20MCA243 – Mobile Application Development Lab

Lab Report Submitted By

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In Partial Fulfillment 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 **ANINA ELIZEBETH (AJC22MCA-2017)** in partial fulfillment 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 linear layout 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

MainActivity.java

```java
package com.example.exp1;

import android.util.Log;

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 validUser = "user";

  private static final String validPass = "password";

  private EditText usernameEditText;

  private EditText passwordEditText;

  private Button LoginButton;

  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 enetredPassword = passwordEditText.getText().toString();

        if (isValidCredentials(enteredUsername, enetredPassword)) {

            showToast("Login Successfully");

        } else {

            showToast("Invalid Credentials");

        }

    });

  }

  private boolean isValidCredentials(String enteredUsername, String enetredPassword) {

      return validUser.equals(enteredUsername) && validPass.equals(enetredPassword);
```

Activity_main.xml

```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">

  <TextView

    android:layout_width="match_parent"

    android:layout_height="wrap_content"

    android:text="LogIn Form"

    android:textColor="@color/black"

    android:textAlignment="center" />

  <TextView

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:text="Username"
```

```
    android:textColor="@color/black"

    android:textAlignment="left"  />

  <EditText

    android:id="@+id/usernameEditText"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:hint="Login"

    android:inputType="text" />

  <TextView

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:text="Password"

    android:textColor="@color/black"

    android:textAlignment="left"  />

  <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/LoginButton"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:textAlignment="center"

    android:layout_gravity="center"

    android:text="Submit" />

</LinearLayout>
```

Output
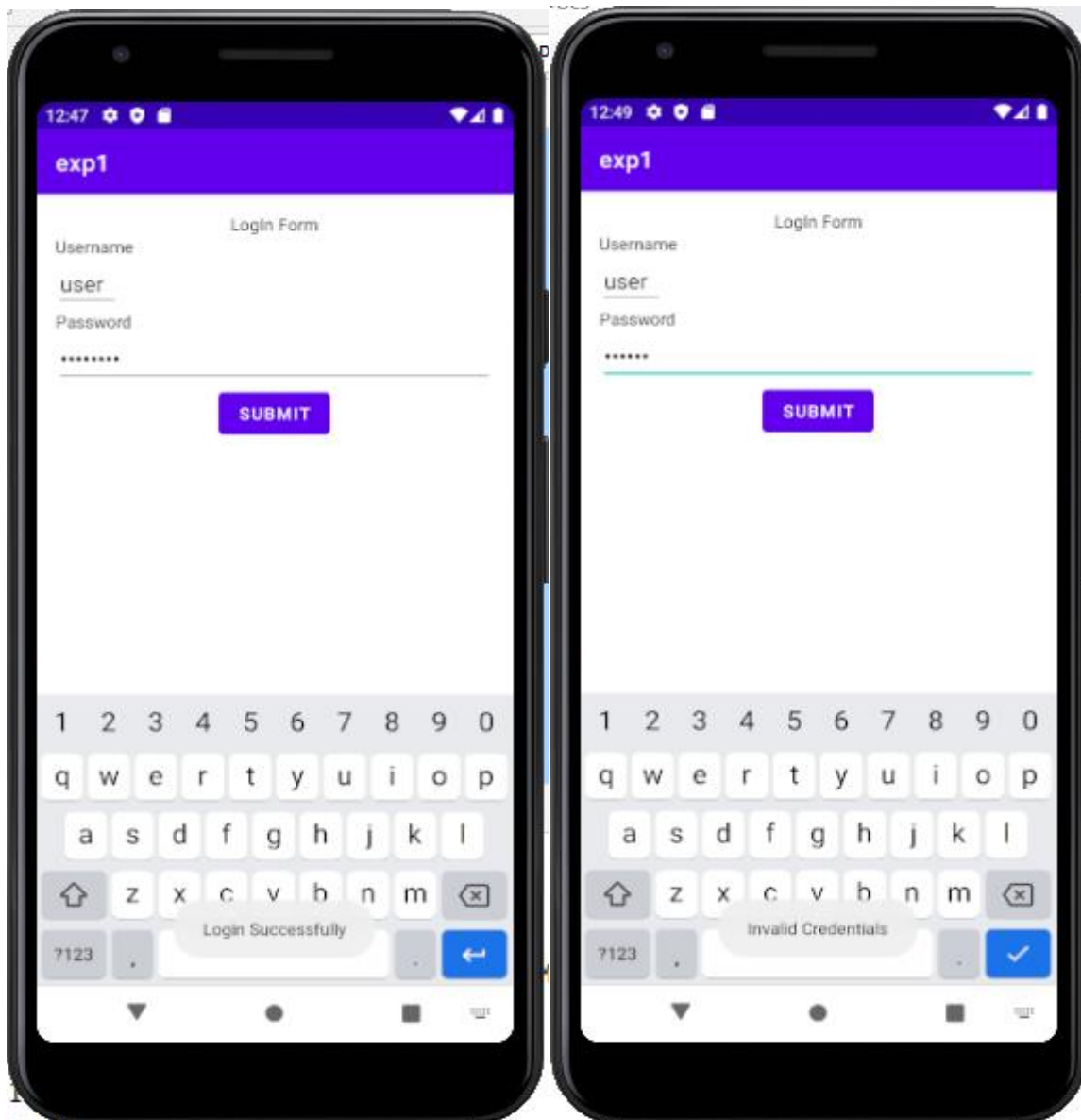
Result

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

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

MainActivity.java

```java
package com.example.cal;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Button;

public class MainActivity extends AppCompatActivity {

    private TextView TextView1;

    private String currentInput="";

    private double operand1=0;

    private String operator="";

    private double operand2=0;

    private String result="";

    private Button button1;

    private Button button2;

    private Button button3;

    private Button button4;

    private Button button5;
```

```java
private Button button6;

private Button button7;

private Button button8;

private Button button9;

private Button button0;

private Button buttonSub;

private Button buttonMul;

private Button buttonDiv;

private Button buttonDot;

private Button buttonEqual;

private Button buttonAdd;

@Override
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();

}
private void updateDisplay() {

    TextView1.setText(currentInput);

}
public void onOperatorClick(View view){

    if(!currentInput.isEmpty()){

        operand1=Double.parseDouble(currentInput);

        operator =((Button) view).getText().toString();

        currentInput="";

    }
```

```java
  }
  public void onEqualsClick(View view)
  {
     if(!currentInput.isEmpty()){
        double operand2=Double.parseDouble(currentInput);
        double result=performOperation(operand1,operand2,operator);
        currentInput=String.valueOf(result);
        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;
           }
        case"%":
           if(operand2 != 0)
           {
              return operand1%operand2;
```

```
            }
            else
            {
                return Double.NaN;
            }
        default:
            return 0;
        }
    }
    public void onClearClick(View view){
        currentInput="";
        operand1=0;
        operator="";
        updateDisplay();
    }
}
```

Activity_main.xml

```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">
    <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"/>

<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>
```

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

MainActivity.java

```java
package com.example.exp3;

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);

    Toast.makeText(MainActivity.this,"Created",Toast.LENGTH_LONG).show();

  }

  @Override
  protected void onStart() {

    super.onStart();

    Toast.makeText(MainActivity.this,"Start",Toast.LENGTH_LONG).show();

  }

  @Override
  protected void onResume() {

    super.onResume();

    Toast.makeText(MainActivity.this,"Resume",Toast.LENGTH_LONG).show();

  }

  @Override
```

```java
protected void onPause() {

    super.onPause();

    Toast.makeText(MainActivity.this,"Pause",Toast.LENGTH_LONG).show();

}

@Override

protected void onStop() {

    super.onStop();

    Toast.makeText(MainActivity.this,"Stop",Toast.LENGTH_LONG).show();

}

@Override

protected void onRestart() {

    super.onRestart();

    Toast.makeText(MainActivity.this,"Restart",Toast.LENGTH_LONG).show();

}

@Override

protected void onDestroy() {

    super.onDestroy();

    Toast.makeText(MainActivity.this,"Destroy",Toast.LENGTH_LONG).show();

}

}
```

Activity_main.xml

```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">
```

```xml
<TextView
    android:id="@+id/TextView1"
    android:layout_width="223dp"
    android:layout_height="46dp"
    android:layout_gravity="center"
    android:layout_marginBottom="16dp"
    android:text="Activity LifeCycle"
    android:textColor="@color/black"
    android:textSize="24sp"
    android:textStyle="bold" />
</LinearLayout>
```

