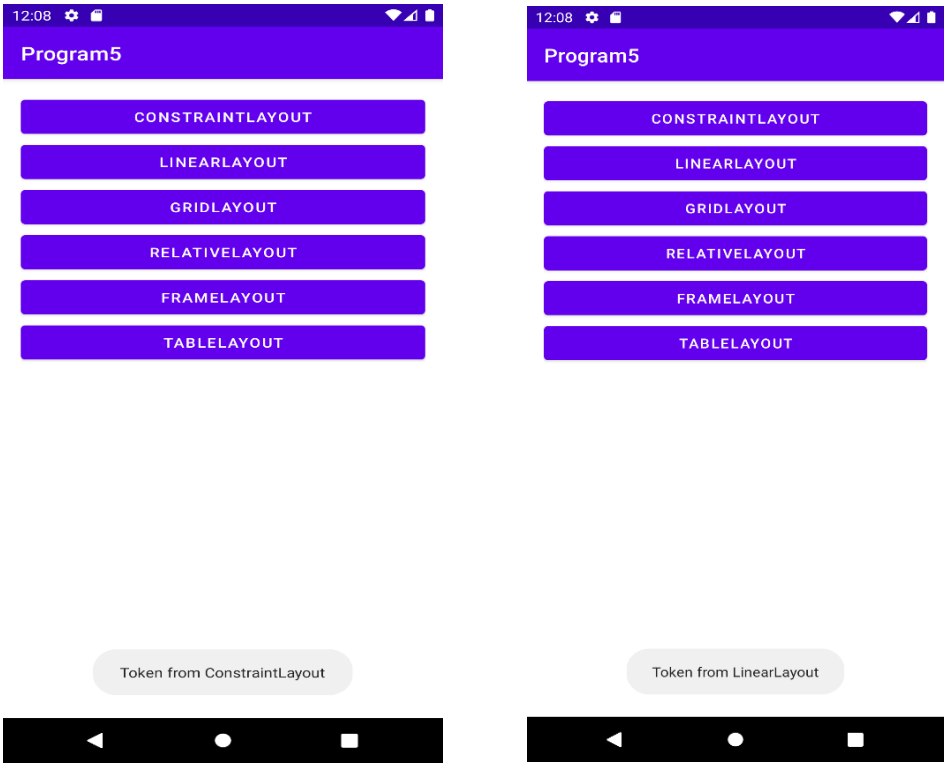
```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="GridLayout" />
    <Button
        android:id="@+id/relativeButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="RelativeLayout" />
    <Button
        android:id="@+id/frameButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="FrameLayout" />
    <Button
        android:id="@+id/tableButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="TableLayout" />
</LinearLayout>
```

MainActivity.java

```
package com.example.ui;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button constraintButton = findViewById(R.id.constraintButton);
        Button linearButton = findViewById(R.id.linearButton);
        Button gridButton = findViewById(R.id.gridButton);
        Button relativeButton = findViewById(R.id.relativeButton);
        Button frameButton = findViewById(R.id.frameButton);
        Button tableButton = findViewById(R.id.tableButton);

        View.OnClickListener buttonClickListener = new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String layoutName = ((Button) v).getText().toString();
                displayToken(layoutName);
            }
        };
        constraintButton.setOnClickListener(buttonClickListener);
        linearButton.setOnClickListener(buttonClickListener);
        gridButton.setOnClickListener(buttonClickListener);
        relativeButton.setOnClickListener(buttonClickListener);
        frameButton.setOnClickListener(buttonClickListener);
        tableButton.setOnClickListener(buttonClickListener);
    }
    private void displayToken(String layoutName) {
        Toast.makeText(this, "Token from " + layoutName, Toast.LENGTH_SHORT).show();
    }
}
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO1 & CO2 has been attained.

Experiment No. 5

Aim: Create a Facebook page using RelativeLayout; set properties using .xml file

CO2: Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

Procedure:

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="fill_parent"
   android:layout_height="fill_parent"
   android:paddingLeft="16dp"
   android:paddingRight="16dp" >
   <ScrollView
      android:layout_width="match_parent"
      android:layout_height="match_parent">
      <LinearLayout
         android:layout_width="fill_parent"
         android:layout_height="fill_parent"
         android:orientation="vertical">
         <ImageView
            android:id="@+id/facebookView"
            android:layout_width="200dp"
            android:layout_height="80dp"
            android:layout_gravity="center"
            android:src="@drawable/facebook" />
```

```
<ImageView
    android:id="@+id/imageView4"
    android:layout_width="match_parent"
    android:layout_height="281dp"
    android:src="@drawable/post" />
  <GridLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:layout_marginTop="40dp"
    android:columnCount="4"
    android:rowCount="4">
    <!-- Like ImageView -->
    <ImageView
      android:id="@+id/likeImageView"
      android:layout_width="110dp"
      android:layout_height="83dp"
      android:layout_gravity="center"
      android:clickable="true"
      android:onClick="onLikeClick"
      android:src="@drawable/like" />
    <!-- Comment ImageView -->
    <ImageView
      android:id="@+id/commentImageView"
      android:layout_width="111dp"
      android:layout_height="66dp"
      android:layout_row="0"
      android:layout_column="1"
```

```
        android:layout_gravity="center"
        android:clickable="true"
        android:onClick="onCommentClick"
        android:src="@drawable/comment" />
    <ImageView
        android:id="@+id/shareImageView"
        android:layout_width="93dp"
        android:layout_height="86dp"
        android:layout_row="0"
        android:layout_column="3"
        android:layout_gravity="center"
        android:clickable="true"
        android:onClick="onShareClick"
        android:src="@drawable/share" />
</GridLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical">
    <ImageView
        android:id="@+id/imageView7"
        android:layout_width="match_parent"
        android:layout_height="281dp"
        android:src="@drawable/dog" />
    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
```

```
android:layout_marginTop="40dp"
android:columnCount="4"
android:rowCount="4">
<!-- Like ImageView -->
<ImageView
   android:id="@+id/likeImageView2"
   android:layout_width="110dp"
   android:layout_height="83dp"
   android:layout_gravity="center"
   android:clickable="true"
   android:onClick="onLikeClick"
   android:src="@drawable/like" />
<!-- (Your existing ImageView code) -->
<!-- Comment ImageView -->
<ImageView
   android:id="@+id/commentImageView2"
   android:layout_width="111dp"
   android:layout_height="66dp"
   android:layout_row="0"
   android:layout_column="1"
   android:layout_gravity="center"
   android:clickable="true"
   android:onClick="onCommentClick"
   android:src="@drawable/comment" />
<ImageView
   android:id="@+id/shareImageView2"
   android:layout_width="93dp"
   android:layout_height="86dp"
```

