20MCA243 – Mobile Application Development Lab

Lab Report Submitted By

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AJC22MCA-2044

In Partial Fulfilment for the Award of the Degree Of

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

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

2022-2024

DEPARTMENT OF COMPUTER APPLICATIONS

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

CERTIFICATE

This is to certify that the lab report, "**20MCA243 – Mobile Application Development Lab"** is the bonafide work of **FATHIMA HAZBIN R (AJC22MCA-2044)** in partial fulfilment of the requirements for the award of the Degree of Master of Computer Applications under APJ Abdul Kalam Technological University during the year **2023-24.**

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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

Experiment No.: 01

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

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

Procedure:

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="LOGIN FORM"
      android:textAlignment="center" />
   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="USERNAME" />
   <EditText
      android:id="@+id/editText1"
      android:layout_width="213dp"
      android:layout_height="wrap_content"
```

```
        android:layout_marginTop="8dp"
        android:hint="Enter username" />
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="PASSWORD"
        android:layout_marginTop="16dp"/>
    <EditText
        android:id="@+id/editText2"
        android:layout_width="215dp"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:hint="Enter password" />
    <Button
        android:id="@+id/buttonLogin"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Login" />
</LinearLayout>
```

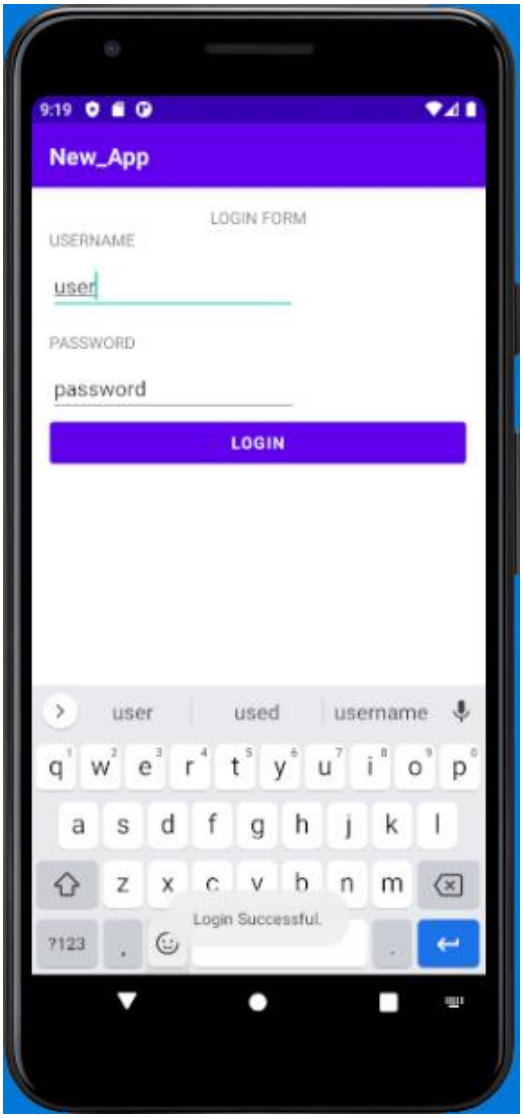
Java code

```
package com.example.new_app;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
```

```
    private static final String VALID_USERNAME="user";
    private static final String VALID_PASSWORD="password";
    private EditText usernameEditText;
    private EditText passwordEditText;
    private Button buttonLogin;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        usernameEditText=findViewById(R.id.usernameEditText);
        passwordEditText=findViewById(R.id.passwordEditText);
        buttonLogin=findViewById(R.id.buttonLogin);
        buttonLogin.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String enteredUsername=usernameEditText.getText().toString();
                String enteredPassword=passwordEditText.getText().toString();
                if (isValidCredentials(enteredUsername,enteredPassword)){
                    showToast("Login Successful.");
                }
                else{
                    showToast("Invalid Credentials!");
                }
            }
        });
    }
    private boolean isValidCredentials(String enteredUsername,String enteredPassword){
        return VALID_USERNAME.equals(enteredUsername) &&
VALID_PASSWORD.equals(enteredPassword);
    }
```

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

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 was obtained.

Experiment No.: 02

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:

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:weightSum="100">
    <TextView
        android:id="@+id/heading"
        android:layout_gravity="center"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:textStyle="bold"
        android:textColor="@color/black"
        android:textAlignment="center"
        android:text="Simple Calculator" />
    <TextView
        android:id="@+id/result"
        android:layout_width="match_parent"
        android:layout_height="80dp"
```

```
    android:text="" />
  <GridLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:columnCount="4"
    android:rowCount="5"
    android:orientation="horizontal"
    android:useDefaultMargins="false"
    android:layout_weight="0">
    <Button
      android:id="@+id/button1"
      android:text="1"
      android:onClick="onDigitClick"/>
    <Button
      android:id="@+id/button2"
      android:text="2"
      android:onClick="onDigitClick"/>
    <Button
      android:id="@+id/button3"
      android:text="3"
      android:onClick="onDigitClick"/>
    <Button
      android:id="@+id/button_a"
      android:text="+"
      android:onClick="onOperatorClick"/>
    <Button
      android:id="@+id/button4"
      android:text="4"
      android:onClick="onDigitClick"/>
```

```
<Button
   android:id="@+id/button5"
   android:text="5"
   android:onClick="onDigitClick"/>
<Button
   android:id="@+id/button6"
   android:text="6"
   android:onClick="onDigitClick"/>
<Button
   android:id="@+id/button_s"
   android:text="-"
   android:onClick="onOperatorClick"/>
<Button
   android:id="@+id/button7"
   android:text="7"
   android:onClick="onDigitClick"/>
<Button
   android:id="@+id/button8"
   android:text="8"
   android:onClick="onDigitClick"/>
<Button
   android:id="@+id/button9"
   android:text="9"
   android:onClick="onDigitClick"/>
<Button
   android:id="@+id/button_m"
   android:text="x"
   android:onClick="onOperatorClick"/>
<Button
   android:id="@+id/button0"
```

```
        android:text="0"
        android:onClick="onDigitClick"/>
    <Button
        android:id="@+id/button_c"
        android:text="AC"
        android:onClick="onClearClick"/>
    <Button
        android:id="@+id/button_d"
        android:text="/"
        android:onClick="onOperatorClick"/>
    <Button
        android:id="@+id/button_eq"
        android:text="="
        android:onClick="onEqualClick"/>
  </GridLayout>
</LinearLayout>
```