Output
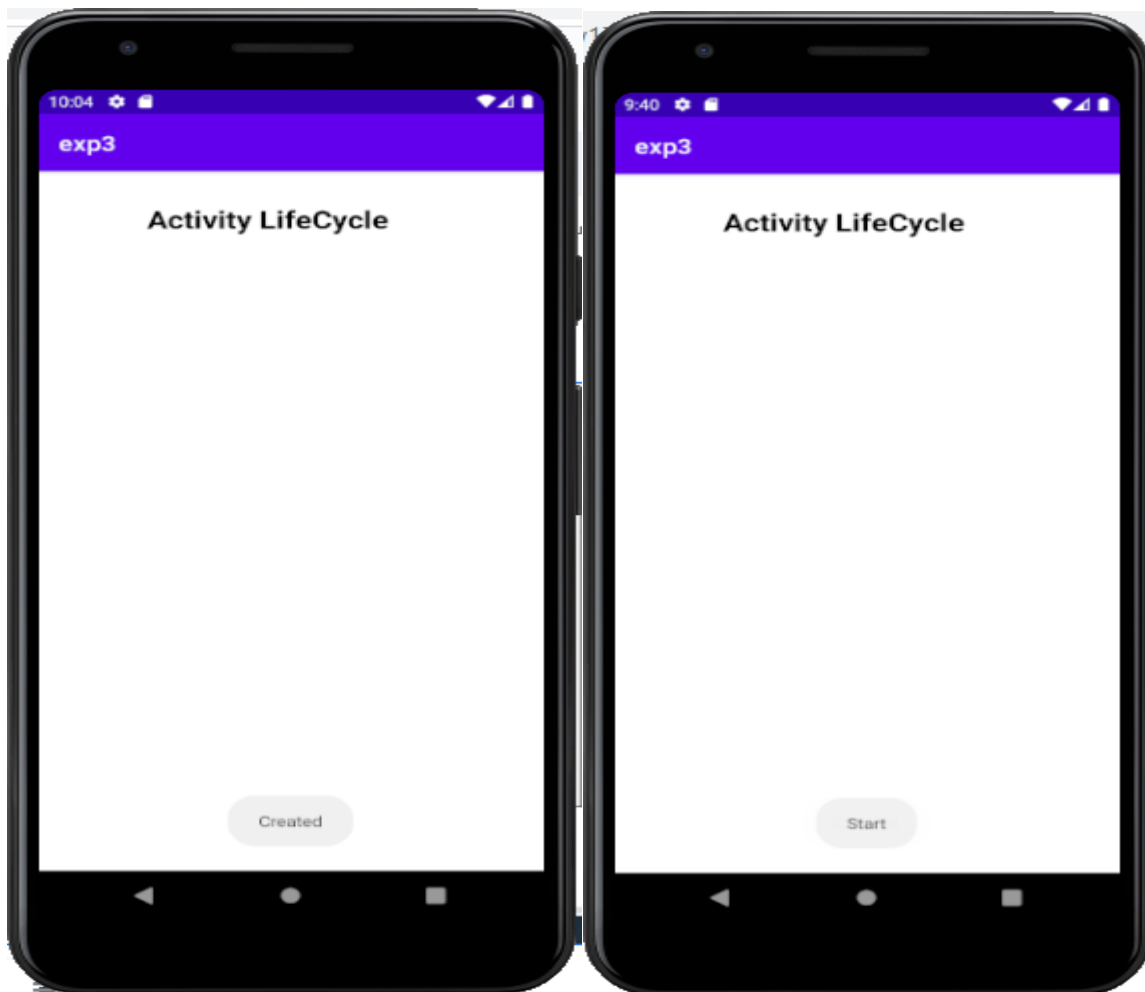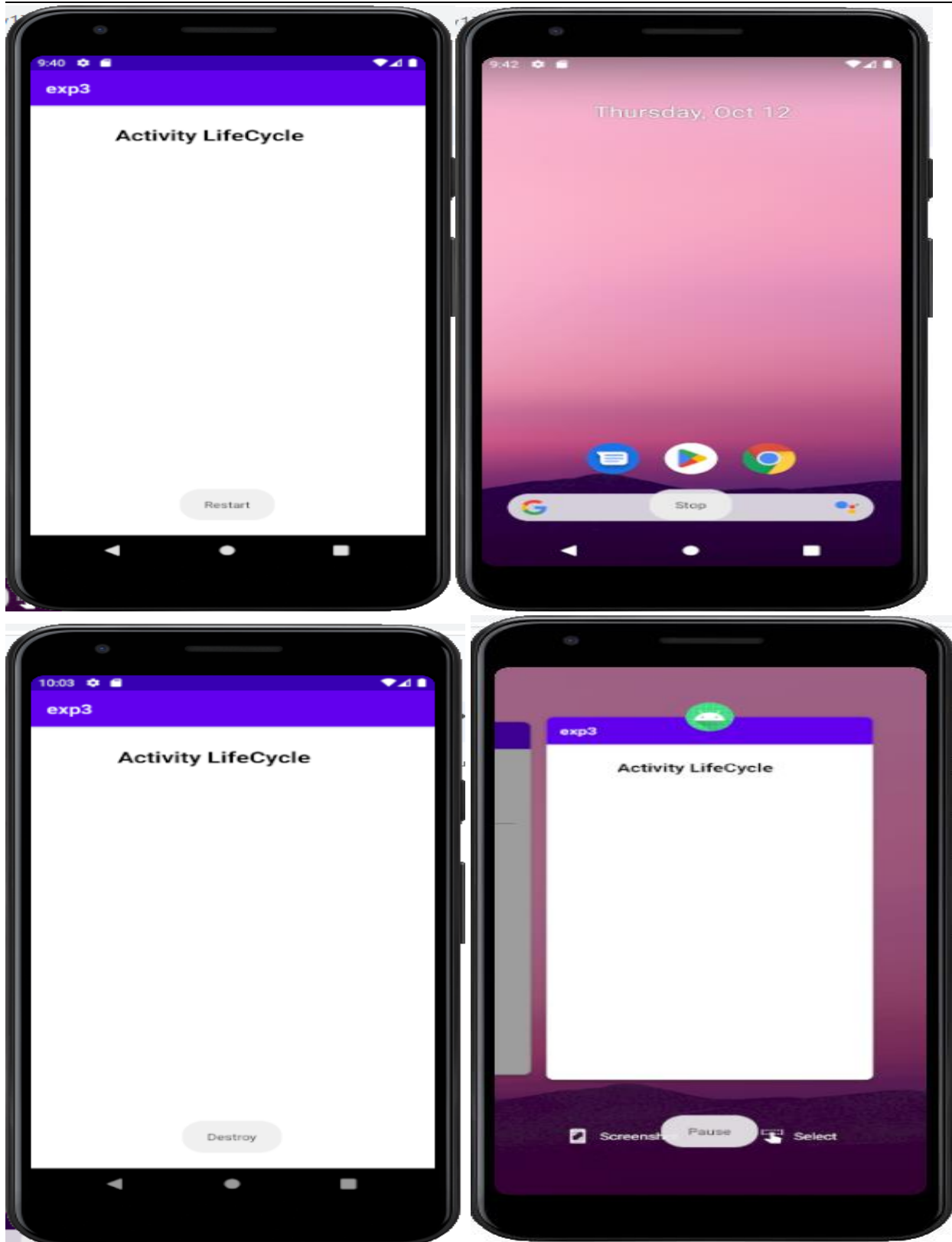
Result

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

MainActivity.java

```java
package com.example.toast;

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() {
```

```java
    @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();
  }
}
```

Activity_main.xml

```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"
```

```xml
        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>
```
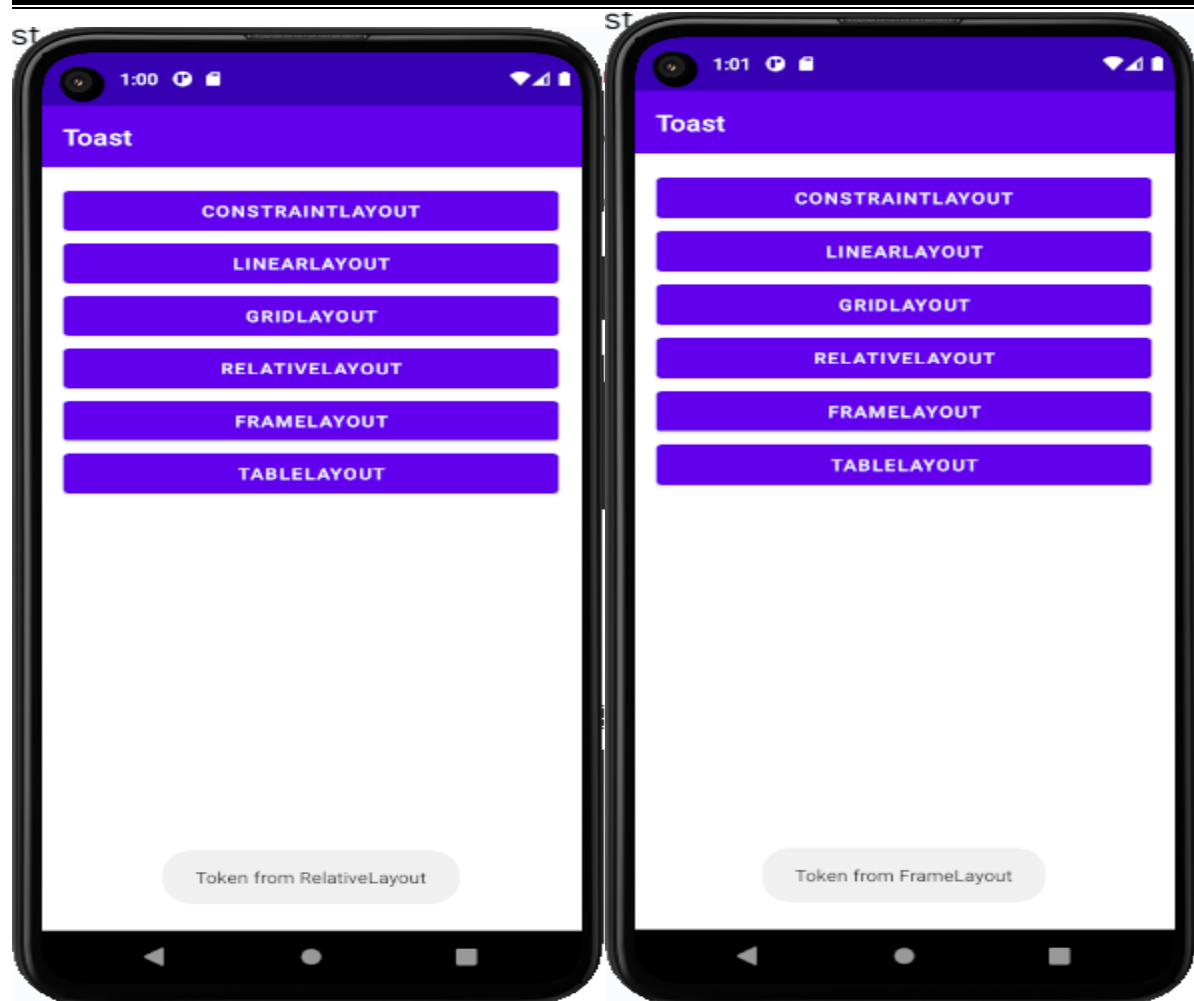
Result