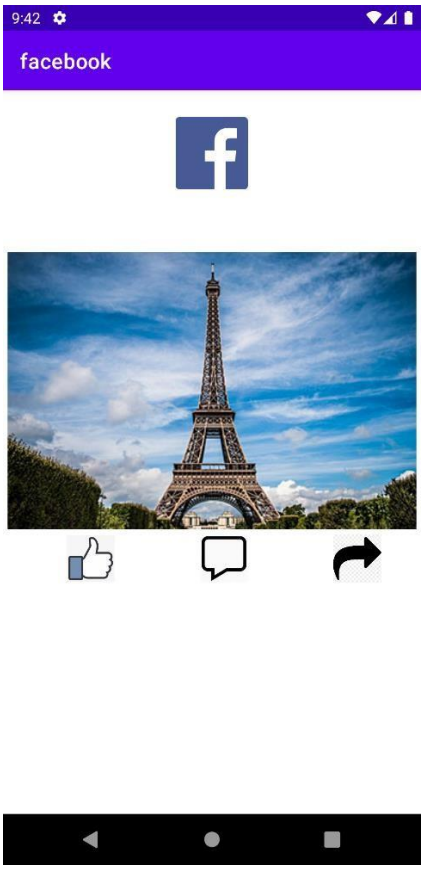
```
                android:layout_row="0"
                android:layout_column="3"
                android:layout_gravity="center"
                android:clickable="true"
                android:onClick="onShareClick"
                android:src="@drawable/share" />
            <!-- (Your existing ImageView code) -->
        </GridLayout>
    </LinearLayout>
  </LinearLayout>
</ScrollView>
</RelativeLayout>
```

MainActivity.java

```
package com.example.facebook;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.Toast;
public class MainActivity extends Activity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Find the ImageView elements by their IDs
    ImageView facebookView = findViewById(R.id.facebookView );
```

```
    ImageView likeImageView = findViewById(R.id.likeImageView);
    ImageView commentImageView = findViewById(R.id.commentImageView);
    ImageView shareImageView = findViewById(R.id.shareImageView);

    // Set click listeners for the ImageViews
    likeImageView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            showToast("You clicked the Like button");
        }
    });
    commentImageView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            showToast("You clicked the Comment button");
        }
    });
    shareImageView.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            showToast("You clicked the Share button");
        }
    });
}
// Helper method to display a toast message
private void showToast(String message) {
    Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
}
```

Output



Result: The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

Experiment No. 6

Aim: Develop an application that toggles image using FrameLayout

CO2: Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout 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:background="#BDBABA"
    tools:context=".MainActivity">
    <ImageView
        android:id="@+id/imageView1"
        android:layout_width="427dp"
        android:layout_height="wrap_content"
        android:layout_gravity="left|top"
        android:background="#CACAC8"
        app:srcCompat="@drawable/s1" />
    <ImageView
        android:id="@+id/imageView2"
        android:layout_width="396dp"
        android:layout_height="wrap_content"
        android:layout_gravity="left|top"
        android:visibility="gone"
        app:srcCompat="@drawable/f1" />
</FrameLayout>
```

MainActivity.java

