

20MCA243 – Mobile Application Development Lab

Lab Report Submitted By

CHITHIRA C B

AJC22MCA-2036

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 **CHITHIRA C B (AJC22MCA-2036)** 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**.

Ms. Jetty Benjamin
Lab In-Charge

Rev. Fr. Dr. Rubin Thottupurathu Jose
Head of the Department

Internal Examiner

External Examiner

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

SL. NO.	LIST OF LAB EXPERIMENTS/EXERCISES	DATE	CO	PAGE NO
1	Design a Login Form with username and password using LinearLayout and toast valid Credentials	21-09-2023	CO1	1
2	Implementing basic arithmetic operations of a simple calculator	11-10-2023	CO1, CO2	5
3	Write a program that demonstrates Activity Lifecycle.	12-10-2023	CO1	15
4	Implement validations on various UI controls.	25-10-2023	CO1, CO2	19
5	Create a Facebook page using RelativeLayout; set properties using .xml file	26-10-2023	CO2	24
6	Develop an application that toggles image using FrameLayout	01-11-2023	CO2	30
7	Design a registration activity and store registration details in local memory of phone using Intents and SharedPreferences.	01-11-2023	CO2	33
8	Develop an application that uses ArrayAdapter with ListView.	09-11-2023	CO3	37
9	Implement Options Menu to navigate to activities	09-11-2023	CO3	40
10	Develop application that works with explicit intents	16-11-2023	CO3	43
11	Develop an application that implements Spinner component and perform event Handling	16-11-2023	CO4	46
12	Develop an application using fragments	22-11-2023	CO4	48
13	Implement Adapters and perform exception handling	23-11-2023	CO4	51
14	Create database using SQLite and perform INSERT and SELECT	04-12-2023	CO5	53
15	Perform UPDATE and DELETE on SQLite database	06-12-2023	CO5	60

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**

```
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");
}
});
}

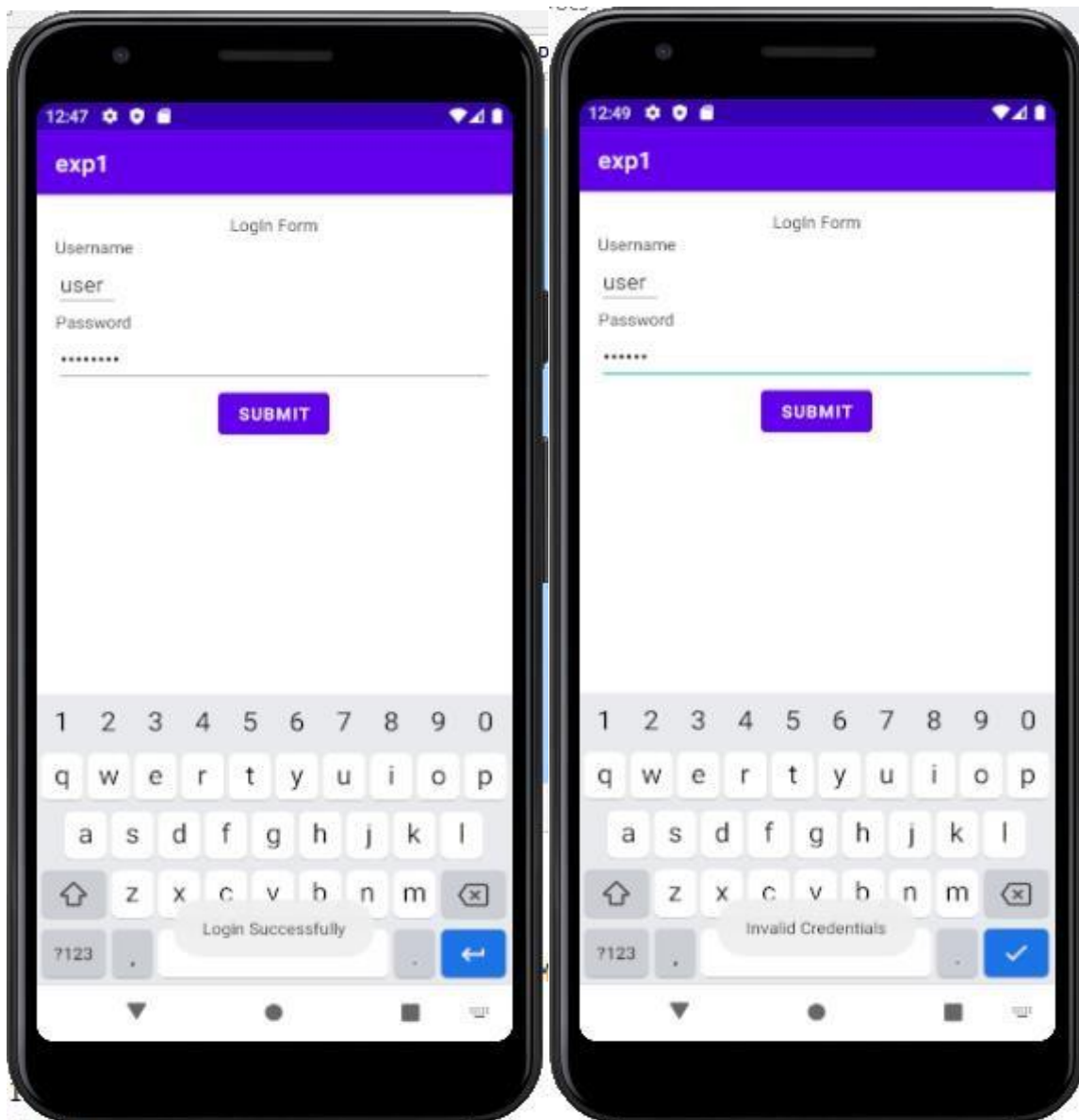
private boolean isValidCredentials(String enteredUsername, String enetredPassword) {
    return validUser.equals(enteredUsername) && validPass.equals(enetredPassword);
}
```

Activity_main.xml

```
<?xml 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**