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

MainActivity.java

```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);
    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");
        }
    });
  }
  private void showToast(String message) {
    Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
  }
}
```

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"
```

```xml
    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/img_3" />
    <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">
        <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/img" />
```

```xml
    <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/img_1" />
    <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/img_4" />
</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/img_5" />
    <GridLayout
```

```xml
    android:layout_width="match_parent"

    android:layout_height="wrap_content"

    android:layout_gravity="center"

    android:layout_marginTop="40dp"

    android:columnCount="4"

    android:rowCount="4">

    <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/img" />

    <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/img_1" />

    <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/img_4" />

        </GridLayout>

    </LinearLayout>

  </LinearLayout>

 </ScrollView>

</RelativeLayout>
```

Output
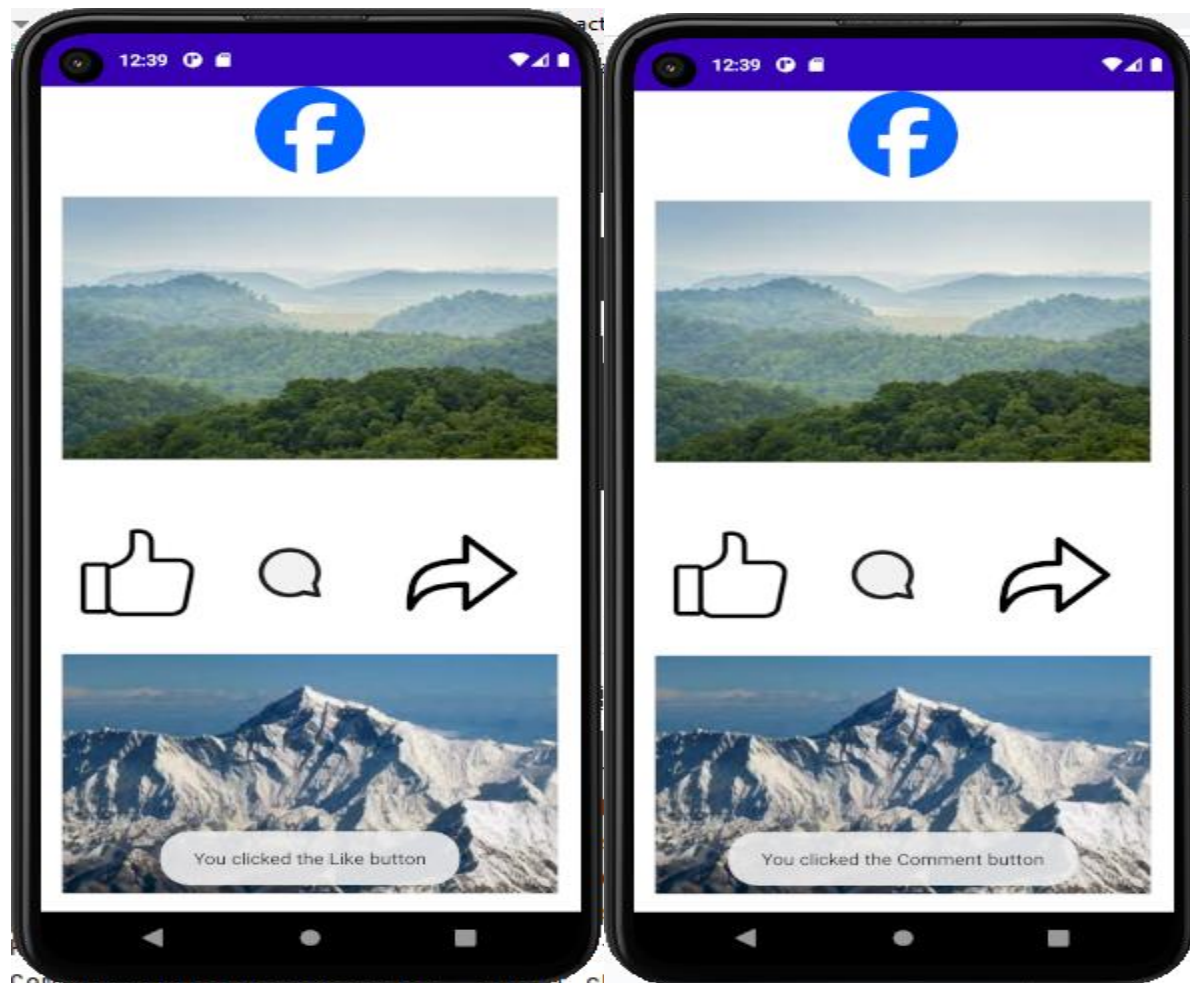
Result

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

MainActivity.java

```java
package com.example.toggle;

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);

   }

  }

}
```

Activity_main.xml

```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/img" />


  <ImageView

    android:id="@+id/imageView2"
```
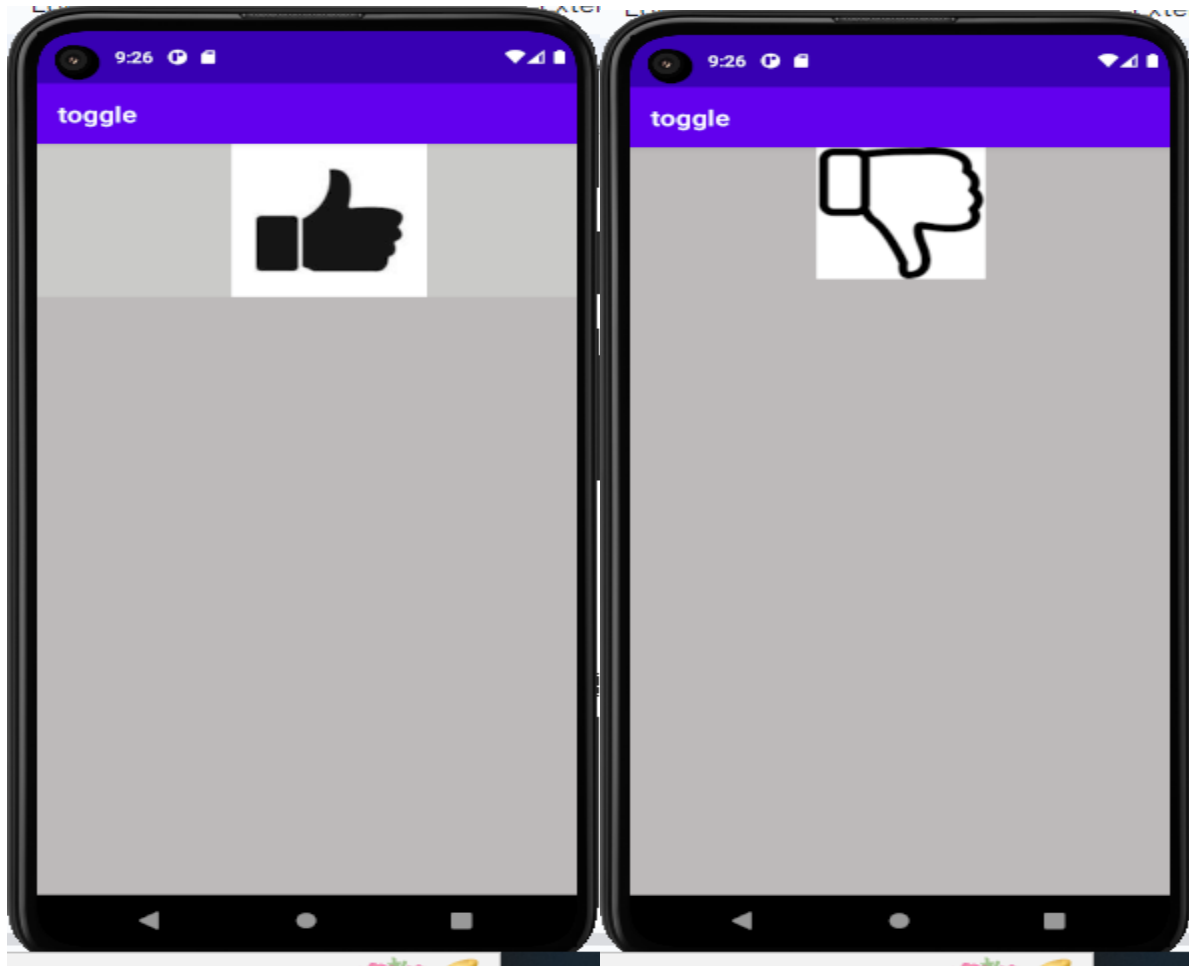
android:layout_width="396dp"

android:layout_height="wrap_content"

android:layout_gravity="left|top"

android:visibility="gone"

app:srcCompat="@drawable/img_1" />

</FrameLayout>

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

MainActivity.java

```java
package com.example.intent;

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);
```

```java
        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();

                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();

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

                startActivity(intent);

            }

        });