Java code

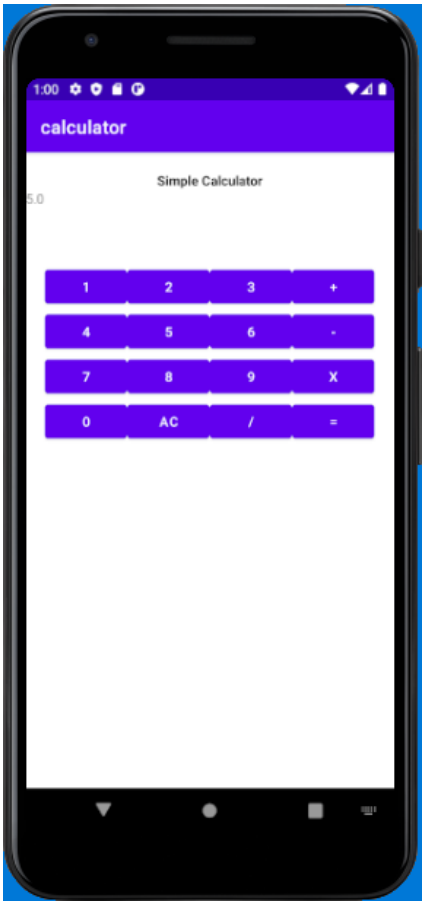
```
package com.example.calculator;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Button;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  private TextView result;
  private Button button1;
  private Button button2;
  private Button button3;
```

```
    private Button button_a;
    private Button button4;
    private Button button5;
    private Button button6;
    private Button button_s;
    private Button button7;
    private Button button8;
    private Button button9;
    private Button button_m;
    private Button button0;
    private Button button_c;
    private Button button_d;
    private Button button_eq;
    private String currentInput = "";
    private double operand1 = 0;
    private double operand2 = 0;
    private String operator = "";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        result=findViewById(R.id.result);
    }
    public void onDigitClick(View view) {
        Button button = (Button) view;
        currentInput += button.getText().toString();
        updateDisplay();
    }
    public void onOperatorClick(View view) {
        if (!currentInput.isEmpty()) {
```

```
        operand1 = Double.parseDouble(currentInput);
        operator = ((Button) view).getText().toString();
        currentInput = "";
    }}
public void onEqualClick(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;
            }
        default:
            return 0;
    }}
public void onClearClick(View view) {
    currentInput = "";
```

```
        operand1 = 0;
        operand2 = 0;
        operator = "";
        updateDisplay();
    }
    private void updateDisplay() {
        result.setText(currentInput);
    }}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 and CO2 was obtained.

Experiment No.: 03

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:

Xml code

```
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   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">
      <TextView
         android:id="@+id/textView"
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:text="Activity Lifecycle"
         android:textSize="24sp"
         android:layout_gravity="center_horizontal"
         android:layout_marginTop="16dp"/>
   <Button
      android:id="@+id/btnCreate"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="onCreate()"/>
   <Button
      android:id="@+id/btnStart"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="onStart()"/>
    <Button
        android:id="@+id/btnPause"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="onPause()"/>
    <Button
        android:id="@+id/btnStop"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="onStop()"/>
    <Button
        android:id="@+id/btnRestart"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="onRestart()"/>
    <Button
        android:id="@+id/btnDestroy"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="onDestroy()"/>
</LinearLayout>
```

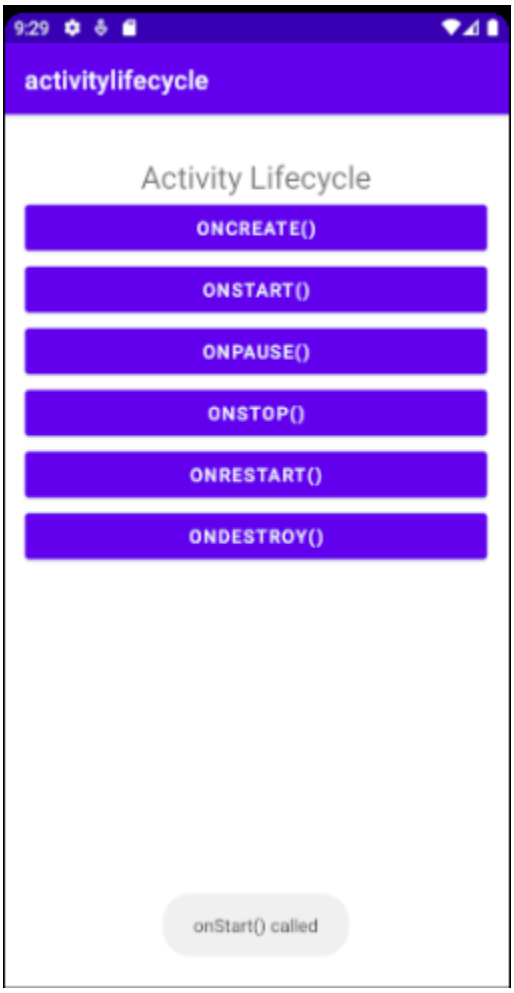
Java code

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

```
import android.widget.Button;
import android.widget.Toast;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
   private TextView textView;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Button btnCreate = findViewById(R.id.btnCreate);
      Button btnStart = findViewById(R.id.btnStart);
      Button btnPause = findViewById(R.id.btnPause);
      Button btnStop = findViewById(R.id.btnStop);
      Button btnRestart = findViewById(R.id.btnRestart);
      Button btnDestroy = findViewById(R.id.btnDestroy);
      btnCreate.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onCreate() called",
Toast.LENGTH_LONG).show();
         }
      });
      btnStart.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onStart() called",
Toast.LENGTH_LONG).show();
         }
      });
      btnPause.setOnClickListener(new View.OnClickListener() {
```

```
        @Override
        public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onPause() called",
Toast.LENGTH_LONG).show();
        }
    });
    btnStop.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onStop() called",
Toast.LENGTH_LONG).show(); }
    });
    btnRestart.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onRestart() called",
Toast.LENGTH_LONG).show();
        }
    });
    btnDestroy.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "onDestroy() called",
Toast.LENGTH_LONG).show();
        }
    });
  }
}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 and CO2 was obtained.