```
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;
```

```
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="";
    }
}
```

```
}  
  
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 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

```
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
```

```
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

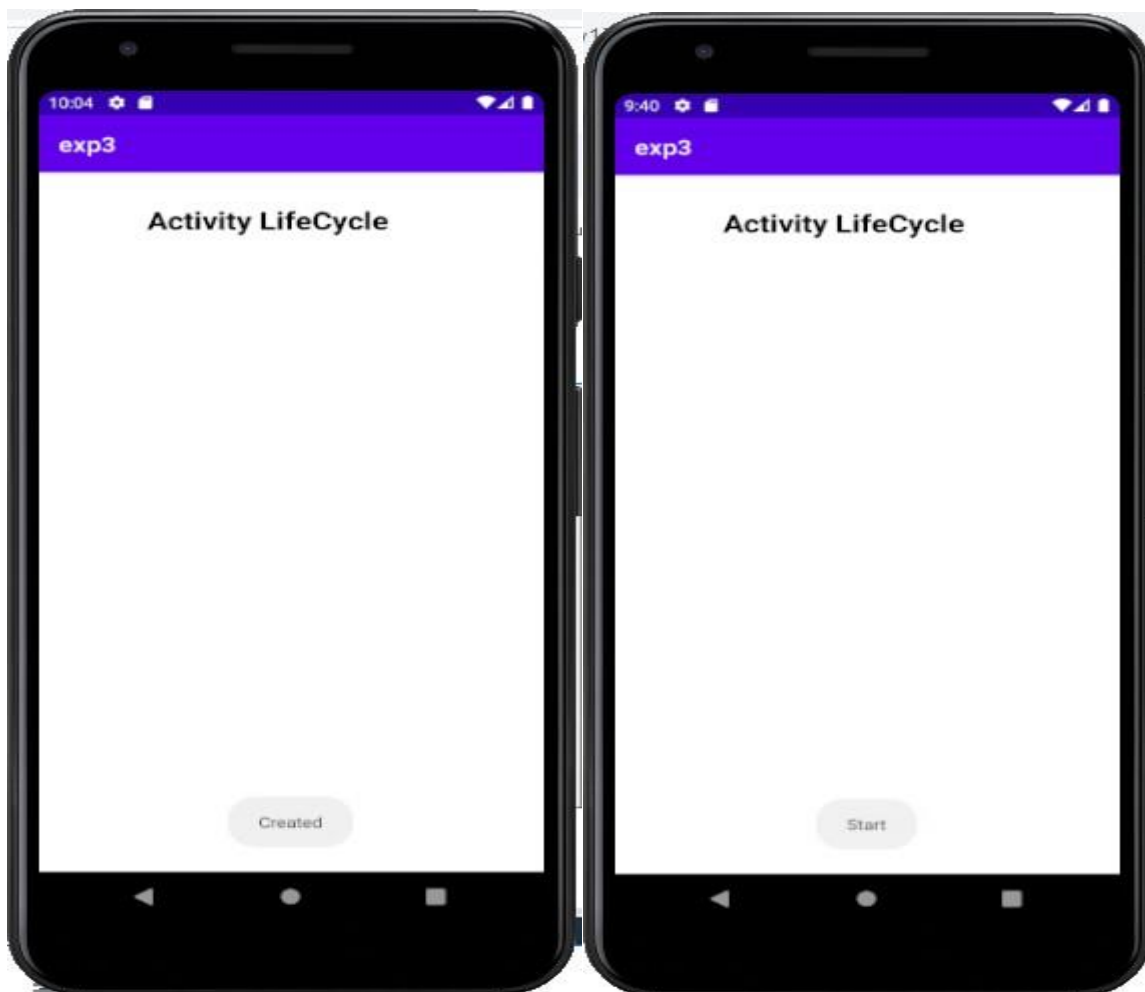
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="30dp"
    android:gravity="center_horizontal">
```

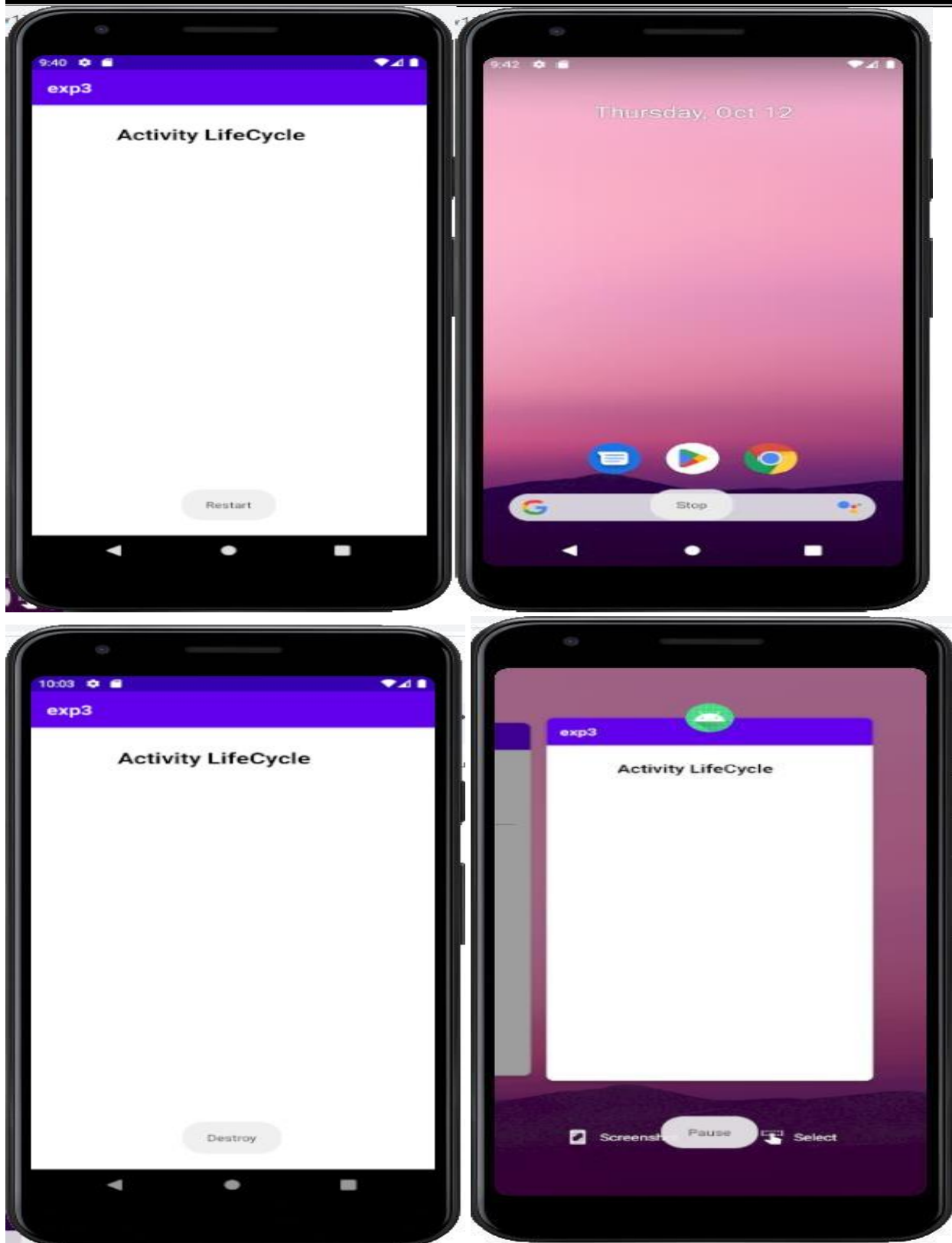
```
<TextView
```

```
    android:id="@+id/TextView1"  
    android:layout_width="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