    }

}
```

Activity_main.xml

```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"
```

```xml
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>
```

Output
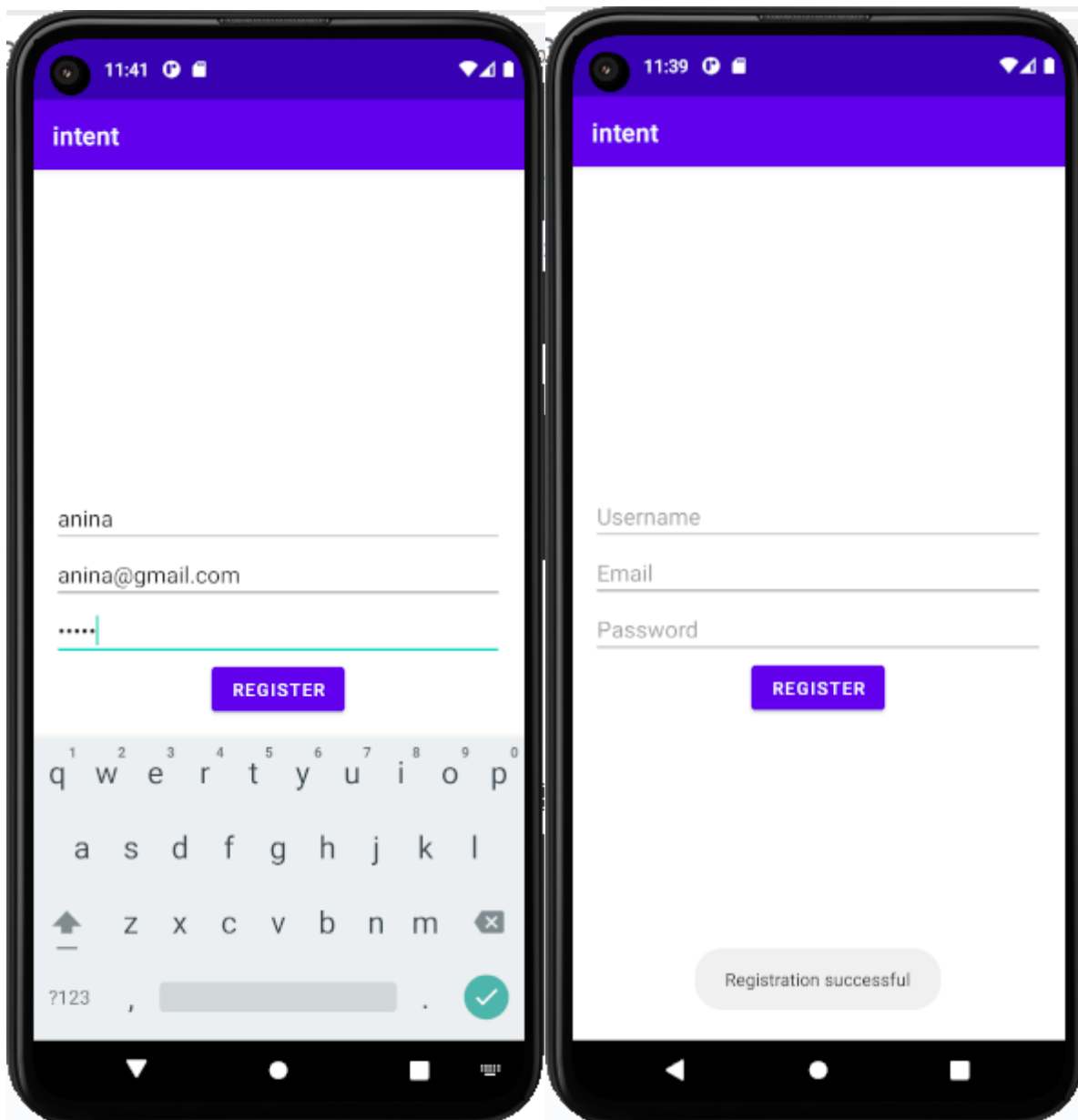
Result

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

MainActivity.java

package com.example.expr;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.AdapterView;

import android.widget.Toast;

import android.widget.TextView;

import android.widget.ListView;

import android.widget.ArrayAdapter;

import org.w3c.dom.Text;

public class MainActivity extends AppCompatActivity implements AdapterView.OnItemClickListener {

  ListView listView;

  String[] data = {"Sunday", "Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday"};

  @Override

  protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_main);

    listView = findViewById(R.id.listView);

    ArrayAdapter<String> adapter = new ArrayAdapter<>(this,android.R.layout.simple_list_item_1, data);

```
    listView.setAdapter(adapter);

    listView.setOnItemClickListener(this);

  }

  @Override

  public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {

    TextView selectedItem = (TextView) view; // Retrieve the selected item from the data array

    Toast.makeText(this, selectedItem.getText()+" at "+i, Toast.LENGTH_LONG).show();

  }

}
```

Activity_main.xml

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

<RelativeLayout

  xmlns:android="http://schemas.android.com/apk/res/android"

  xmlns:tools="http://schemas.android.com/tools"

  xmlns:app="http://schemas.android.com/apk/res-auto"

  android:layout_width="409dp"

  android:layout_height="354dp"

  tools:layout_editor_absoluteX="1dp"

  tools:layout_editor_absoluteY="1dp">

  <ListView

    android:id="@+id/listView"

    android:layout_width="match_parent"

    android:layout_height="match_parent" />

</RelativeLayout>
```

Output
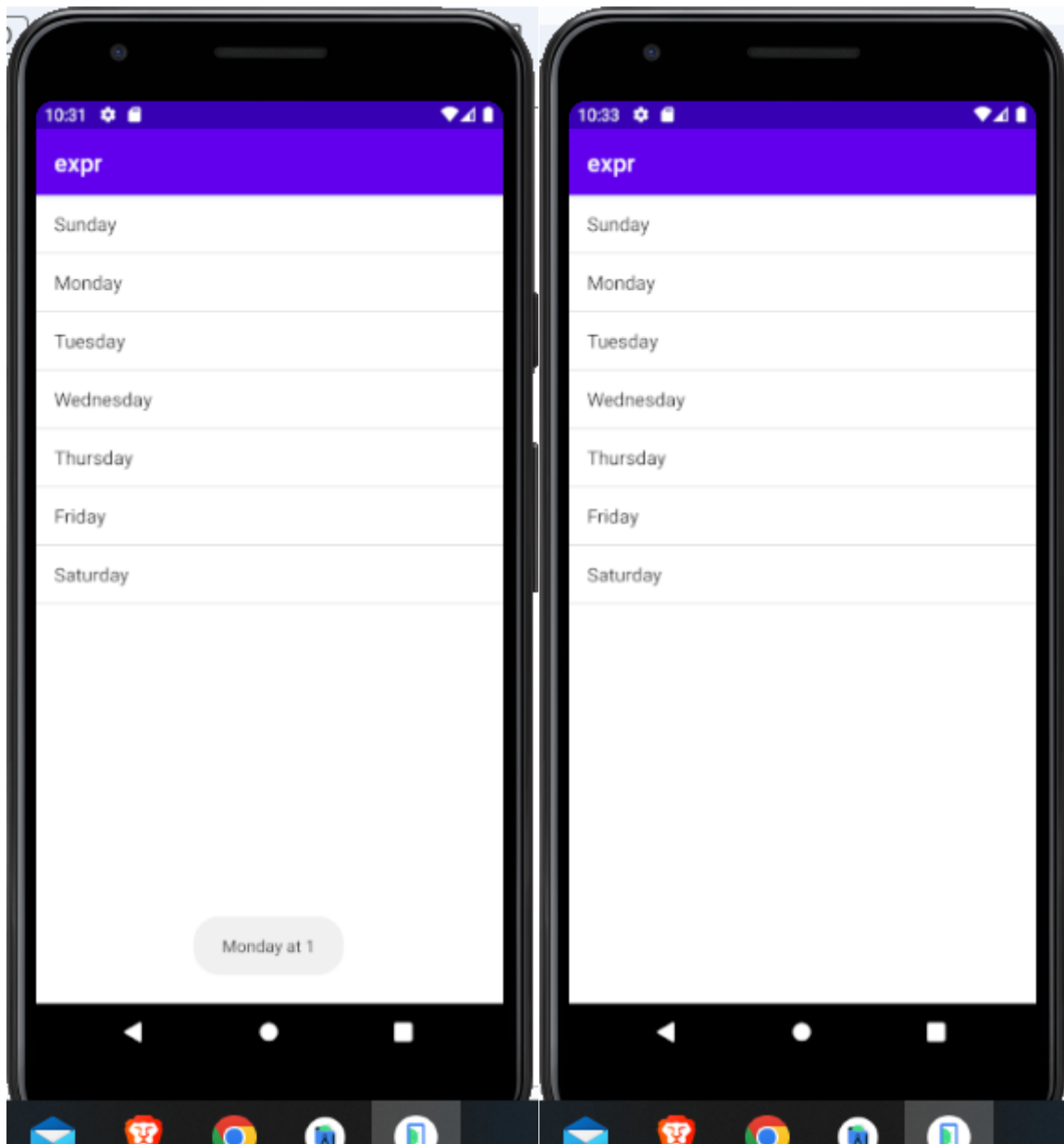
Result

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

MainActivity.java

```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 in=getMenuInflater();

    in.inflate(R.menu.menu_resource,menu);

    return super.onCreateOptionsMenu(menu);

  }
```

```java
    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        switch (item.getItemId()){
            case R.id.i:
                Intent intent= new Intent(this,settings.class);
                startActivity(intent);
                break;
            case R.id.i1:
                Toast.makeText(this,"YOU CLICKED ABOUT",Toast.LENGTH_LONG).show();
                break;
            case R.id.i2:
                Toast.makeText(this,"YOU CLICKED Logout",Toast.LENGTH_LONG).show();
                break;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

Menu_resource.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/i"
        android:title="Setting" />
    <item
        android:id="@+id/i1"
        android:title="About" />
    <item
        android:id="@+id/i2"
        android:title="Logout" />
</menu>
```