Experiment No.: 04

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:

Xml code

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical" >
   <RelativeLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content" >
      <Button
         android:id="@+id/button1"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="Relative Layout" />
   </RelativeLayout>
   <GridLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:columnCount="2"
      android:rowCount="2" >
      <Button
         android:id="@+id/button2"
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Grid Layout" />
    </GridLayout>
    <FrameLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content" >
      <Button
        android:id="@+id/button3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Frame Layout" />
    </FrameLayout>
    <androidx.constraintlayout.widget.ConstraintLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content">
      <Button
        android:id="@+id/button4"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:text="Constrained Layout" />
    </androidx.constraintlayout.widget.ConstraintLayout>
    <TableLayout
      android:id="@+id/tableLayout1"
      android:layout_width="match_parent"
      android:layout_height="match_parent">
```

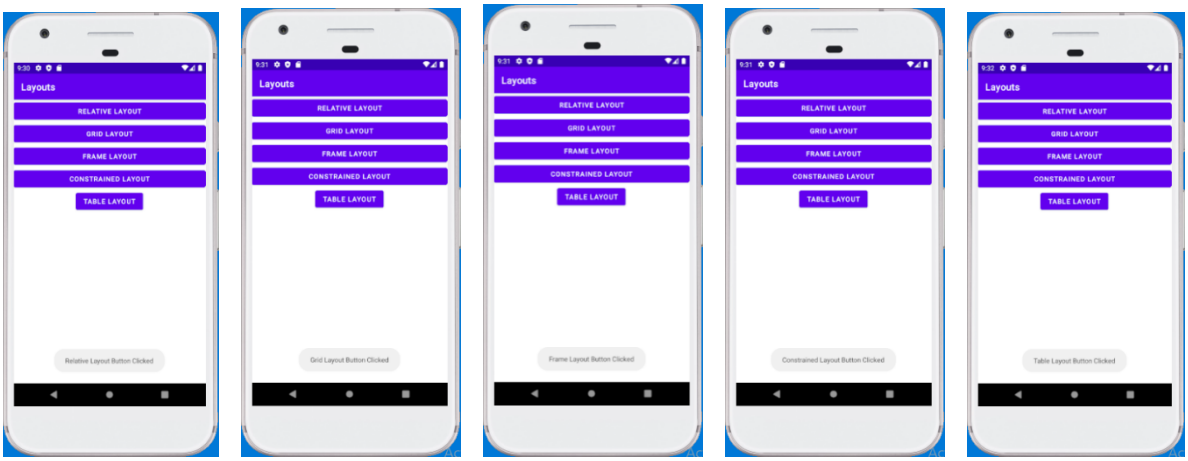
```
    <TableRow
        android:id="@+id/tableRow1"
        android:gravity="center_horizontal">
        <Button
            android:id="@+id/button5"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Table Layout"/>
    </TableRow>
  </TableLayout>
</LinearLayout>
```

Java code

```
package com.example.uilayout;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    Button constraintButton = findViewById(R.id.constraintButton);
    Button linearButton = findViewById(R.id.linearButton);
    Button gridButton = findViewById(R.id.gridButton);
    Button relativeButton = findViewById(R.id.relativeButton);
    Button frameButton = findViewById(R.id.frameButton);
    Button tableButton = findViewById(R.id.tableButton);
```

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

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 was obtained.

Experiment No.: 05

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:

Xml code

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:paddingLeft="16dp"
    android:paddingRight="16dp" >
    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent">
        <LinearLayout
            android:layout_width="fill_parent"
            android:layout_height="fill_parent"
            android:orientation="vertical">
            <ImageView
                android:id="@+id/facebookView"
                android:layout_width="200dp"
                android:layout_height="80dp"
                android:layout_gravity="center"
                android:src="@drawable/facebook" />
            <ImageView
                android:id="@+id/imageView4"
```

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

```
    <ImageView
        android:id="@+id/shareImageView"
        android:layout_width="93dp"
        android:layout_height="86dp"
        android:layout_row="0"
        android:layout_column="3"
        android:layout_gravity="center"
        android:clickable="true"
        android:onClick="onShareClick"
        android:src="@drawable/share" />
</GridLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical">
    <ImageView
        android:id="@+id/imageView7"
        android:layout_width="match_parent"
        android:layout_height="281dp"
        android:src="@drawable/dog" />
    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="40dp"
        android:columnCount="4"
        android:rowCount="4">
        <!-- Like ImageView -->
        <ImageView
            android:id="@+id/likeImageView2"
```

```
            android:layout_width="110dp"
            android:layout_height="83dp"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onLikeClick"
            android:src="@drawable/like" />
        <ImageView
            android:id="@+id/commentImageView2"
            android:layout_width="111dp"
            android:layout_height="66dp"
            android:layout_row="0"
            android:layout_column="1"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onCommentClick"
            android:src="@drawable/comment" />
        <ImageView
            android:id="@+id/shareImageView2"
            android:layout_width="93dp"
            android:layout_height="86dp"
            android:layout_row="0"
            android:layout_column="3"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onShareClick"
            android:src="@drawable/share" />
      </GridLayout>
    </LinearLayout>
  </LinearLayout>
</ScrollView>
```