```
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() {
```

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

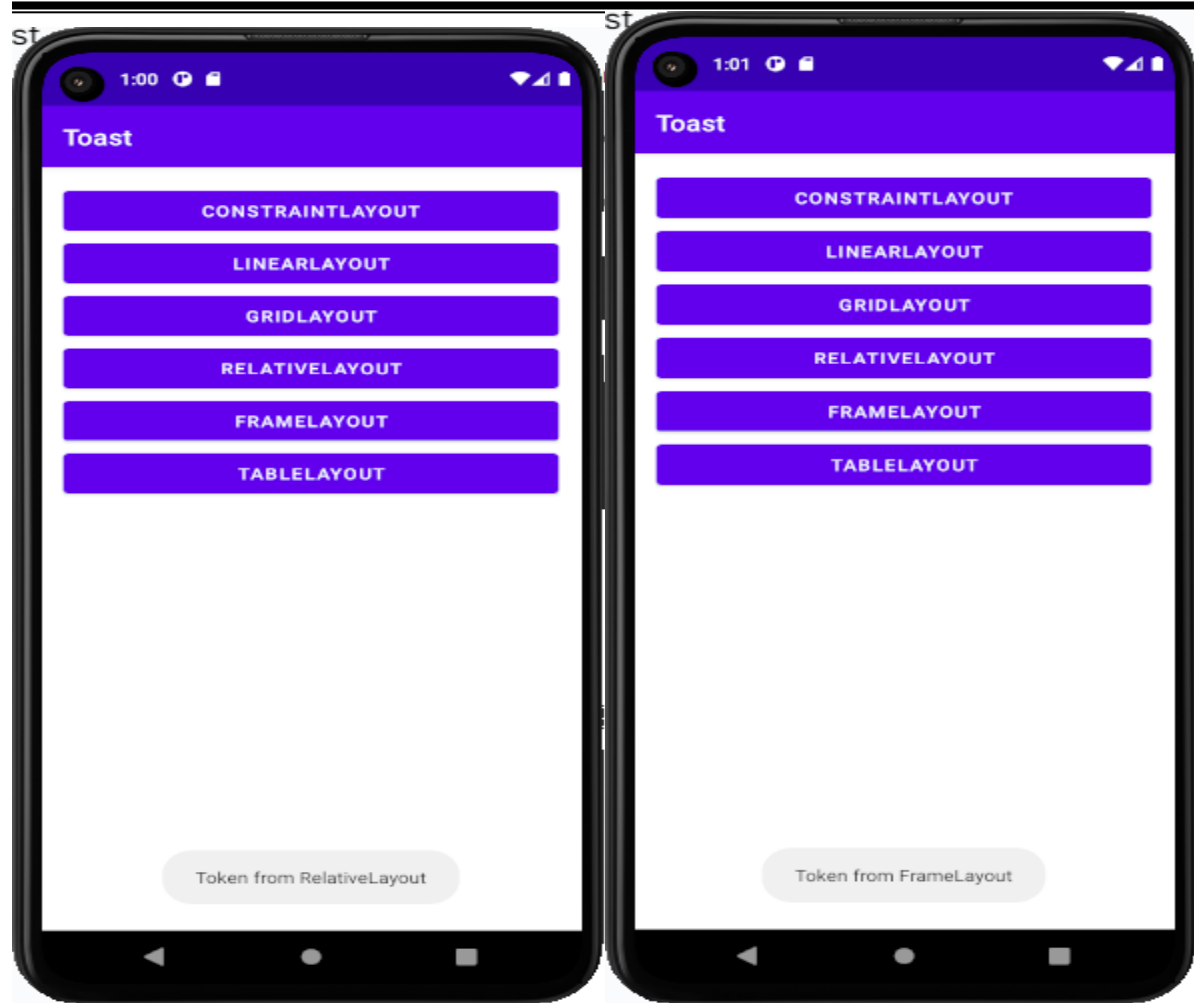
Activity_main.xml

```
<?xml 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>
```

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**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);
        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"
```

```
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" />
```

```
<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
```

```
        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**

```
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 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">

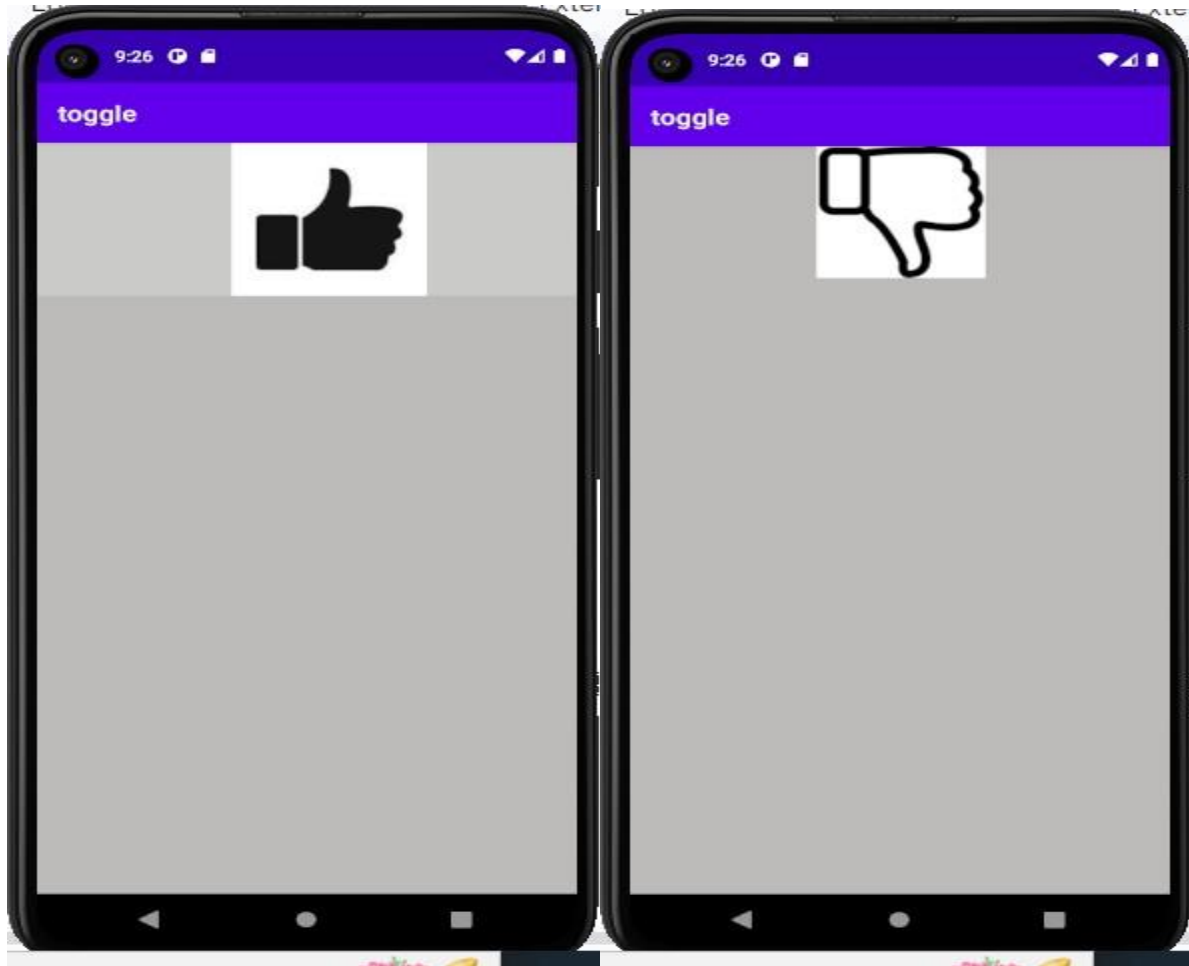
    <ImageView
        android:id="@+id/imageView1"
        android:layout_width="427dp"
        android:layout_height="wrap_content"
        android:layout_gravity="left|top"
        android:background="#CACAC8"
        app:srcCompat="@drawable/img" />