Output
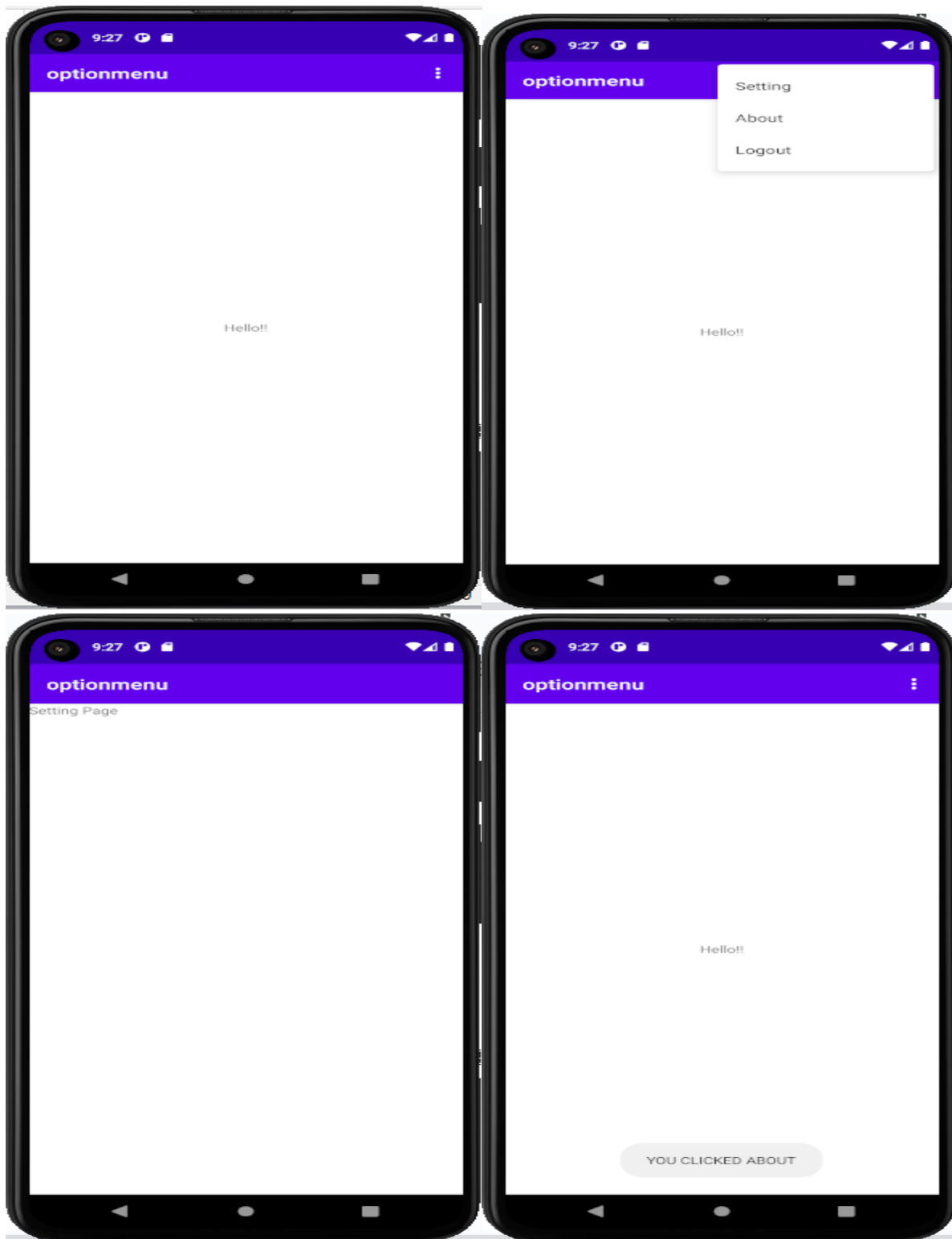
Result

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

MainActivity.java

```java
package com.example.exp10;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
  }
  public void switchActivity(View view) {
    TextView text = findViewById(R.id.e);
    TextView text2 = findViewById(R.id.e1);
    String data=text.getText().toString();
    String data2=text2.getText().toString();
    Intent intent = new Intent(this, MainActivity2.class);
    intent.putExtra("key",data );
    intent.putExtra("key2", data2);
    startActivity(intent);
  }
}
```

MainActivity2.java

```java
package com.example.exp10;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;
public class MainActivity2 extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
        Intent intent = getIntent();
        String receivedData = intent.getStringExtra("key");
        String receivedData2 = intent.getStringExtra("key2");
        TextView data = findViewById(R.id.t1); // replace with the actual ID of your TextView
        data.setText(receivedData);
        TextView data2 = findViewById(R.id.t2); // replace with the actual ID of your TextView
        data2.setText(receivedData2);
    }
}
```

Activity_main.xml

```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/e"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:inputType="text"
        android:hint="enter the name" />
    <EditText
        android:id="@+id/e1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:inputType="text"
        android:hint="enter the age"/>
    <Button
        android:id="@+id/b1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:onClick="switchActivity"
        android:text="Submit" />
</LinearLayout>
```

Activity_main2.xml

```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">
<TextView
    android:id="@+id/t1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="TextView"
    tools:layout_editor_absoluteX="181dp"
    tools:layout_editor_absoluteY="190dp" />
<TextView
    android:id="@+id/t2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="TextView"
    tools:layout_editor_absoluteX="175dp"
    tools:layout_editor_absoluteY="237dp" /></LinearLayout>
```