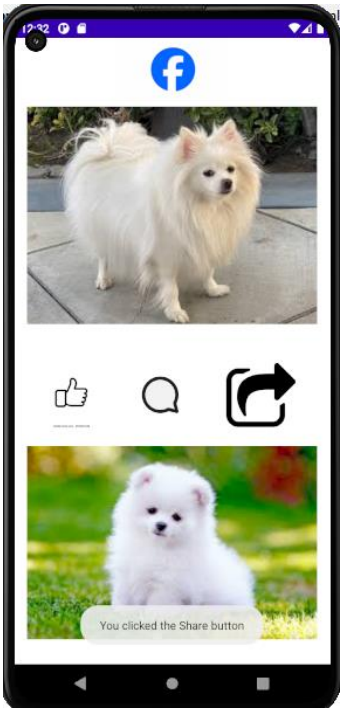
```
</RelativeLayout>
```

Java code

```
package com.example.facebook;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.Toast;
public class MainActivity extends Activity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      // Find the ImageView elements by their IDs
      ImageView facebookView = findViewById(R.id.facebookView );
      ImageView likeImageView = findViewById(R.id.likeImageView);
      ImageView commentImageView = findViewById(R.id.commentImageView);
      ImageView shareImageView = findViewById(R.id.shareImageView);
      // Set click listeners for the ImageViews
      likeImageView.setOnClickListener(new View.OnClickListener() {
         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() {
        public void onClick(View v) {
            showToast("You clicked the Share button");
        }       });    }
  // Helper method to display a toast message
  private void showToast(String message) {
      Toast.makeText(this, message, Toast.LENGTH_SHORT).show();    }}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 was obtained.

Experiment No.: 06

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:

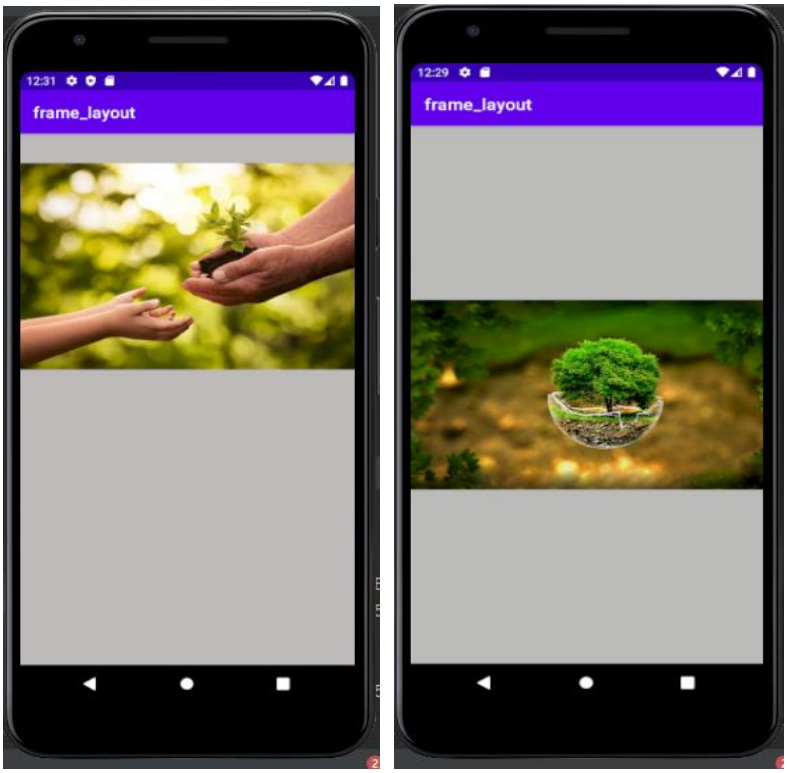
Xml code

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

Java code

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

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO1 was obtained.

Experiment No.: 07

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:

Xml code

```
<?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>
```

Java code

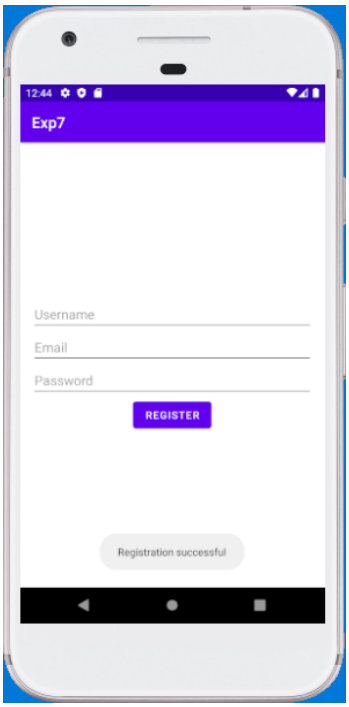
```
package com.example.exp7;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    private EditText usernameEditText, emailEditText, passwordEditText;
    private Button registerButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

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

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

                // Start another activity, e.g., MainActivity, using an Intent
                Intent intent = new Intent(MainActivity.this, MainActivity.class);
                startActivity(intent);
            }
        });
    }
}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO2 was obtained.

Experiment No.: 08

Aim: Develop an application that uses ArrayAdapter with ListView.

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

Procedure:

Xml code

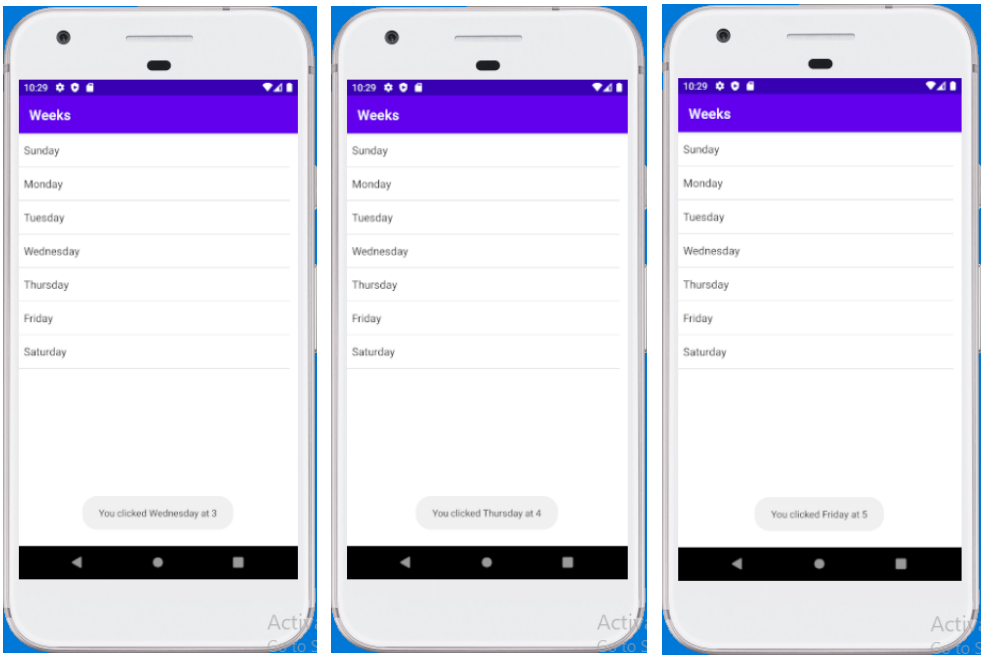
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <ListView
    android:id="@+id/weeks"
    android:layout_width="400dp"
    android:layout_height="354dp"
    tools:ignore="Missing Constraint"/>
</RelativeLayout>
```

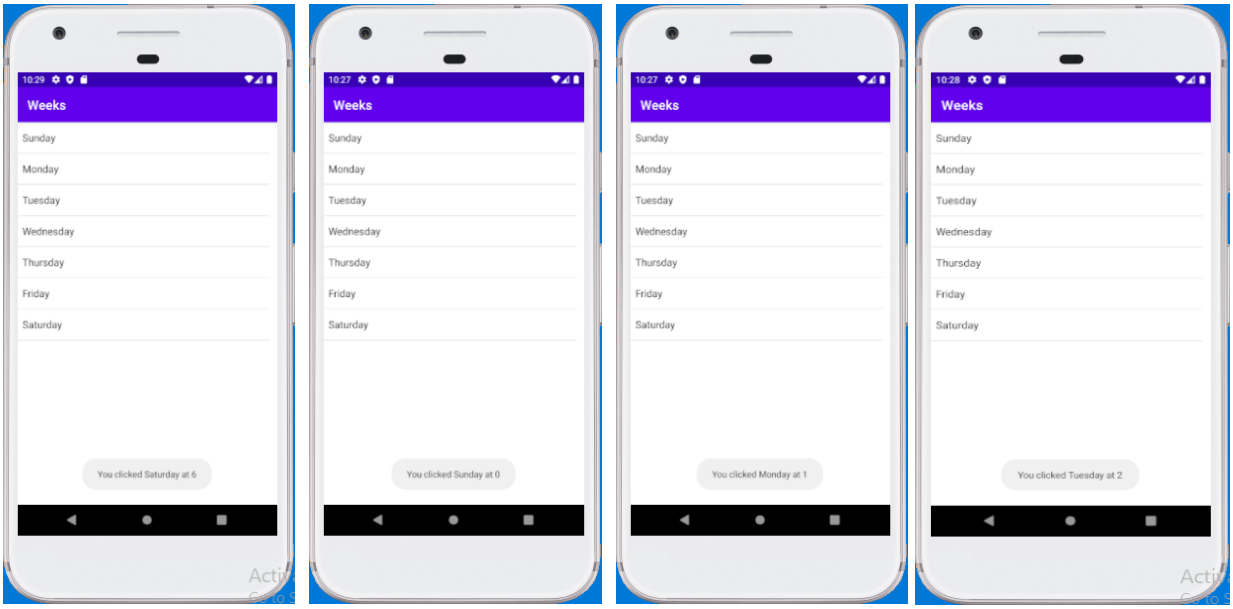
Java code