    <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**

```
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);
```

```
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 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"

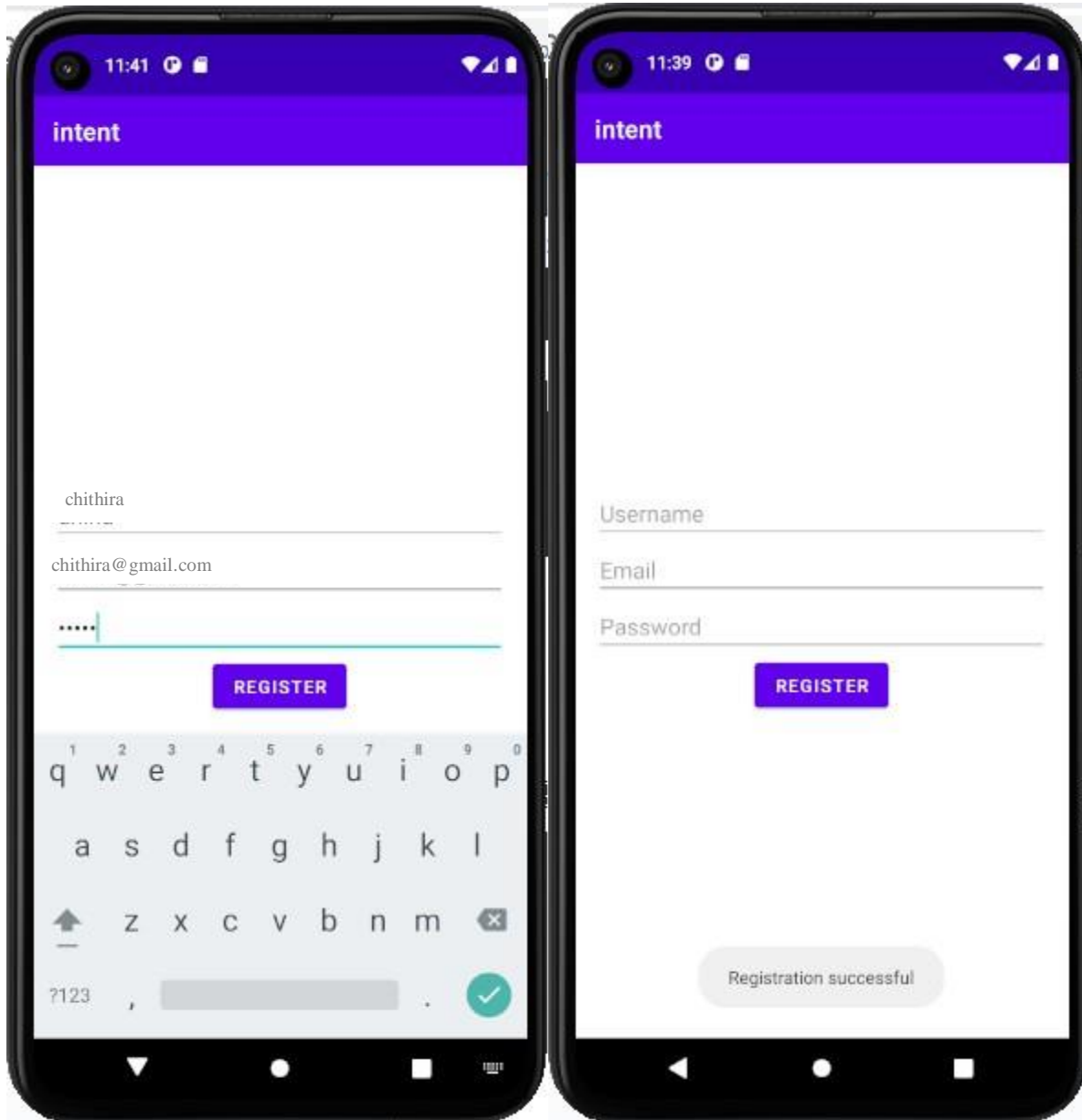
    android:layout_height="match_parent"

    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>
```

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);