Output
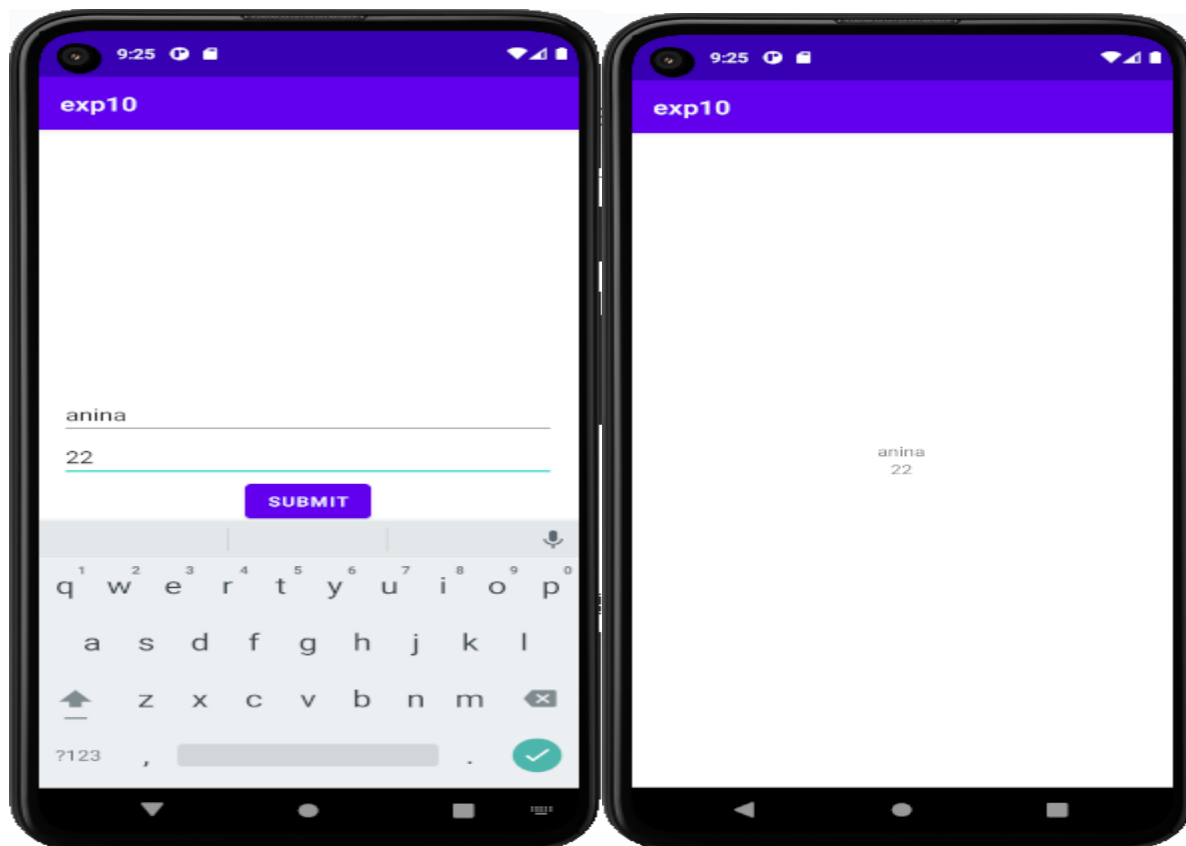
Result

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

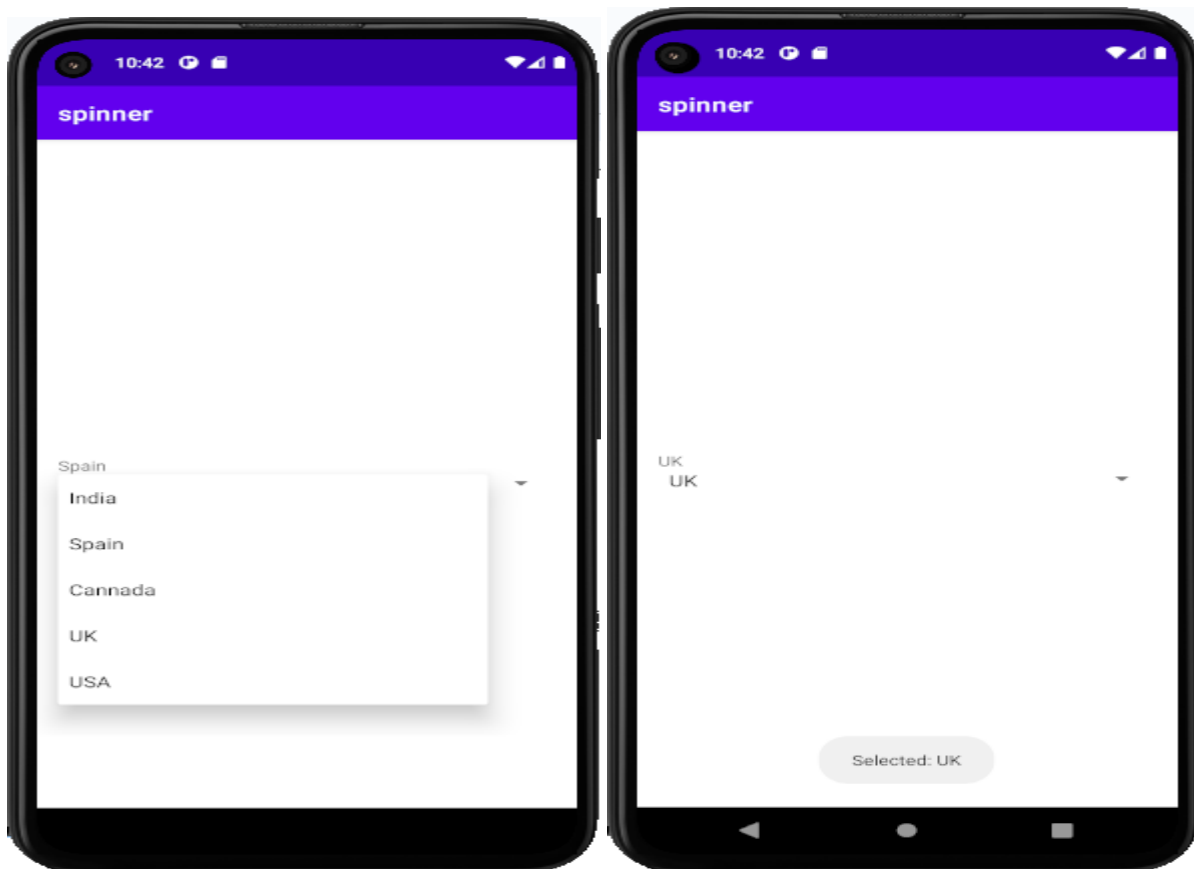To what extent you are able to implement activities applying themes.

Procedure

MainActivity.java

```
package com.example.spinner;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import java.util.ArrayList;
import java.util.List;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    Spinner spinner = findViewById(R.id.spinner);
    TextView tv=findViewById(R.id.t);
    final String[] items = {"India", "Spain", "Cannada", "UK", "USA"};
    ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
        android.R.layout.simple_spinner_item, items);
    adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
    spinner.setAdapter(adapter);
    spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
      @Override
      public void onItemSelected(AdapterView<?> parent, View view, int position, long id) {
        String selectedItem = items[position];
        tv.setText(selectedItem);
        Toast.makeText(MainActivity.this, "Selected: " + selectedItem,
Toast.LENGTH_SHORT).show();
      }
    });
  }
}
```
Activity_main.xml

```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">
    <TextView
        android:id="@+id/t"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="COUNTRY" />
    <Spinner
        android:id="@+id/spinner"
        android:layout_width="match_parent"
        android:layout_height="17dp" /></LinearLayout>
```

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

MainActivity.java

```java
package com.example.fragemt;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;

public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    findViewById(R.id.button).setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        getSupportFragmentManager().beginTransaction()
            .replace(R.id.fragment_container, new fragment1())
            .commit();
      }
    });
    findViewById(R.id.button2).setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        getSupportFragmentManager().beginTransaction()
            .replace(R.id.fragment_container, new fragment2())
            .commit();
      }
    });
  }
}
```

Activity_main.xml

<*?*xml version="1.0" encoding="utf-8"*?*>

```xml
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="130dp"
        android:layout_marginTop="60dp"
        android:text="Fragment 1" />
    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/button"
        android:layout_marginStart="130dp"
        android:layout_marginTop="150dp"
        android:text="Fragment 2" />
    <FrameLayout
        android:id="@+id/fragment_container"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_margin="16dp" />
</FrameLayout>
```

Fragment1.java

```java
public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
    return inflater.inflate(R.layout.fragment_blank, container, false);
}
```

Fragment2.java

```java
public View onCreateView(LayoutInflater inflater, ViewGroup container,
            Bundle savedInstanceState) {
    return inflater.inflate(R.layout.fragment_fragment2, container, false);
}
```

Output
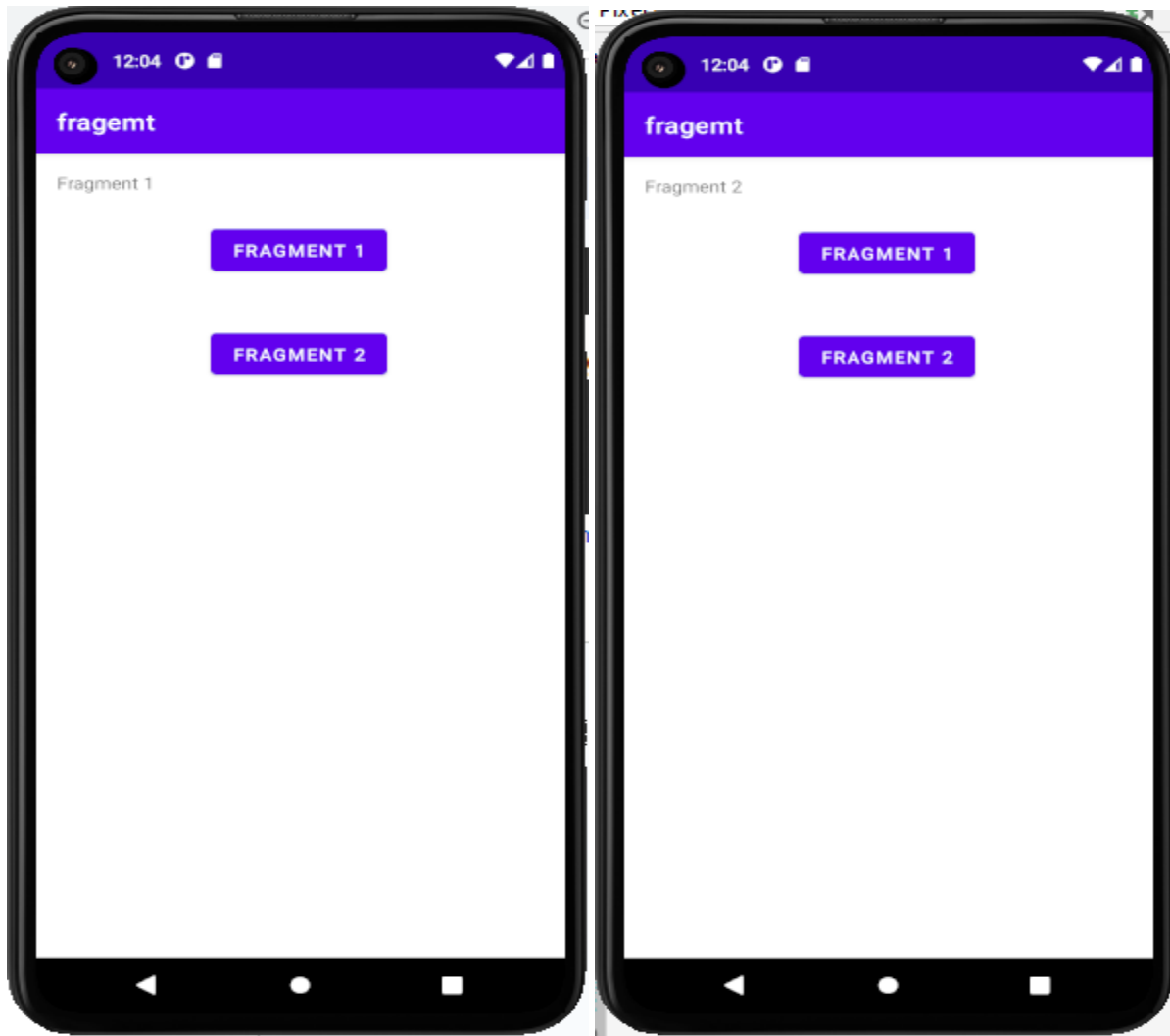
Result

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

```java
package com.example.excephandle;
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("ITEM 1");
    list.add("ITEM 2");
    list.add("ITEM 3");
    list.add("ITEM 4");
    for (int i=0;i<5;i++) {

    try {
       list.get(i);
    } catch (Exception e) {
       Toast.makeText(this,"Exception Caught", Toast.LENGTH_LONG).show();
    }
  }
  }
}
```

Activity_main.xml

```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">
<ListView
    android:id="@+id/t1"
    android:layout_width="409dp"
    android:layout_height="368dp"
    tools:layout_editor_absoluteX="1dp"
    tools:layout_editor_absoluteY="1dp" />

</RelativeLayout>
```

Output

Result

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

Experiment No.: 14

Aim

Apply themes via code and manifest file.