```
package com.example.weeks;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.view.View;
import android.widget.TextView;
```

```
import android.widget.Toast;
public class MainActivity extends AppCompatActivity implements
AdapterView.OnItemClickListener{
  ListView lists;
  String []
days={"Sunday","Monday","Tuesday","Wednesday","Thursday","Friday","Saturday"};
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     lists=findViewById(R.id.weeks);
     ArrayAdapter<String> adapter=new
ArrayAdapter<String>(this,android.R.layout.simple_spinner_dropdown_item,days);
     lists.setAdapter(adapter);
     lists.setOnItemClickListener(this);
  }
  @Override
  public void onItemClick(AdapterView<?> adapterView, View view, int position, long id) {
     TextView temp=(TextView) view;
     Toast.makeText(this,"You clicked "+temp.getText()+" at "+position,
Toast.LENGTH_LONG).show();
  }
}
```

Output Screenshot





Result:

The program was executed and the result was successfully obtained. Thus CO3 was obtained.

Experiment No.: 09

Aim: Implement Options Menu to navigate to activities.

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

Procedure:

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Home Page"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Mainactivity.java

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

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

```
            break;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

activity_settings_page.xml

```
package com.example.optionsmenu;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
  }
  @Override
  public boolean onCreateOptionsMenu(Menu menu) {
     MenuInflater inflater=getMenuInflater();
     inflater.inflate(R.menu.menu_main,menu);
     return super.onCreateOptionsMenu(menu);
  }
  @Override
```

```
  public boolean onOptionsItemSelected(@NonNull MenuItem item) {
     switch (item.getItemId())
     {
        case R.id.settings:
           Intent intent=new Intent(MainActivity.this,SettingsPage.class);
           startActivity(intent);
           break;
        case R.id.about:
           Toast.makeText(this, "You Clicked About Menu", Toast.LENGTH_LONG).show();
           break;
        case R.id.msgs:
           Toast.makeText(this, "You Clicked Starred Messages Menu", Toast.LENGTH_LONG).show();
           break;
     }
     return super.onOptionsItemSelected(item);
  }
}
```

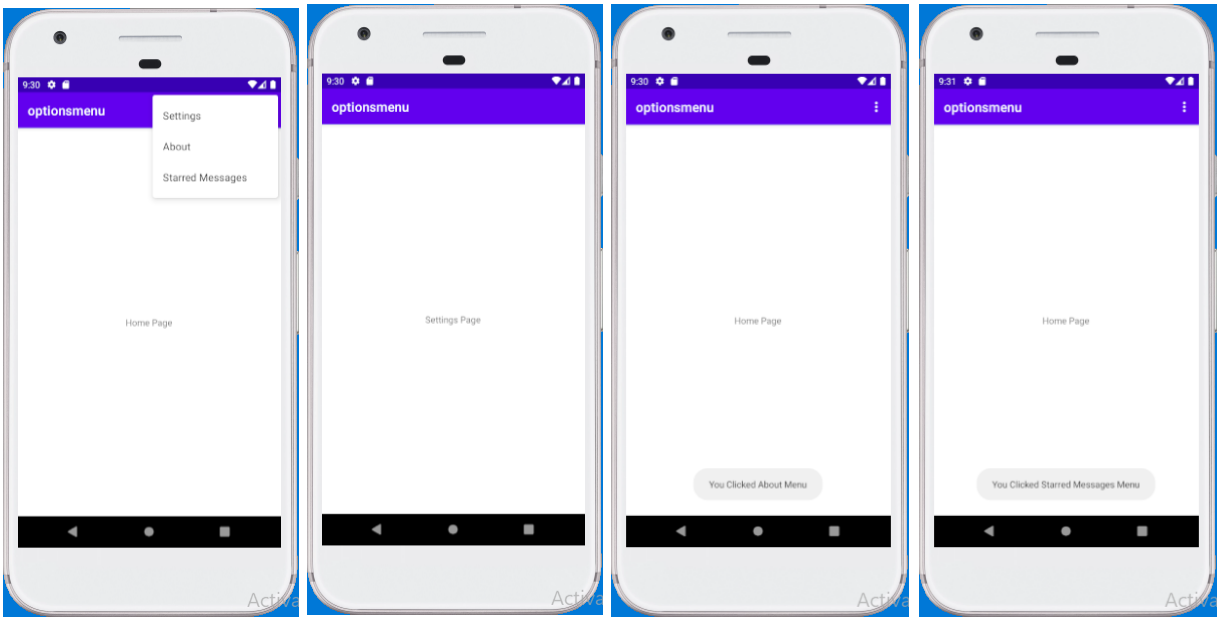
SettingsPage.java

```
package com.example.optionsmenu;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class SettingsPage extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_settings_page);
  }
}
```

menu_main.xml

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

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO3 was obtained.