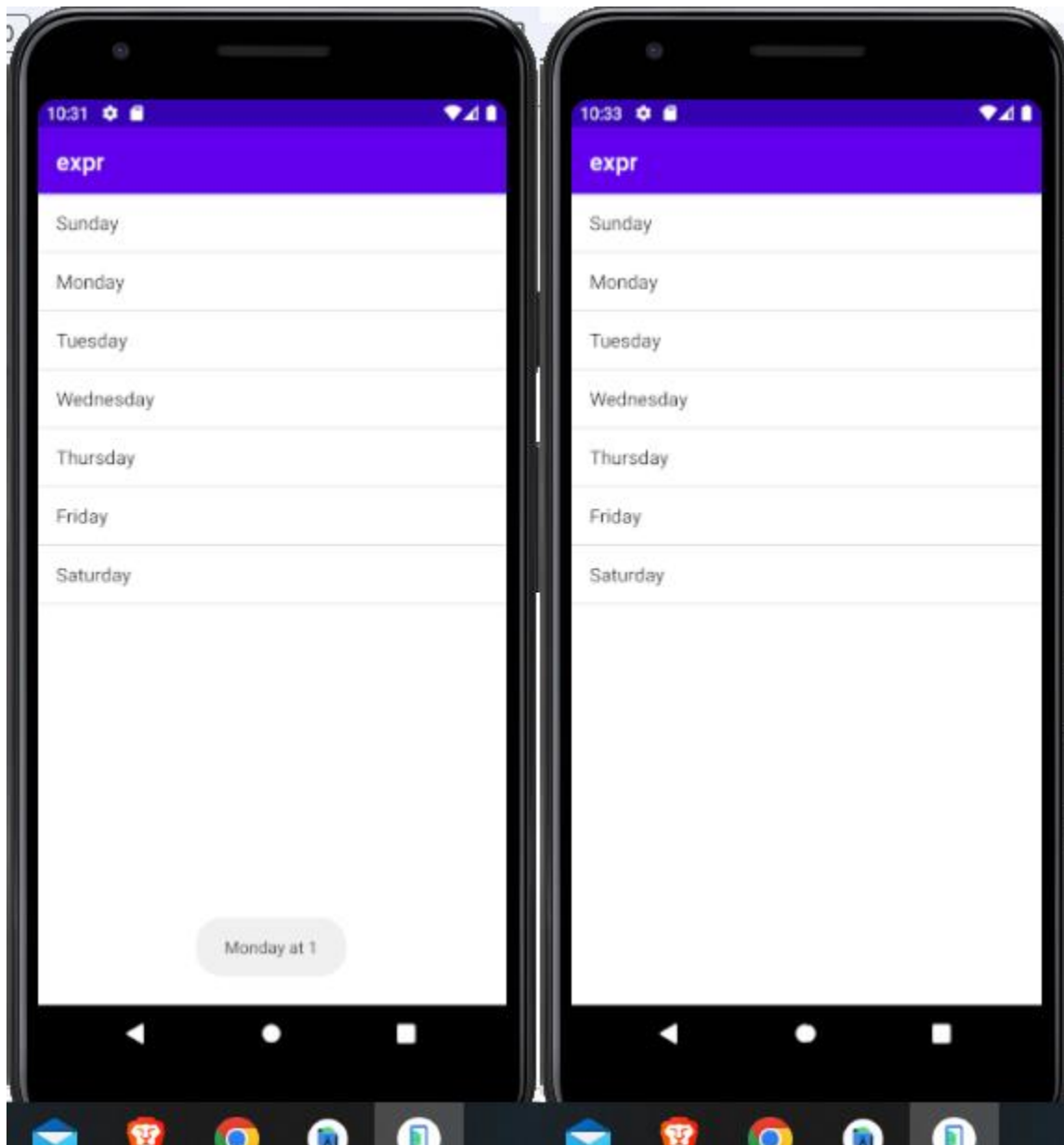
        ArrayAdapter<String> adapter = new
ArrayAdapter<>(this, android.R.layout.simple_list_item_1, data);
```

```
        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

```
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);
    }
}
```

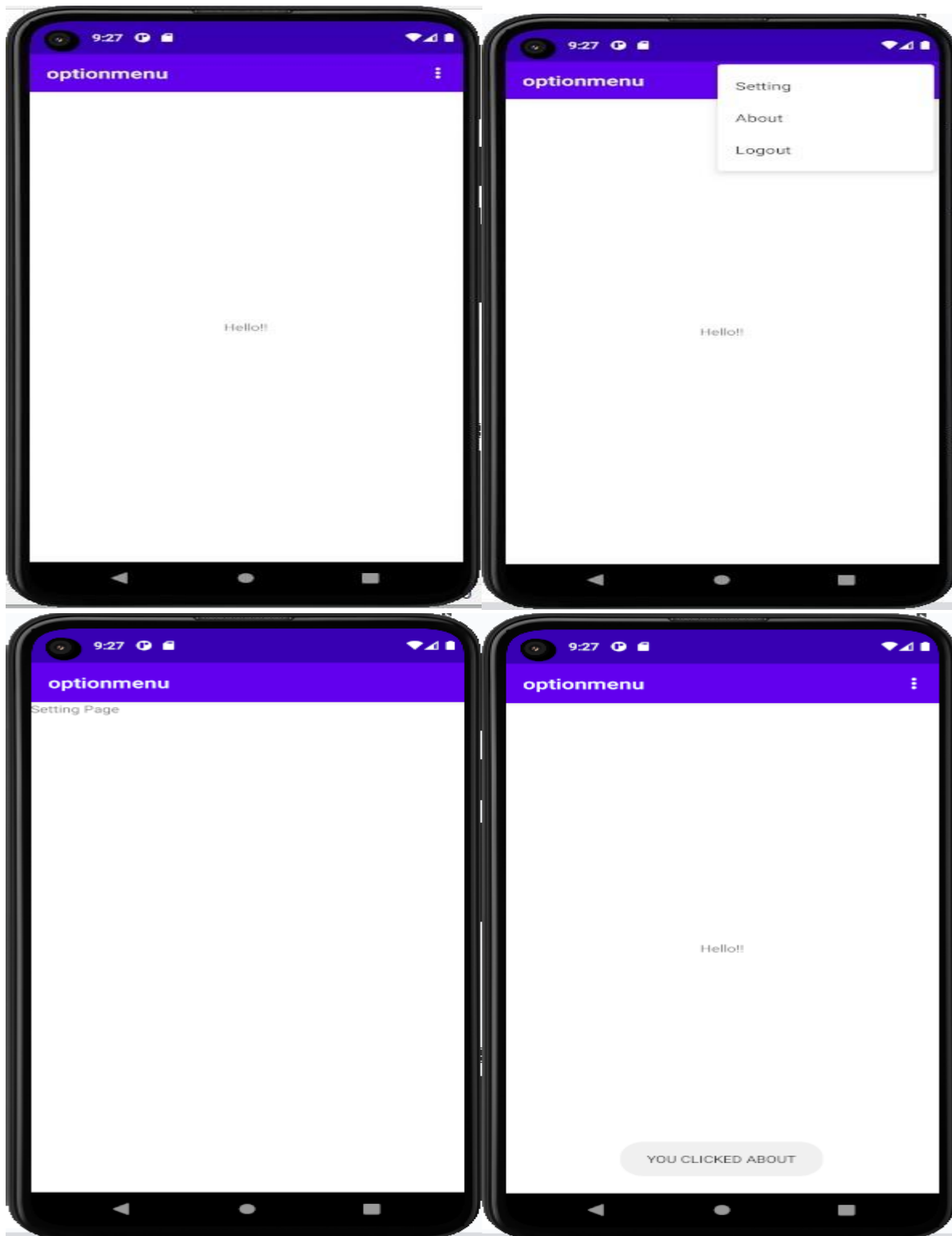
@Override

```
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 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