```
javapackage com.example.frame_layout;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
public class MainActivity extends AppCompatActivity implements View.OnClickListener {
   ImageView i1,i2;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      i1=(ImageView) findViewById(R.id.imageView1);
      i2=(ImageView) findViewById(R.id.imageView2);
      i1.setOnClickListener(this);
      i2.setOnClickListener(this);
   }
   @Override
   public void onClick(View v) {
      if(v.getId()==R.id.imageView1){
         i1.setVisibility(v.GONE);
         i2.setVisibility(v.VISIBLE);
      }
      else{
         i2.setVisibility(v.GONE);
         i1.setVisibility(v.VISIBLE);
      }
   }
}
```

Output

Result : The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

Experiment No. 7

Aim: Design a registration activity and store registration details in local memory of phone using Intents and SharedPreferences.

CO2: Write simple programs and develop small applications using the concepts of UI design, layouts and preferences

Procedure:

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"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">
    <EditText
        android:id="@+id/usernameEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Username"
        android:inputType="text" />
    <EditText
        android:id="@+id/emailEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Email"
        android:inputType="textEmailAddress" />
```

```
    <EditText
        android:id="@+id/passwordEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Password"
        android:inputType="textPassword" />
    <Button
        android:id="@+id/registerButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:text="Register" />
</LinearLayout>
```

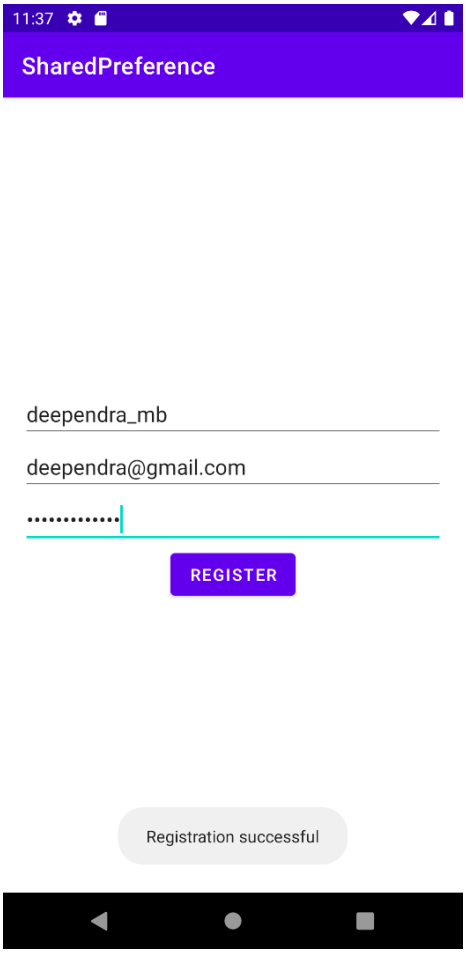
MainActivity.java

```
package com.example.registration;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    private EditText usernameEditText, emailEditText, passwordEditText;
    private Button registerButton;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        usernameEditText = findViewById(R.id.usernameEditText);
        emailEditText = findViewById(R.id.emailEditText);
        passwordEditText = findViewById(R.id.passwordEditText);
        registerButton = findViewById(R.id.registerButton);

        registerButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String username = usernameEditText.getText().toString();
                String email = emailEditText.getText().toString();
                String password = passwordEditText.getText().toString();
                // Store registration details in SharedPreferences
                SharedPreferences preferences = getSharedPreferences("MyPrefs",
MODE_PRIVATE);
                SharedPreferences.Editor editor = preferences.edit();
                editor.putString("username", username);
                editor.putString("email", email);
                editor.putString("password", password);
                editor.apply();

                Toast.makeText(MainActivity.this, "Registration successful",
Toast.LENGTH_SHORT).show();

                // Start another activity, e.g., MainActivity, using an Intent
```

```
            Intent intent = new Intent(MainActivity.this, MainActivity.class);
            startActivity(intent);
        }
    });
  }
}
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

Experiment No. 8

Aim: Develop an application that uses ArrayAdapter with ListView.

CO3 :Develop applications with multiple activities using intents, array adapter, exceptions and options menu

Procedure:

Activity_main.xml

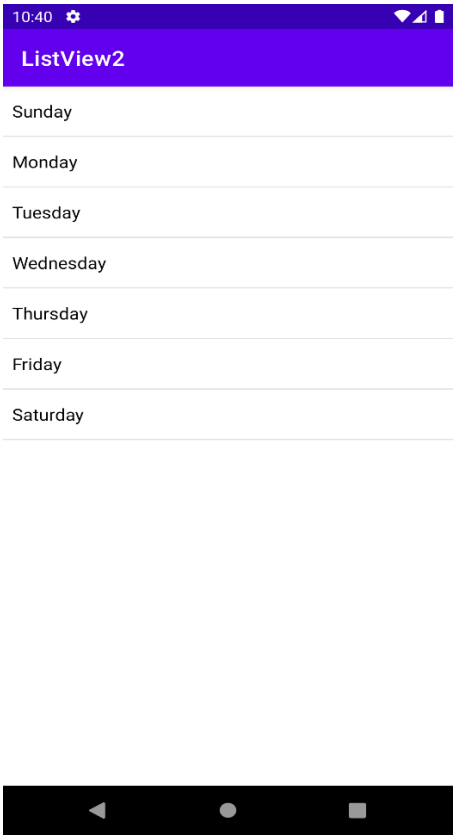
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">
   <ListView
      android:id="@+id/listview"
      android:layout_width="400dp"
      android:layout_height="400dp"
      tools:layout_editor_absoluteX="16dp"
      tools:layout_editor_absoluteY="-2dp"
      tools:ignore="MissingConstraints" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.ListView;
import android.view.View;
import android.widget.AdapterView;
import android.widget.Toast;
import android.widget.TextView;
```

```
import android.widget.ArrayAdapter;
public class MainActivity extends AppCompatActivity implements
AdapterView.OnItemClickListener {
   ListView l;
   String [] days =
{"Sunday","Monday","Tuesday","Wednesday","Thursday","Friday","Saturday"};
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      l = findViewById(R.id.listview);

      ArrayAdapter<String> adapter = new
            ArrayAdapter<String>(this,
androidx.appcompat.R.layout.support_simple_spinner_dropdown_item, days);
      l.setAdapter(adapter);
      l.setOnItemClickListener(this);
   }

   @Override
   public void onItemClick(AdapterView<?> adapterView, View view, int position, long id) {
      TextView temp = (TextView) view;
      Toast.makeText(this,"You Clicked "+temp.getText()+" at
"+position,Toast.LENGTH_LONG).show();
   }

}
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

Experiment No. 9

Aim: Implement Options Menu to navigate to activities

CO3 : Develop applications with multiple activities using intents, array adapter, exceptions and options menu

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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">
   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello World!"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity.java

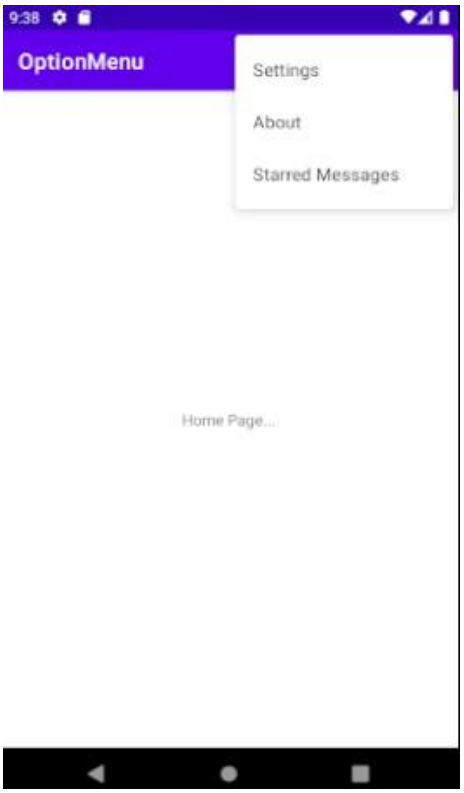
```
package com.example.optionmenu;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
```