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:

Xml1

```
<?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">
   <Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginLeft="160dp"
      android:layout_marginTop="160dp"
      android:onClick="switchActivity"
      android:text="Button" />
   <EditText
      android:id="@+id/name"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:ems="10"
      android:hint="Enter your name"
      android:layout_marginLeft="110dp"
      android:layout_marginTop="60dp" />
```

```
    <EditText
        android:id="@+id/age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:layout_marginLeft="110dp"
        android:hint="Enter your age"
        android:layout_marginTop="110dp" />
</RelativeLayout>
```

xml2

```
<?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=".Activity2">
    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

java1

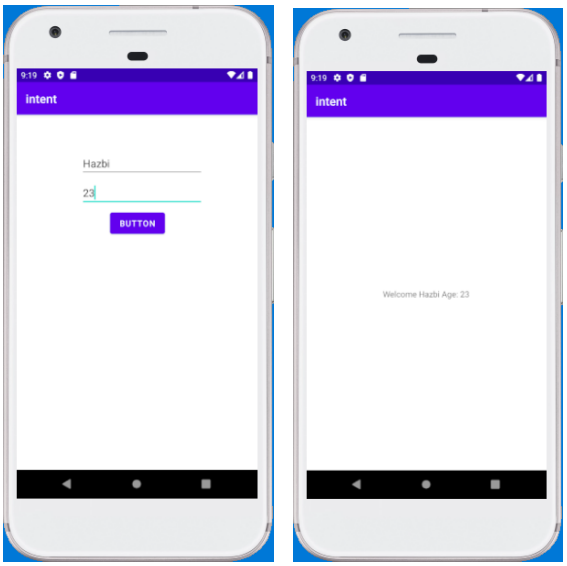
```
package com.example.intent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
    EditText name;
    EditText age;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        name = findViewById(R.id.name);
        age = findViewById(R.id.age);
    }
    public void switchActivity(View view) {
        Intent intent=new Intent(this, Activity2.class);
        intent.putExtra("user",name.getText().toString());
        intent.putExtra("age",age.getText().toString());
        startActivity(intent);
    }
}
```

java2

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

```
import android.widget.TextView;
public class Activity2 extends AppCompatActivity {
    TextView tv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_2);
        Intent intent= getIntent();
        String user = intent.getStringExtra("user");
        String age = intent.getStringExtra("age");
        tv=findViewById(R.id.textView1);
        tv.setText("Welcome "+user+" Age: "+age);
    }
}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO3 was obtained.

Experiment No.: 11

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

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

Procedure:

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/textview1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello World!"
      android:layout_marginTop="50dp"
      android:layout_marginLeft=" 150dp"/>
   <Spinner
      android:id="@+id/spinner2"
      android:layout_height="50dp"
      android:layout_width="200dp"
      android:layout_marginTop="100dp"
      android:layout_marginLeft="110dp"/>
</RelativeLayout>
```

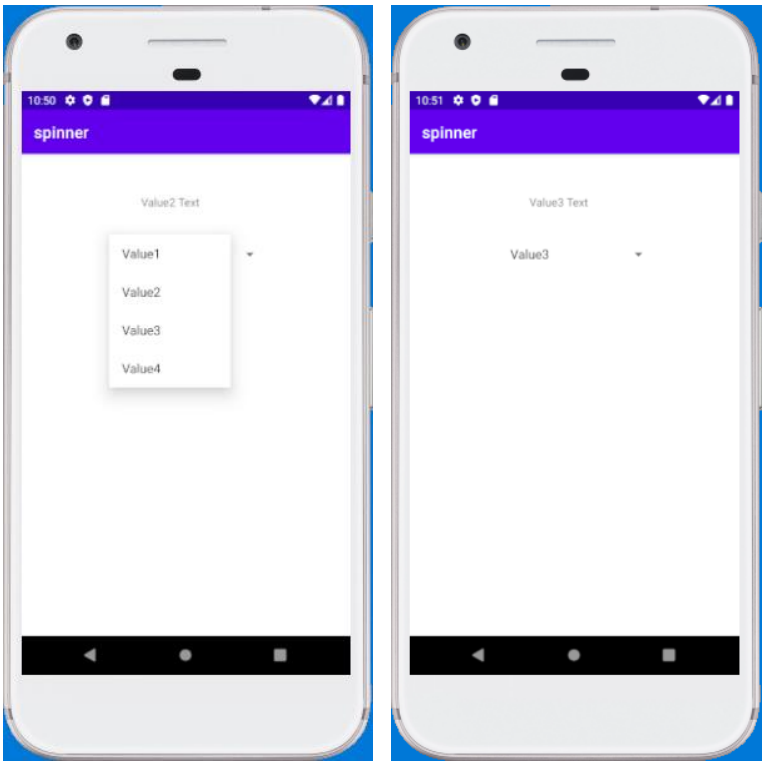
java

```
package com.example.spinner;
```

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
    String[] names={"Value1","Value2","Value3","Value4"};
    String[] text={"Value1 Text","Value2 Text","Value3 Text","Value4 Text"};
    ArrayAdapter<String> adapter;
    Spinner spinner2;
    TextView textview1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        spinner2=findViewById(R.id.spinner2);
        textview1=findViewById(R.id.textview1);
        adapter=new ArrayAdapter<String>(getApplicationContext(),
android.R.layout.simple_list_item_1, names);
        spinner2.setAdapter(adapter);
        spinner2.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
                switch (i){
                    case 0:
                        textview1.setText(""+text[i]);
                        break;
                    case 1:
```

```
            textview1.setText(""+text[i]);
            break;
        case 2:
            textview1.setText(""+text[i]);
            break;
        case 3:
            textview1.setText(""+text[i]);
            break;}}
    @Override
    public void onNothingSelected(AdapterView<?> adapterView) {
    } });}}
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO4 was obtained.

Experiment No.: 12

Aim: Develop applications using fragments.

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

Procedure:

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:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Fragments"
    android:textStyle="bold"
    android:textSize="40dp"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="30dp"/>
  <Button
    android:id="@+id/fragment1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Fragment1"
    android:textSize="20dp"
    android:layout_marginTop="100dp"
    android:layout_centerHorizontal="true"/>
```

```
  <Button
     android:id="@+id/fragment2"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="Fragment2"
     android:textSize="20dp"
     android:layout_marginTop="150dp"
     android:layout_centerHorizontal="true"/>
  <FrameLayout
     android:layout_width="match_parent"
     android:layout_height="match_parent"
     android:id="@+id/layout1">
  </FrameLayout>
</RelativeLayout>
```