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">
  <EditText
    android:id="@+id/e1"
    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>
```

Color.xml
```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <color name="colorPrimary">#FFEB3B</color>
  <color name="color_primary_dark">#EE0000</color>
  <color name="color_accent">#E91E63</color>
  <color name="color_text_color_primary">#1C7985</color>
</resources>
```

Themes.xml
```
<resources xmlns:tools="http://schemas.android.com/tools">
  <!-- Base application theme. -->
  <style name="Theme.Al" parent="Theme.MaterialComponents.DayNight.DarkActionBar">
    <item name="colorPrimary">@color/colorPrimary</item>
    <item name="colorPrimaryDark">@color/color_primary_dark</item>
    <item name="colorAccent">@color/color_accent</item>
```

```xml
    <item name="android:textColorPrimary">@color/color_text_color_primary</item>
    <item name="android:textSize">40dp</item>
  </style>
</resources>
```

New_style.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <style name="Theme.new_style"
parent="Theme.MaterialComponents.DayNight.DarkActionBar">
    <item name="colorPrimary">@color/colorPrimary</item>
    <item name="colorPrimaryDark">@color/color_primary_dark</item>
    <item name="colorAccent">@color/color_accent</item>
    <item name="android:textColorPrimary">@color/color_text_color_primary</item>
    <item name="android:textSize">40dp</item>
  </style>
</resources>
```

Androidmanifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  package="com.example.al">

  <application
    android:allowBackup="true"
    android:dataExtractionRules="@xml/data_extraction_rules"
    android:fullBackupContent="@xml/backup_rules"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/Theme.new_style"

    tools:targetApi="31">
    <activity
      android:name=".MainActivity"
      android:exported="true">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  </application>
</manifest>
```
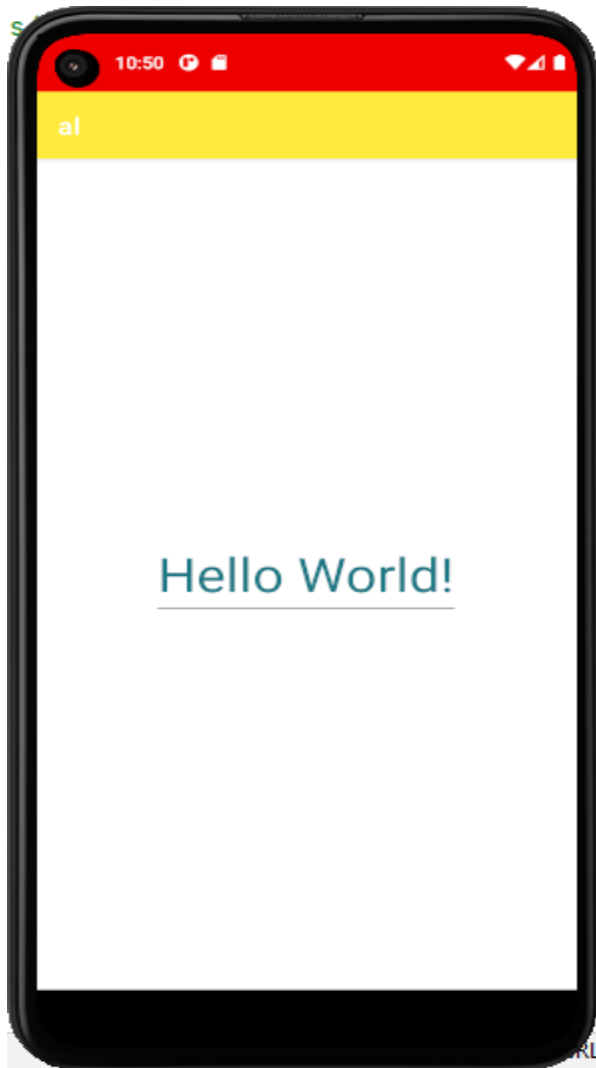
Output

Result

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

Experiment No.: 15

Aim

Create database using SQLite and perform INSERT and SELECT

CO5

Develop mobile applications using SQLite.

Procedure

MainActivity.java

```java
package com.example.curd;

import androidx.appcompat.app.AppCompatActivity;

import android.content.ContentValues;

import android.database.Cursor;

import android.database.SQLException;

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 tx;

    EditText et1, et2, et3;

    Button b1, b2, b3, b4;

    String rno, name, dept;

    SQLiteDatabase db;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);
```

```java
    setContentView(R.layout.activity_main);

    tx = findViewById(R.id.tv);

    et1 = findViewById(R.id.e1);

    et2 = findViewById(R.id.e2);

    et3 = findViewById(R.id.e3);

    b1 = findViewById(R.id.button);

    b2 = findViewById(R.id.button2);

    b3 = findViewById(R.id.button3);

    b4 = findViewById(R.id.button4);

    DBHelper dbHelper = new DBHelper(this);

    db = dbHelper.getWritableDatabase();

}

public void onView(View view) {

    Cursor cursor = db.rawQuery("SELECT * FROM student", null);

    StringBuilder data = new StringBuilder();

    while (cursor.moveToNext()) {

        data.append("\n").append(cursor.getString(0));

        data.append("\n").append(cursor.getString(1));

        data.append("\n").append(cursor.getString(2));

    }

    if (data.length() > 0) {

        Toast.makeText(this, "Data Found: " + data.toString(), Toast.LENGTH_LONG).show();

    } else {

        Toast.makeText(this, "No Data Found", Toast.LENGTH_LONG).show();

    }

    cursor.close(); // Close the cursor after using it

}

 public void onInsert(View view) {

    rno = et1.getText().toString().trim();

    name = et2.getText().toString().trim();

    dept = et3.getText().toString().trim();
```

```java
    if (rno.isEmpty() || name.isEmpty() || dept.isEmpty()) {

        Toast.makeText(this, "PLEASE ENTER VALUES", Toast.LENGTH_LONG).show();

    } else {

        ContentValues values = new ContentValues();

        values.put("rollno", rno);

        values.put("name", name);

        values.put("dept", dept);

        try {

            long newRowId = db.insertOrThrow("student", null, values);


            if (newRowId != -1) {

                Toast.makeText(this, "INSERTED", Toast.LENGTH_LONG).show();

            } else {

                Toast.makeText(this, "Failed to insert", Toast.LENGTH_LONG).show();

            }

        } catch (SQLException e) {

            Toast.makeText(this, "Insertion Error: " + e.getMessage(),
Toast.LENGTH_LONG).show();

            e.printStackTrace();

        }

    }

}

@Override

protected void onDestroy() {

    super.onDestroy();

    if (db != null && db.isOpen()) {

        db.close();

    }

}
}
```

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/tv"

    android:layout_width="108dp"

    android:layout_height="47dp"

    android:layout_centerHorizontal="true"

    android:text="Student Detail" />

  <EditText

    android:id="@+id/e1"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_below="@+id/tv"

    android:layout_centerHorizontal="true"

    android:hint="Roll No:" />

  <EditText

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:hint="Student Name:"

    android:layout_centerHorizontal="true"

    android:id="@+id/e2"

    android:layout_below="@+id/e1"/>

  <EditText

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

```
    android:hint="Department"

    android:layout_centerHorizontal="true"

    android:id="@+id/e3"

    android:layout_below="@+id/e2"/>

  <Button

    android:id="@+id/button"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_below="@+id/e3"

    android:layout_centerHorizontal="true"

    android:onClick="onInsert"

    android:text="Insert" />

  <Button

    android:id="@+id/button2"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_centerHorizontal="true"

    android:text="View"

    android:onClick="onView"

    android:layout_below="@+id/button"/>

  <Button

    android:id="@+id/button3"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_centerHorizontal="true"

    android:text="Update"

    android:onClick="onUpdate"

    android:layout_below="@+id/button2"/>

  <Button

    android:id="@+id/button4"

    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"

        android:layout_centerHorizontal="true"

        android:text="Delete"

        android:onClick="onDelete"

        android:layout_below="@+id/button3"/>

</RelativeLayout>
```

DBHelper.java

```java
package com.example.curd;

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(5))");

  }

  @Override

  public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {

    sqLiteDatabase.execSQL("drop table if exists student");

    onCreate(sqLiteDatabase);

  }

}
```
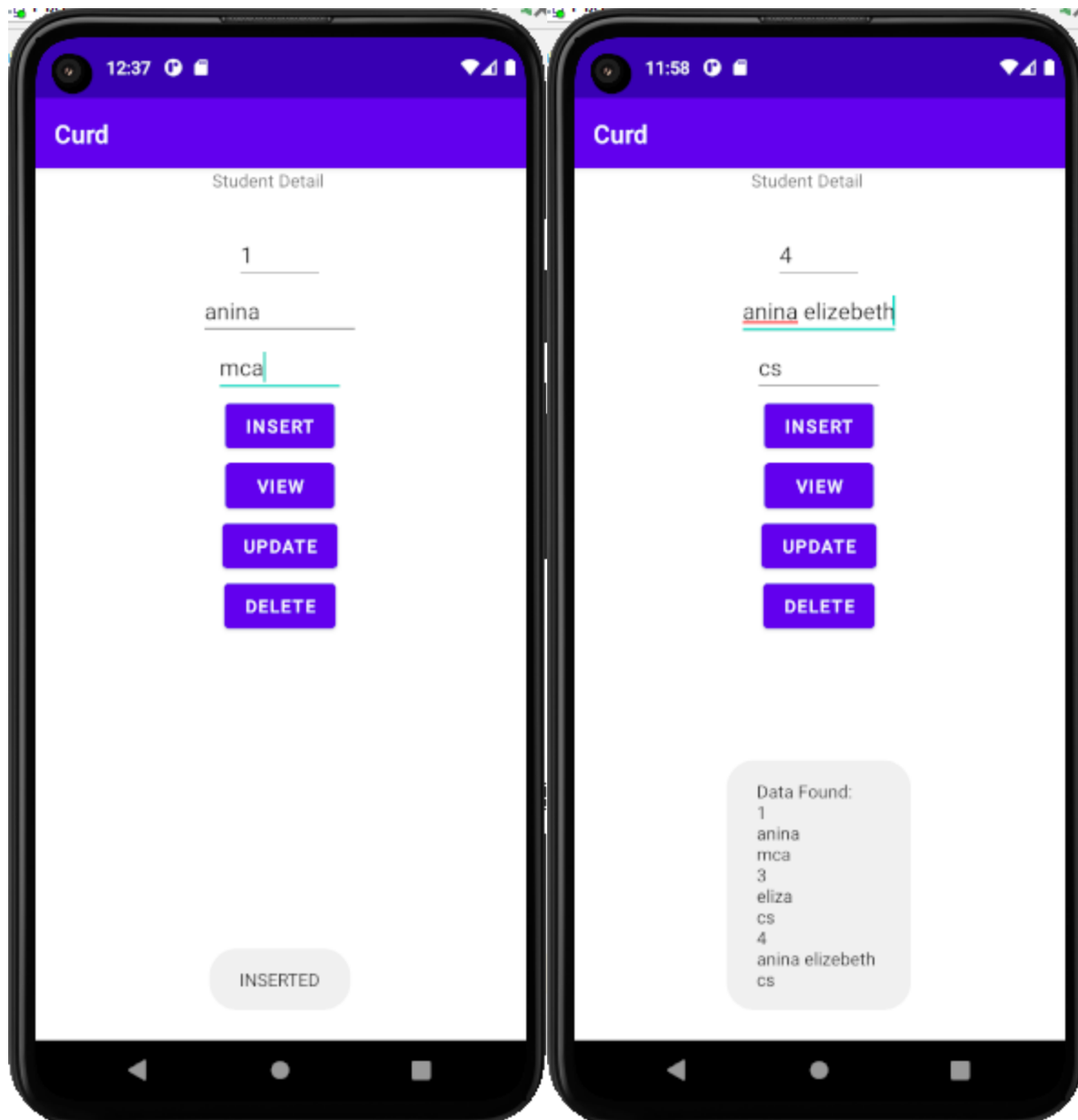
Output

Result

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

Experiment No.: 16

Aim

Perform UPDATE and DELETE on SQLite database

CO5

Develop mobile applications using SQLite.

Procedure

MainActivity.java