```
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
   }
   @Override
   public boolean onCreateOptionsMenu(Menu menu) {
      MenuInflater inflater = getMenuInflater();
      inflater.inflate(R.menu.menu_main,menu);
      return super.onCreateOptionsMenu(menu);
   }
   @Override
   public boolean onOptionsItemSelected(@NonNull MenuItem item) {
      switch(item.getItemId()){
         case R.id.settings:
            Intent intent=new Intent(this,settingPage.class);
            startActivity(intent);
            break;
         case R.id.about:
            Toast.makeText(this, "You Clicked about option!!", Toast.LENGTH_SHORT).show();
            break;
         case R.id.logout:
            Toast.makeText(this, "You Clicked logout option!!",
Toast.LENGTH_SHORT).show();
            break;
      return super.onOptionsItemSelected(item);
}
```

Menu_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
<item
   android:id="@+id/settings"
   android:title="Setting" />
   <item
      android:id="@+id/about"
      android:title="About" />
   <item
      android:id="@+id/logout"
      android:title="Logout" />
</menu>
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

.

Experiment No. 10

Aim: Develop application that works with explicit intents

CO3 :Develop applications with multiple activities using intents, array adapter, exceptions and options menu

Procedure:

Activity_main1.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    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">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Activity 1"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.105" />
    <EditText
        android:id="@+id/EditText1"
        android:layout_width="379dp"
        android:layout_height="43dp"
        android:layout_marginBottom="460dp"
        android:hint="Please enter name"
        android:inputType="text"
```

```
    app:layout_constraintBottom_toBottomOf="parent"
    tools:layout_editor_absoluteX="16dp" />
  <EditText
    android:id="@+id/EditText2"
    android:layout_width="379dp"
    android:layout_height="43dp"
    android:layout_marginBottom="380dp"
    android:hint="Please enter age"
    android:inputType="text"
    app:layout_constraintBottom_toBottomOf="parent"
    tools:layout_editor_absoluteX="16dp" />
  <Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="268dp"
    android:onClick="switchActivity"
    android:text="Button"
    app:layout_constraintBottom_toBottomOf="parent"
    tools:layout_editor_absoluteX="158dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity1.xml

```
package com.example.myapplicationintent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
  EditText name,age;
```

```
 @Override

    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        name = findViewById(R.id.EditText1);
        age = findViewById(R.id.EditText2);
    }

    public void switchActivity(View view) {
        Intent intent=new Intent(this, MainActivity2.class);
        intent.putExtra("user",name.getText().toString());
        intent.putExtra("age",age.getText().toString());
        startActivity(intent);
    }
}
```

Activity_Main2.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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=".MainActivity2">

    <TextView
        android:id="@+id/activity2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Activity 2"
```

```
    tools:layout_editor_absoluteX="165dp"
    tools:layout_editor_absoluteY="372dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity2.xml