java

```
package com.example.fragments;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     Button buttonFragment1=findViewById(R.id.fragment1);
     Button buttonFragment2=findViewById(R.id.fragment2);
     buttonFragment1.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
```

```
            getSupportFragmentManager().beginTransaction()
                    .replace(R.id.layout1,new firstfragment())
                    .commit();
        }
    });
    buttonFragment2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            getSupportFragmentManager().beginTransaction()
                    .replace(R.id.layout1,new secondfragment())
                    .commit();
        }
    });
  }
}
```

fragments

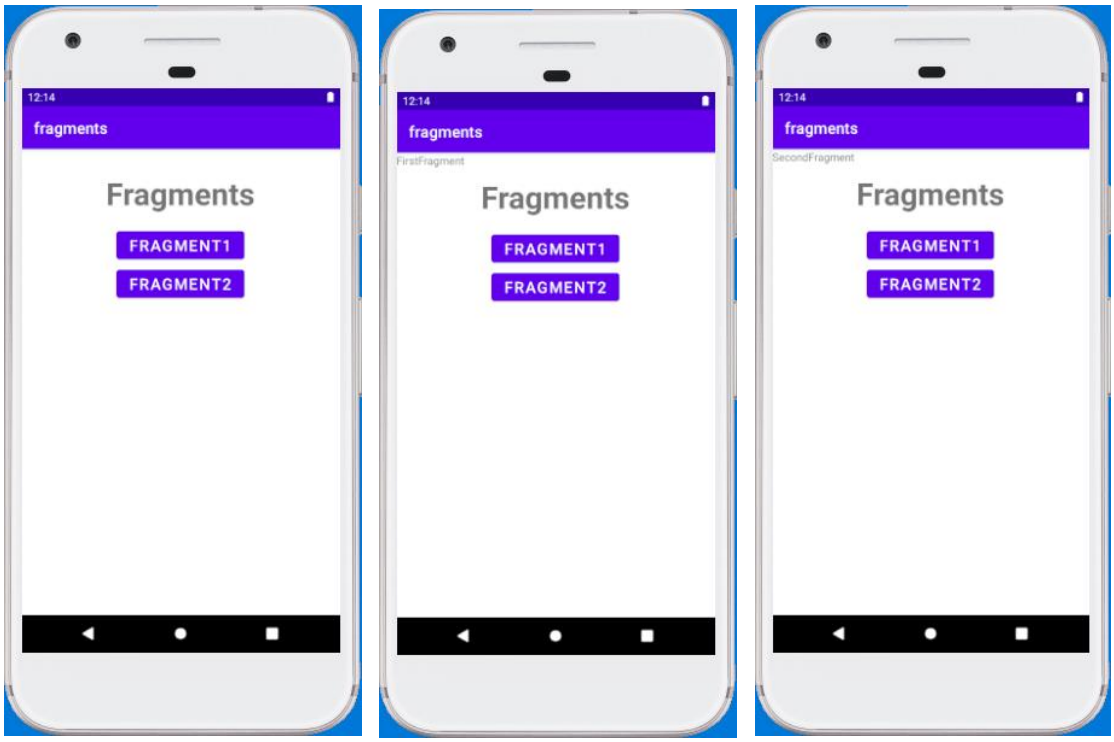
Fragment1

```
@Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container,
                            Bundle savedInstanceState) {
      // Inflate the layout for this fragment
      return inflater.inflate(R.layout.fragment_firstfragment, container, false);
   }
```

Fragment2

```
@Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container,
                            Bundle savedInstanceState) {
      // Inflate the layout for this fragment
      return inflater.inflate(R.layout.fragment_secondfragment, container, false);
   }
```

Output Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO4 was obtained.

Experiment No.: 13

Aim: Implement Adapters and perform exception handling.

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

Procedure:

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/listview"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!" />
</RelativeLayout>
```

java

```
package com.example.exp13;
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("List1");
        list.add("List2");
        list.add("List3");
        list.add("List4");
        try{
            for(int i=0;i<5;i++){
                list.get(i);
            }
        }catch (Exception e){
            Toast.makeText(this, "Exception Caught", Toast.LENGTH_LONG).show();
        }
    }
}
```

Output Screenshot

Result:

The program was executed and the result was successfully obtained. Thus CO4 was obtained.

Experiment No.: 14

Aim: Create database using SQLite and perform INSERT and SELECT

CO5: Develop mobile applications using SQLite.

Procedure:

XML code

```
<?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/tv1"
     android:layout_centerHorizontal="true"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:textColor="@color/black"
     android:text="Student Details"
     android:textSize="15sp" />
  <EditText
     android:id="@+id/et1"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:hint="Enter rollno"
     android:layout_centerHorizontal="true"
     android:layout_margin="18dp"
     android:layout_below="@+id/tv1"/>
```

```
<EditText
    android:id="@+id/et2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Enter name"
    android:layout_centerHorizontal="true"
    android:layout_margin="18dp"
    android:layout_below="@+id/et1"/>
<EditText
    android:id="@+id/et3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/et2"
    android:layout_centerHorizontal="true"
    android:layout_marginStart="18dp"
    android:layout_marginTop="22dp"
    android:layout_marginEnd="18dp"
    android:layout_marginBottom="18dp"
    android:hint="Enter department" />
<Button
    android:id="@+id/bt1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Insert"
    android:onClick="onInsert"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
    android:layout_below="@+id/et3"/>
```

```
<Button
    android:id="@+id/bt3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Read"
    android:onClick="onRead"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
    android:layout_below="@+id/bt2"/>
</RelativeLayout>
```

JAVA code

```
package com.example.sqlite;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.Cursor;
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 tv1;
  EditText et1,et2,et3;
  Button bt1,bt2;
  String rno;
```