```java
package com.example.curd;

import androidx.appcompat.app.AppCompatActivity;

import android.content.ContentValues;

import android.database.Cursor;

import android.database.SQLException;

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 tx;

    EditText et1, et2, et3;

    Button b1, b2, b3, b4;

    String rno, name, dept;

    SQLiteDatabase db;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);
```

```java
    tx = findViewById(R.id.tv);

    et1 = findViewById(R.id.e1);

    et2 = findViewById(R.id.e2);

    et3 = findViewById(R.id.e3);

    b1 = findViewById(R.id.button);

    b2 = findViewById(R.id.button2);

    b3 = findViewById(R.id.button3);

    b4 = findViewById(R.id.button4);

    DBHelper dbHelper = new DBHelper(this);

    db = dbHelper.getWritableDatabase();

  }
public void onUpdate(View view) {

    rno = et1.getText().toString();

    name = et2.getText().toString();

    dept = et3.getText().toString();

    if (rno.isEmpty() || name.isEmpty() || dept.isEmpty()) {

      Toast.makeText(this, "PLEASE ENTER VALUES", Toast.LENGTH_LONG).show();

    } else {

      ContentValues values = new ContentValues();

      values.put("rollno", rno);

      values.put("name", name);

      values.put("dept", dept);

      int rowsAffected = db.update("student", values, "rollno=?", new String[]{rno});

      if (rowsAffected > 0) {

        Toast.makeText(this, "UPDATED", Toast.LENGTH_LONG).show();

      } else {

        Toast.makeText(this, "No record found for roll number: " + rno,
Toast.LENGTH_LONG).show();

      }

    }

  }
```

```java
  public void onDelete(View view) {

    rno = et1.getText().toString();

    if (rno.isEmpty()) {

      Toast.makeText(this, "PLEASE ENTER ROLLNO TO DELETE",
Toast.LENGTH_LONG).show();

    } else {

      int rowsDeleted = db.delete("student", "rollno="+rno, null);

      if (rowsDeleted > 0) {

        Toast.makeText(this, "DELETED", Toast.LENGTH_LONG).show();

      } else {

        Toast.makeText(this, "Failed to delete", Toast.LENGTH_LONG).show();

      }

    }

  }
```

Activity_main.xml

```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/tv"

    android:layout_width="108dp"

    android:layout_height="47dp"

    android:layout_centerHorizontal="true"

    android:text="Student Detail" />

  <EditText

    android:id="@+id/e1"

    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"

    android:layout_below="@+id/tv"

    android:layout_centerHorizontal="true"

    android:hint="Roll No:" />

  <EditText

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:hint="Student Name:"

    android:layout_centerHorizontal="true"

    android:id="@+id/e2"

    android:layout_below="@+id/e1"/>

  <EditText

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:hint="Department"

    android:layout_centerHorizontal="true"

    android:id="@+id/e3"

    android:layout_below="@+id/e2"/>

  <Button

    android:id="@+id/button"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_below="@+id/e3"

    android:layout_centerHorizontal="true"

    android:onClick="onInsert"

    android:text="Insert" />

  <Button

    android:id="@+id/button2"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_centerHorizontal="true"
```
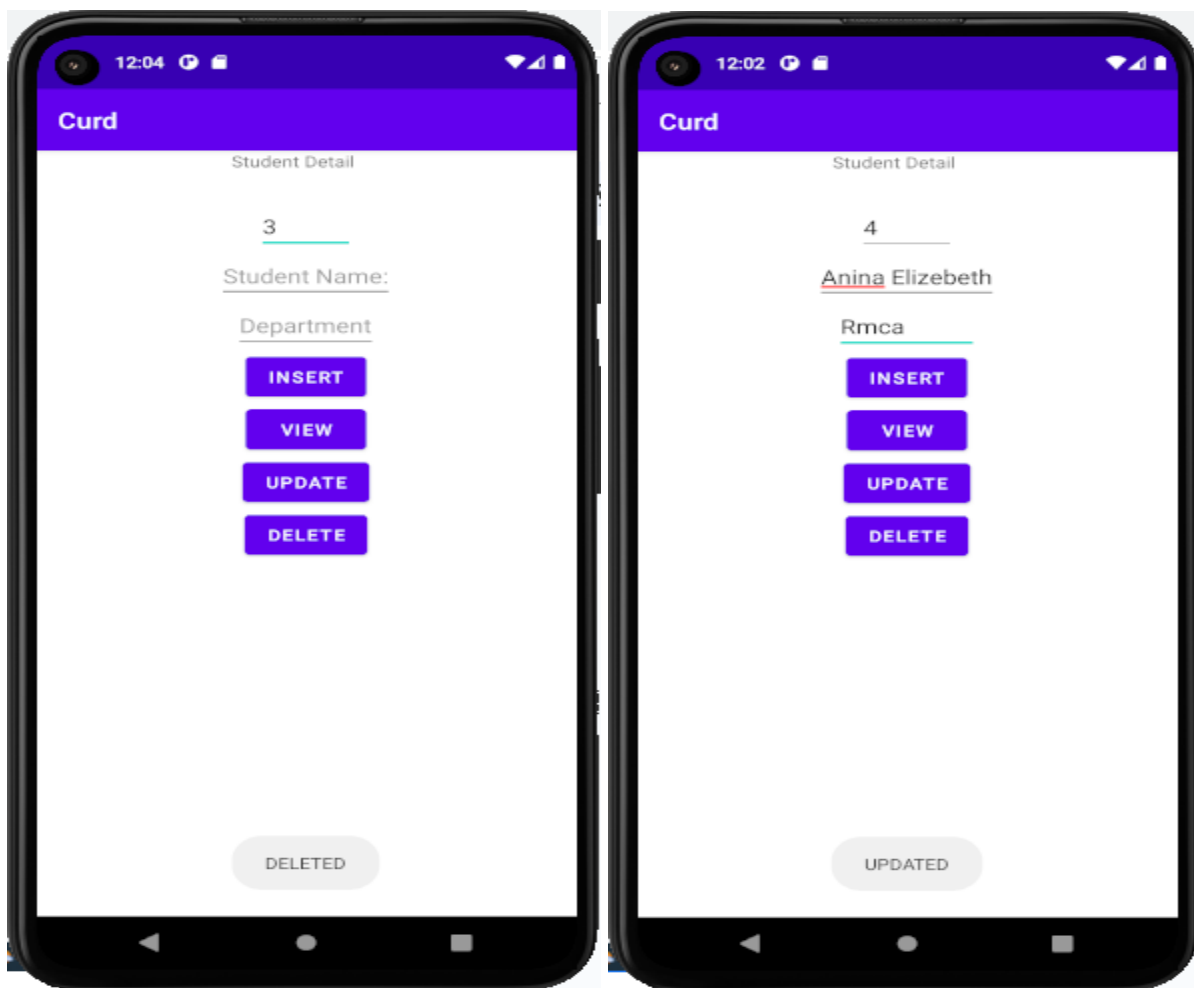
```xml
        android:text="View"

        android:onClick="onView"

        android:layout_below="@+id/button"/>

    <Button

        android:id="@+id/button3"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_centerHorizontal="true"

        android:text="Update"

        android:onClick="onUpdate"

        android:layout_below="@+id/button2"/>

    <Button

        android:id="@+id/button4"

        android:layout_width="wrap_content"

        android:layout_height="wrap_content"

        android:layout_centerHorizontal="true"

        android:text="Delete"

        android:onClick="onDelete"

        android:layout_below="@+id/button3"/>

</RelativeLayout>
```

DBHelper.java

```java
package com.example.curd;

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);

    }

    public void onCreate(SQLiteDatabase sqLiteDatabase) {
```

```
    sqLiteDatabase.execSQL("Create table student(rollno int,name varchar(20),dept
varchar(5))");

  }

  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.