```
package com.example.myapplicationintent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;
public class MainActivity2 extends AppCompatActivity {
   TextView tv;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main2);
      Intent intent=getIntent();
      String user=intent.getStringExtra("user");
      String age=intent.getStringExtra("age");
      tv=findViewById(R.id.activity2);
      tv.setText(" Welcome "+user+" age "+age);
   }
}
```

Output

Result : The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

Experiment No. 11

Aim: Develop an application that implements Spinner component and perform event handling

CO4: Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    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">
    <TextView
        android:id="@+id/textview1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <Spinner
        android:id="@+id/spinner"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity.java

```
package com.example.spinner;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
    String [] names= {"Item1", "Item2", "Item3"};
    String [] des= {"Item1 Text", "item2 Text", "Item3 Text"};
    ArrayAdapter<String> adapter;
    Spinner spinner;
    TextView selected_item_textview;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        spinner = findViewById(R.id.spinner);
        selected_item_textview = findViewById(R.id.selected_item_textview);
        adapter=new ArrayAdapter<String>(getApplicationContext(),
android.R.layout.simple_list_item_1,names);
        spinner.setAdapter(adapter);
        spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
              switch (i){
                  case 0:
                      selected_item_textview.setText(""+des[i]);
                      break;
```

```
            case 1:
                selected_item_textview.setText(""+des[i]);
                break;
            case 2:
                selected_item_textview.setText(""+des[i]);
                break;
          }
        }
        @Override
        public void onNothingSelected(AdapterView<?> adapterView) {
        }
      });
   }
}
```

Output

Result : The program was executed successfully and the output was obtained. Thus, CO4 has been attained.

.

Experiment No. 12

Aim: Develop an application using fragments

CO4 : Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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">
    <Button
        android:id="@+id/fragment1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fragment1"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:layout_marginStart="16dp"
        android:layout_marginTop="16dp"
        android:layout_marginBottom="16dp"/>
    <Button
        android:id="@+id/fragment2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fragment2"
        app:layout_constraintStart_toEndOf="@id/fragment1"
```

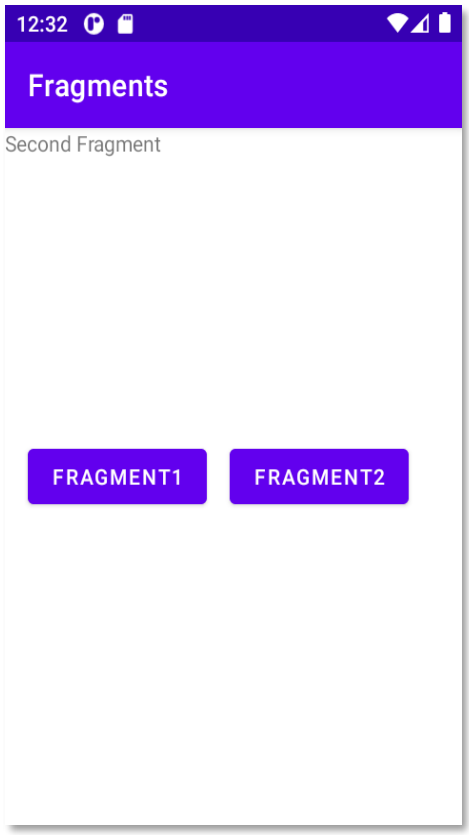
```
      app:layout_constraintTop_toTopOf="@id/fragment1"
      app:layout_constraintBottom_toBottomOf="@id/fragment1"
      android:layout_marginStart="16dp"/>
   <FrameLayout
      android:id="@+id/fragment_container"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
     />
</androidx.constraintlayout.widget.ConstraintLayout>
```

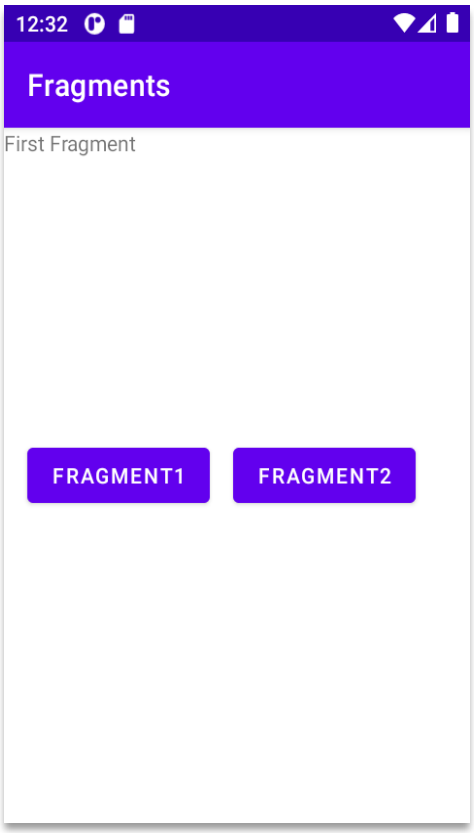
Main_Activity.java

```
package com.example.fragments;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);

      Button buttonFragment1 = findViewById(R.id.fragment1);
      Button buttonFragment2 = findViewById(R.id.fragment2);

      buttonFragment1.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            getSupportFragmentManager().beginTransaction()
                  .replace(R.id.fragment_container, new FirstFragment())
                  .commit();
         }
```

```
        });
        buttonFragment2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                getSupportFragmentManager().beginTransaction()
                        .replace(R.id.fragment_container, new SecondFragment())
                        .commit();
            }
        });
    }
}
```

Output





Result : The program was executed successfully and the output was obtained. Thus, CO4 has been attained.