```
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

```
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 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

```

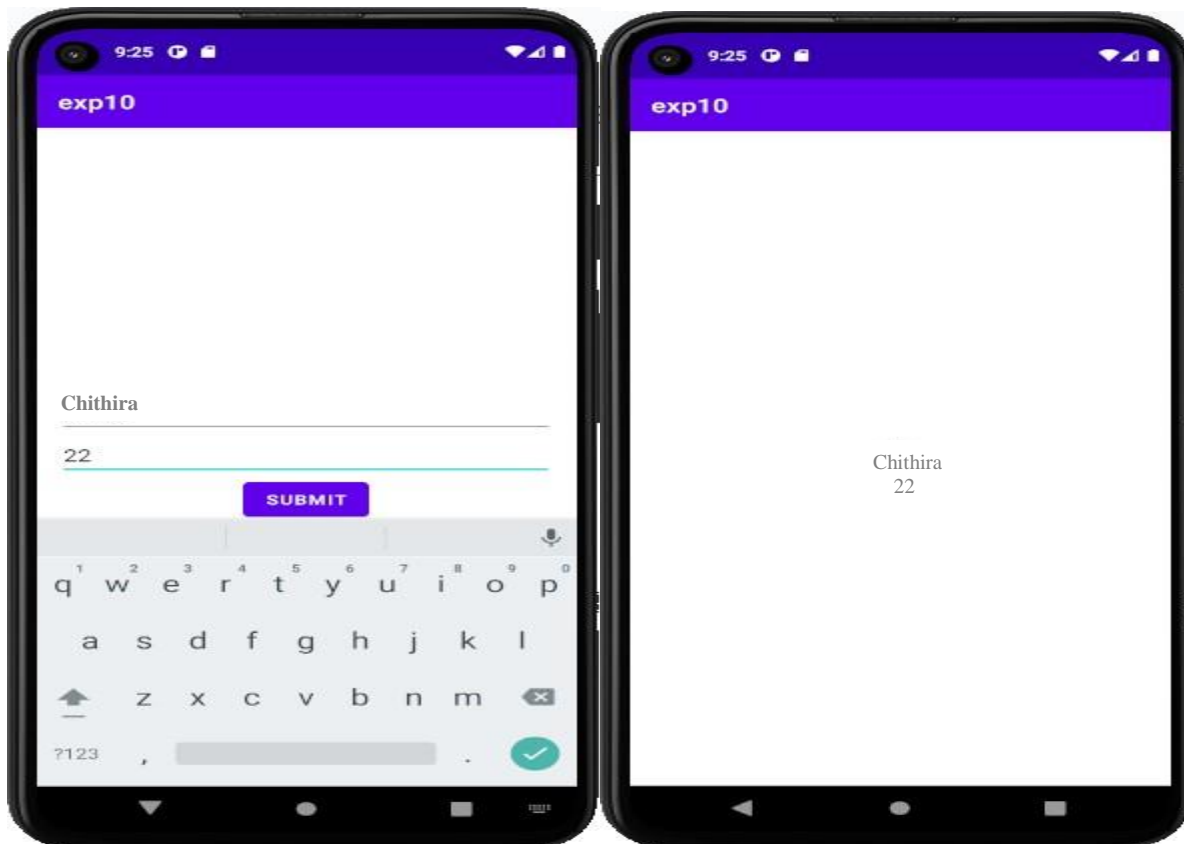
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"

```



```
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

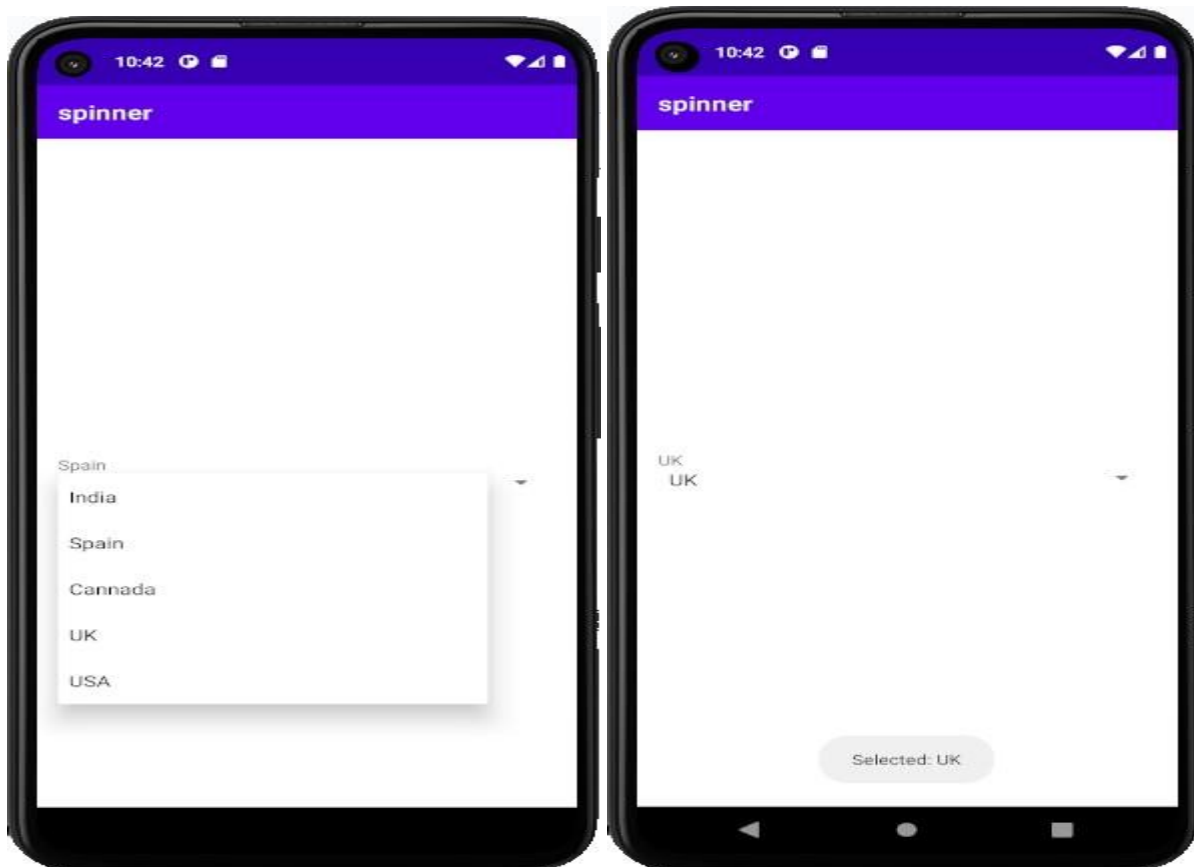
MainActivity.java

```
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.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(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 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**