Experiment No. 13

Aim: Implement Adapters and perform exception handling

CO4 : Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes

Procedure:

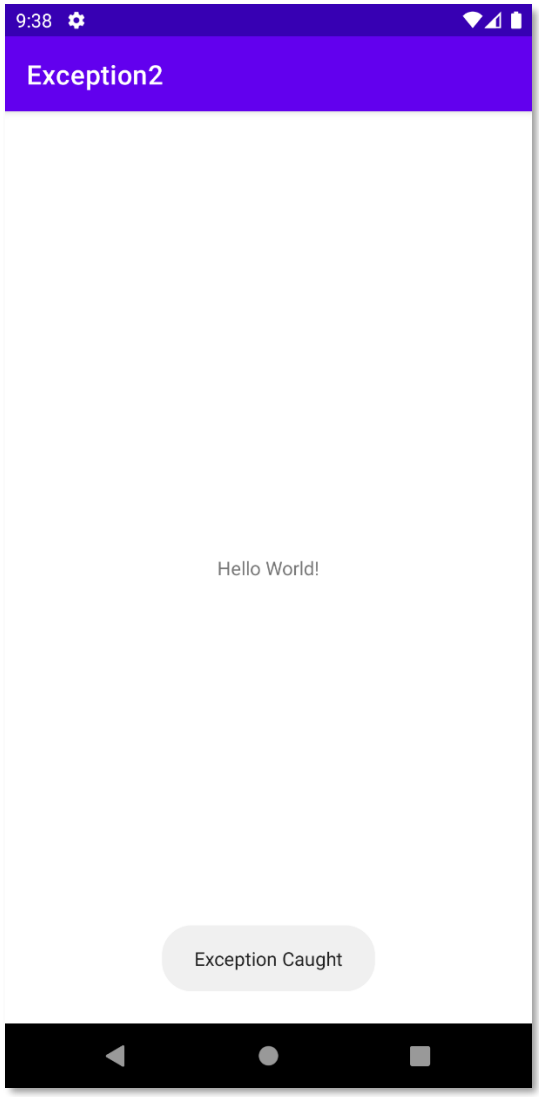
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
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">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <ListView
        android:id="@+id/listview"
        android:layout_width="match_parent"
        android:layout_height="match_parent">
    </ListView>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_Activity.java

```
package com.example.exception2;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;
import java.util.ArrayList;
import java.util.List;
public class MainActivity extends AppCompatActivity {
   List<String> list=new ArrayList();
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);

      list.add("ITEM1");
      list.add("ITEM2");
      list.add("ITEM3");
      list.add("ITEM4");

      for(int i=0;i<5;i++) {
         try {
            list.get(i);
         } catch(Exception e){
            Toast.makeText(this, "Exception Caught", Toast.LENGTH_SHORT).show();
         }
      }
   }
}
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO4 has been attained.

.

Experiment No. 14

Aim: Create database using SQLite and perform INSERT and SELECT

CO5 : Develop mobile applications using SQLite.

Procedure:

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=".MainActivity">
   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="STUDENT DETAILS"
      android:layout_centerHorizontal="true"
      />
   <EditText
      android:id="@+id/edit1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Rollno"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/textView"
```

```
/>
   <EditText
      android:id="@+id/edit2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Name"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/edit1"
      />
   <EditText
      android:id="@+id/edit3"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Department"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/edit2"
      />
   <Button
      android:id="@+id/button1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="INSERT"
      android:onClick="onInsert"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/edit3" />
```

```
    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="READ"
        android:onClick="onRead"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/button2" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.sql;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
    TextView textView;
    EditText edit1, edit2, edit3;
    Button button1, button2, button3, button4;
    String rno;
    String name;
    String dept;
```