```
package com.example.fragment;
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"?>
```

```
<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>
```

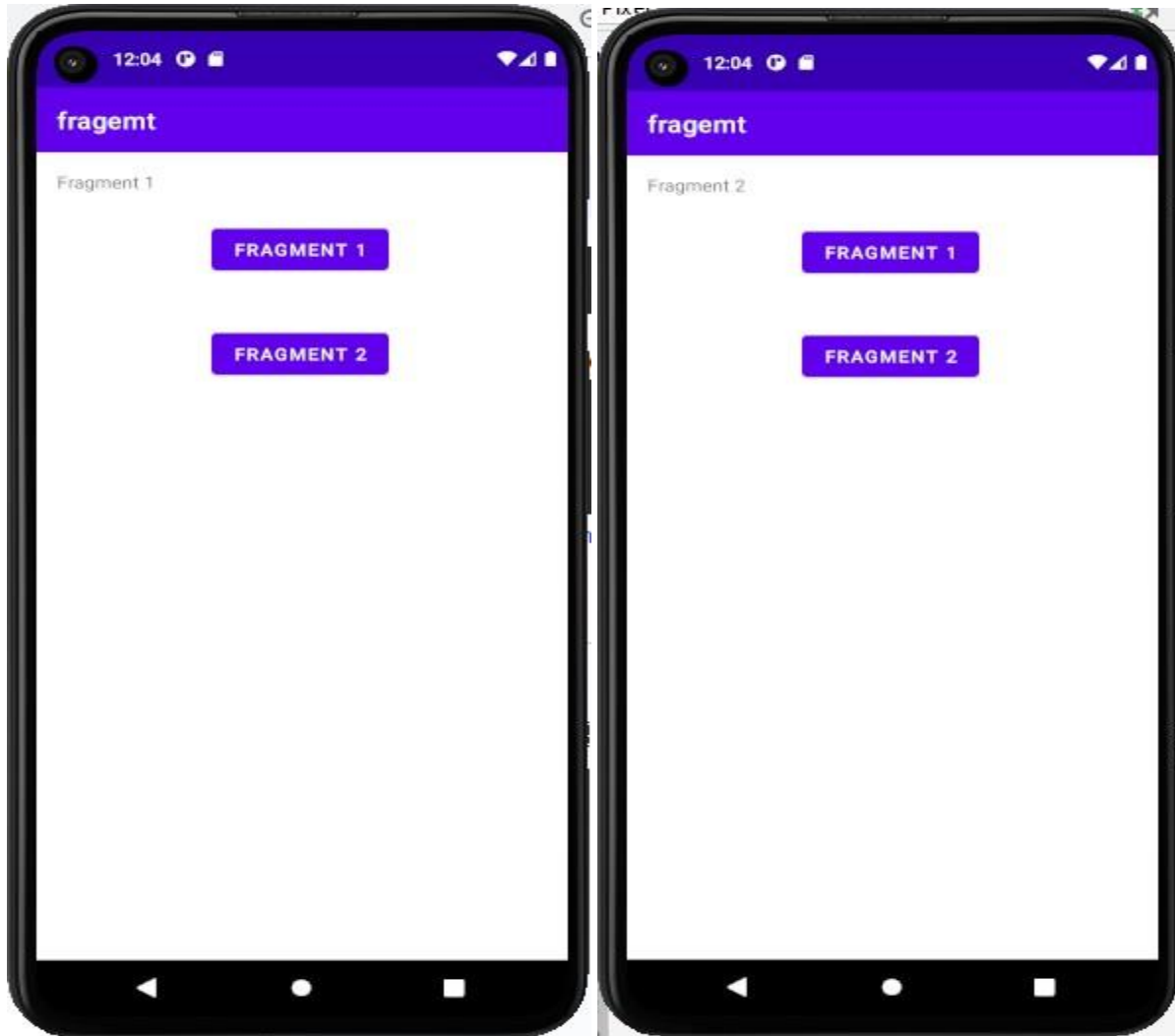
Fragment1.java

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

Fragment2.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

```
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 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**

Create database using SQLite and perform INSERT and SELECT

CO5

Develop mobile applications using SQLite.

Procedure**MainActivity.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);