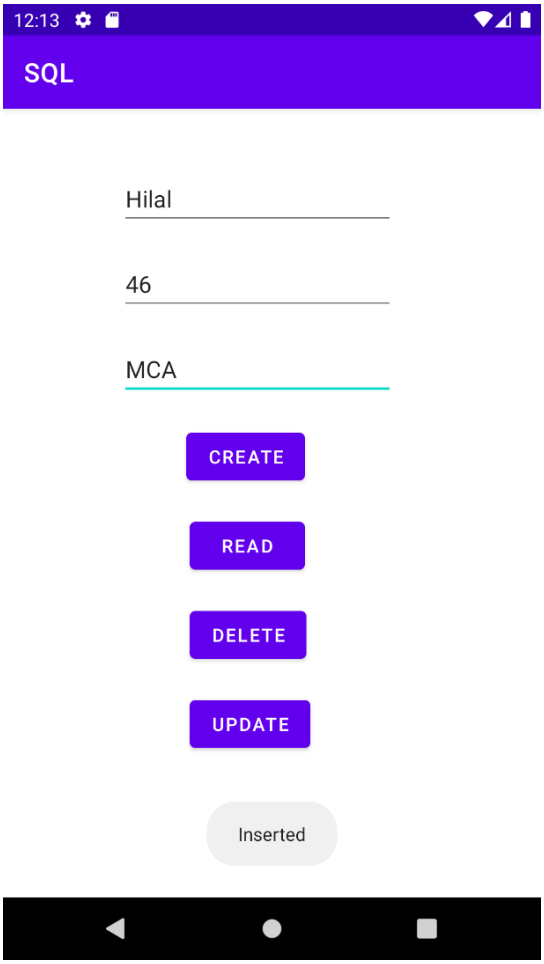
```
 SQLiteDatabase db;
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    textView = findViewById(R.id.textView);
    edit1 = findViewById(R.id.edit1);
    edit2 = findViewById(R.id.edit2);
    edit3 = findViewById(R.id.edit3);
    button1 = findViewById(R.id.button1);
    button2 = findViewById(R.id.button2);
    button3 = findViewById(R.id.button3);
    button4 = findViewById(R.id.button4);
    DBHelper dbHelper = new DBHelper(this);
    db = dbHelper.getWritableDatabase();
    db = dbHelper.getReadableDatabase(); }
public void onInsert(View view) {
    rno = edit1.getText().toString();
    name = edit2.getText().toString();
    dept = edit3.getText().toString();
    if(rno.equals("")  || name.equals("") || dept.equals("")){
       Toast.makeText(this, "Please Enter Values", Toast.LENGTH_SHORT).show();}
    Else{
       ContentValues values = new ContentValues();
       values.put("rollno", rno);
       values.put("name", name);
       values.put("dept", dept);
       db.insert("student", null, values);
       Toast.makeText(this, "Inserted", Toast.LENGTH_SHORT).show();
```

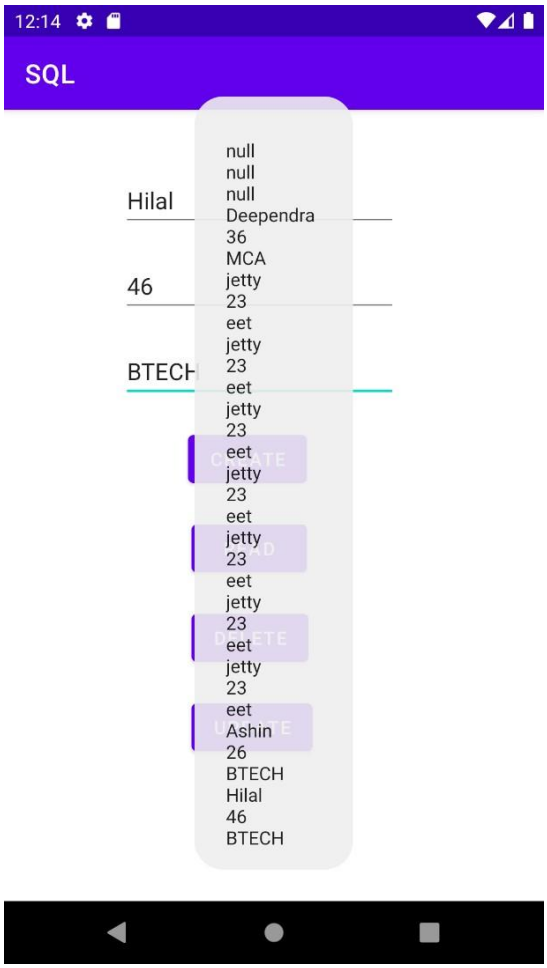
```
 } }
   public void onRead(View view) {
  }}
```

DBHelper.java

```
package com.example.sql;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;
public class DBHelper extends SQLiteOpenHelper {
   public DBHelper(@Nullable Context context) {
      super(context, "student.db", null , 1 );
   }
   @Override
   public void onCreate(SQLiteDatabase sqLiteDatabase) {
      sqLiteDatabase.execSQL("create table student(rollno int, name varchar(20), dept varchar(10))");
   }
   @Override
   public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {
      sqLiteDatabase.execSQL("drop table if exists student");
      onCreate(sqLiteDatabase);
   }
}
```

Output





Result : The program was executed successfully and the output was obtained. Thus, CO5 has been attained.

Experiment No. 15

Aim: Perform UPDATE and DELETE on SQLite database

CO5 : Develop mobile applications using SQLite.