        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();
```

```
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"
```

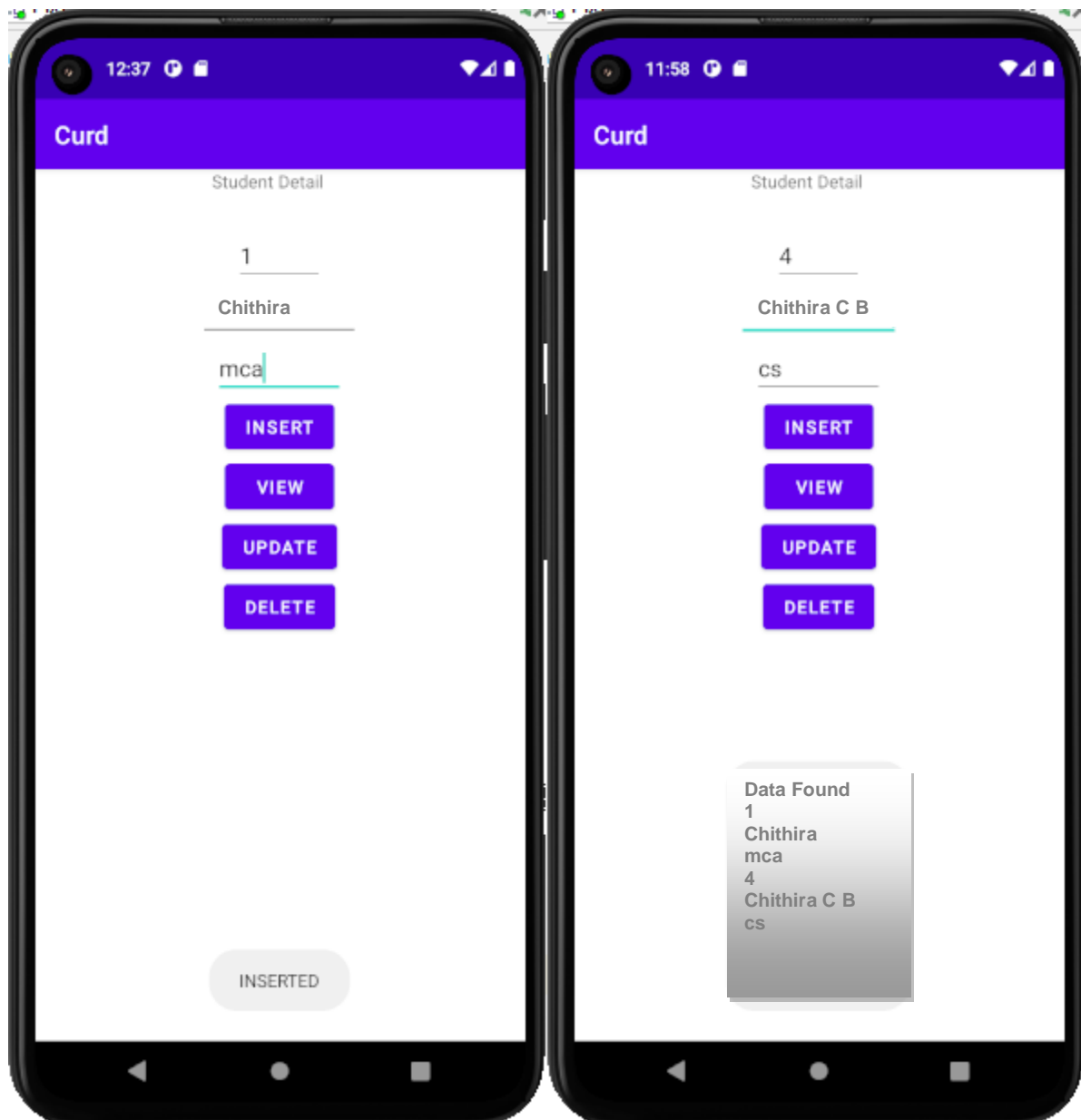
```
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:text="Delete"
        android:onClick="onDelete"
        android:layout_below="@+id/button3"/>
```

</RelativeLayout>

DBHelper.java

```
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.: 15**Aim**

Perform UPDATE and DELETE on SQLite database

CO5

Develop mobile applications using SQLite.

Procedure**MainActivity.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);
    }
}
```

```
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();
        }
    }
}
```

```
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 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"
```

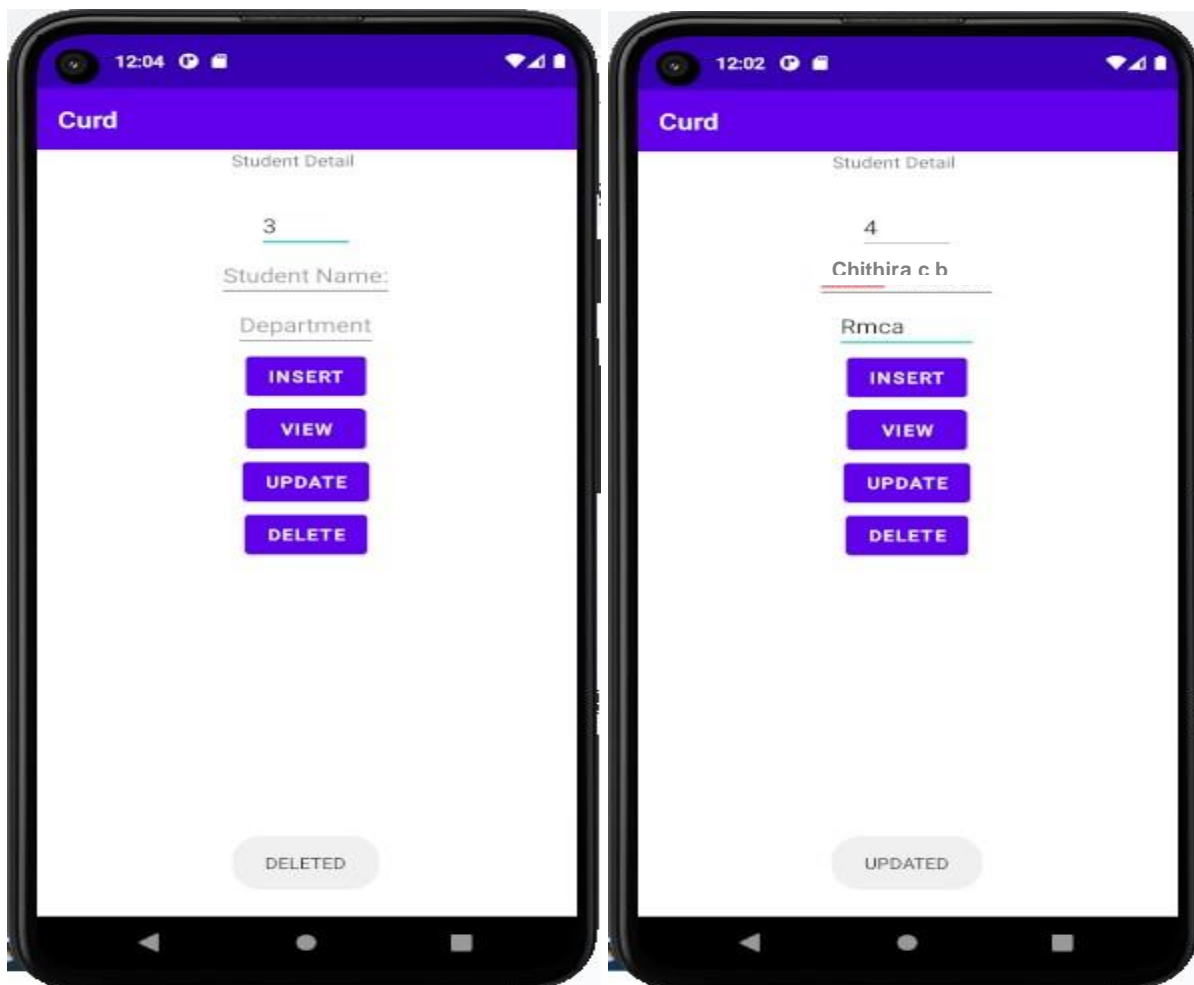
```
        android:text="View"
        android:onClick="onView"
        android:layout_below="@+id/button"/>
<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:text="Update"
    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

```
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.