Procedure:

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=".MainActivity">
   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="STUDENT DETAILS"
      android:layout_centerHorizontal="true" />
   <EditText
      android:id="@+id/edit1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Rollno"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/textView”/>
```

```
<EditText
    android:id="@+id/edit2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Enter Name"
    android:layout_margin="10dp"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/edit1"/>
  <EditText
    android:id="@+id/edit3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Enter Department"
    android:layout_margin="10dp"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/edit2"/>
  <Button
    android:id="@+id/button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="INSERT"
    android:onClick="onInsert"
    android:layout_margin="10dp"
    android:layout_centerHorizontal="true"
    android:layout_below="@id/edit3" />
  <Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:text="UPDATE"
        android:onClick="onUpdate"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/button1" />
    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="READ"
        android:onClick="onRead"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/button2" />
    <Button
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="DELETE"
        android:onClick="onDelete"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/button3" />
</RelativeLayout>
```

MainActivity.java

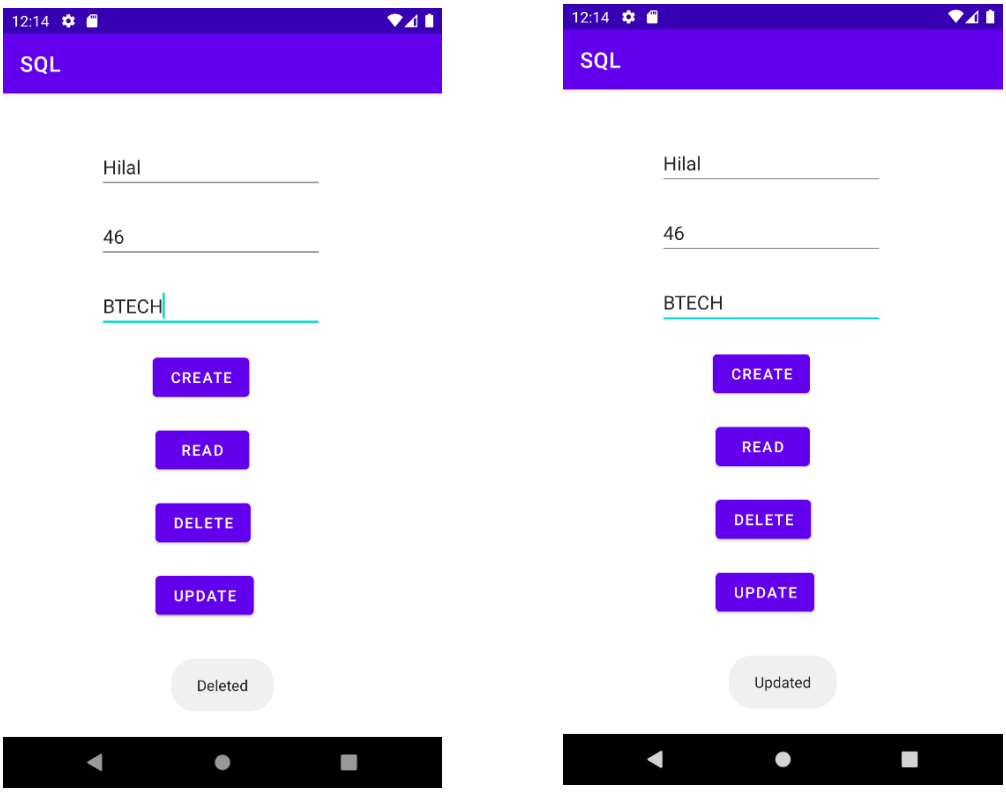
```
package com.example.sql;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
    TextView textView;
    EditText edit1, edit2, edit3;
    Button button1, button2, button3, button4;
    String rno;
    String name;
    String dept;
    SQLiteDatabase db;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        textView = findViewById(R.id.textView);
        edit1 = findViewById(R.id.edit1);
        edit2 = findViewById(R.id.edit2);
        edit3 = findViewById(R.id.edit3);
        button1 = findViewById(R.id.button1);
        button2 = findViewById(R.id.button2);
```

```
        button3 = findViewById(R.id.button3);
        button4 = findViewById(R.id.button4);
        DBHelper dbHelper = new DBHelper(this);
        db = dbHelper.getWritableDatabase();
        db = dbHelper.getReadableDatabase();
    }
    public void onInsert(View view) {
        rno = edit1.getText().toString();
        name = edit2.getText().toString();
        dept = edit3.getText().toString();
        if(rno.equals("")  || name.equals("") || dept.equals("")){
            Toast.makeText(this, "Please Enter Values", Toast.LENGTH_SHORT).show();
        }
    else{
            ContentValues values = new ContentValues();
            values.put("rollno", rno);
            values.put("name", name);
            values.put("dept", dept);
            db.insert("student", null, values);
            Toast.makeText(this, "Inserted", Toast.LENGTH_SHORT).show();
        }}
    public void onUpdate(View view) {
    }
    public void onRead(View view) {
    }
    public void onDelete(View view) {
    }
}
```

DBHelper.java

```
package com.example.sql;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;
public class DBHelper extends SQLiteOpenHelper
 {
   public DBHelper(@Nullable Context context)
 {
      super(context, "student.db", null , 1 );
   }
   @Override
   public void onCreate(SQLiteDatabase sqLiteDatabase)
{
      sqLiteDatabase.execSQL("create table student(rollno int, name varchar(20), dept varchar(10))");
   }
   @Override
   public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1)
{
      sqLiteDatabase.execSQL("drop table if exists student");
      onCreate(sqLiteDatabase);
   }
}
```

Output



Result : The program was executed successfully and the output was obtained. Thus, CO5 has been attained.