```
String name;
String dept;
SQLiteDatabase db;
@Override
protected void onCreate(Bundle savedInstanceState) {
   super.onCreate(savedInstanceState);
   setContentView(R.layout.activity_main);
   tv1 = findViewById(R.id.tv1);
   et1 = findViewById(R.id.et1);
   et2 = findViewById(R.id.et2);
   et3 = findViewById(R.id.et3);
   bt1 = findViewById(R.id.bt1);
   bt2 = findViewById(R.id.bt2);
   DbHelper dbHelper = new DbHelper(this);
   db = dbHelper.getWritableDatabase();
   db = dbHelper.getReadableDatabase();
}
public void onInsert(View view) {
   rno = et1.getText().toString();
   name = et2.getText().toString();
   dept = et3.getText().toString();
   if (rno.equals("") || name.equals("") || dept.equals("")) {
      Toast.makeText(this,"please enter values",Toast.LENGTH_LONG).show();
   }
   else {
      ContentValues values = new ContentValues();
      values.put("rollno",rno);
      values.put("name",name);
```

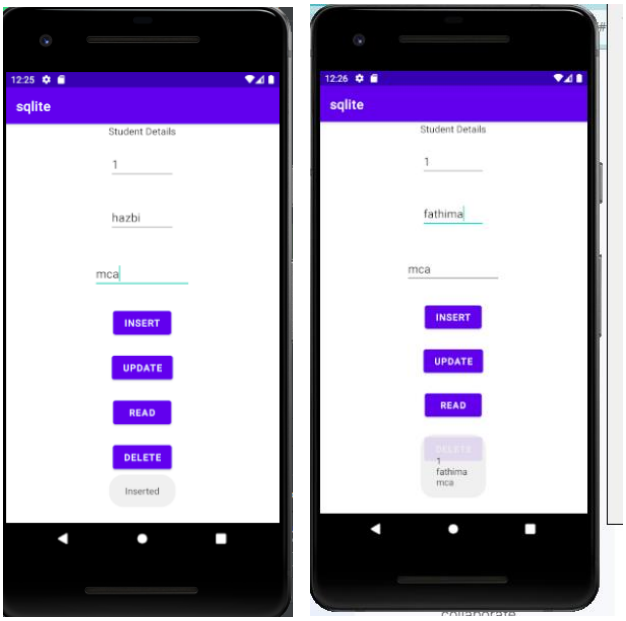
```
        values.put("dept",dept);
        db.insert("student",null,values);
        Toast.makeText(this,"Inserted",Toast.LENGTH_LONG).show();
    }
  }
  public void onRead(View view) {
    StringBuffer buffer = new StringBuffer();
    Cursor c=db.rawQuery("select * from student",null);
    while (c.moveToNext())
    {
      buffer.append("\n"+c.getString(0));
      buffer.append("\n"+c.getString(1));
      buffer.append("\n"+c.getString(2));
    }
    Toast.makeText(this,buffer.toString(), Toast.LENGTH_SHORT).show();
  }
```

DBHelper code

```
package com.example.sqlite;
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 Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO5 was obtained.

Experiment No.: 15

Aim: Perform UPDATE and DELETE on SQLite database.

CO5: Develop mobile applications using SQLite.

Procedure:

XML code

```
<?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/tv1"
    android:layout_centerHorizontal="true"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textColor="@color/black"
    android:text="Student Details"
    android:textSize="15sp" />
  <EditText
    android:id="@+id/et1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Enter rollno"
    android:layout_centerHorizontal="true"
    android:layout_margin="18dp"
```

```
    android:layout_below="@+id/tv1"/>
  <EditText
    android:id="@+id/et2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Enter name"
    android:layout_centerHorizontal="true"
    android:layout_margin="18dp"
    android:layout_below="@+id/et1"/>
  <EditText
    android:id="@+id/et3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/et2"
    android:layout_centerHorizontal="true"
    android:layout_marginStart="18dp"
    android:layout_marginTop="22dp"
    android:layout_marginEnd="18dp"
    android:layout_marginBottom="18dp"
    android:hint="Enter department" />
  <Button
    android:id="@+id/bt1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Insert"
    android:onClick="onInsert"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
```

```
    android:layout_below="@+id/et3"/>
  <Button
    android:id="@+id/bt2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Update"
    android:onClick="onUpdate"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
    android:layout_below="@+id/bt1"/>
  <Button
    android:id="@+id/bt3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Read"
    android:onClick="onRead"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
    android:layout_below="@+id/bt2"/>
  <Button
    android:id="@+id/bt4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Delete"
    android:onClick="onDelete"
    android:layout_centerHorizontal="true"
    android:layout_margin="10dp"
    android:layout_below="@+id/bt3"/>
```

```
</RelativeLayout>
```

JAVA code

```
package com.example.sqlite;
import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.Cursor;
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 tv1;
  EditText et1,et2,et3;
  Button bt1,bt2,bt3,bt4;
  String rno;
  String name;
  String dept;
  SQLiteDatabase db;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     tv1 = findViewById(R.id.tv1);
     et1 = findViewById(R.id.et1);
```

```
    et2 = findViewById(R.id.et2);
    et3 = findViewById(R.id.et3);
    bt1 = findViewById(R.id.bt1);
    bt2 = findViewById(R.id.bt2);
    bt3 = findViewById(R.id.bt3);
    bt4 = findViewById(R.id.bt4);
    DbHelper dbHelper = new DbHelper(this);
    db = dbHelper.getWritableDatabase();
    db = dbHelper.getReadableDatabase();
  }
  public void onInsert(View view) {
    rno = et1.getText().toString();
    name = et2.getText().toString();
    dept = et3.getText().toString();
    if (rno.equals("") || name.equals("") || dept.equals("")) {
      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);
      db.insert("student",null,values);
      Toast.makeText(this,"Inserted",Toast.LENGTH_LONG).show();
    }
  }
  public void onUpdate(View view) {
    rno = et1.getText().toString();
```

```
    name = et2.getText().toString();
    dept = et3.getText().toString();
    if (rno.equals("") || name.equals("") || dept.equals("")) {
       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);
       db.update("student",values,"rollno="+rno,null);
       Toast.makeText(this,"Updated",Toast.LENGTH_LONG).show();
    }
  }
  public void onRead(View view) {
    StringBuffer buffer = new StringBuffer();
    Cursor c=db.rawQuery("select * from student",null);
    while (c.moveToNext())
    {
       buffer.append("\n"+c.getString(0));
       buffer.append("\n"+c.getString(1));
       buffer.append("\n"+c.getString(2));
    }
    Toast.makeText(this,buffer.toString(), Toast.LENGTH_SHORT).show();
  }
  public void onDelete(View view) {
    rno = et1.getText().toString();
    name = et2.getText().toString();
```

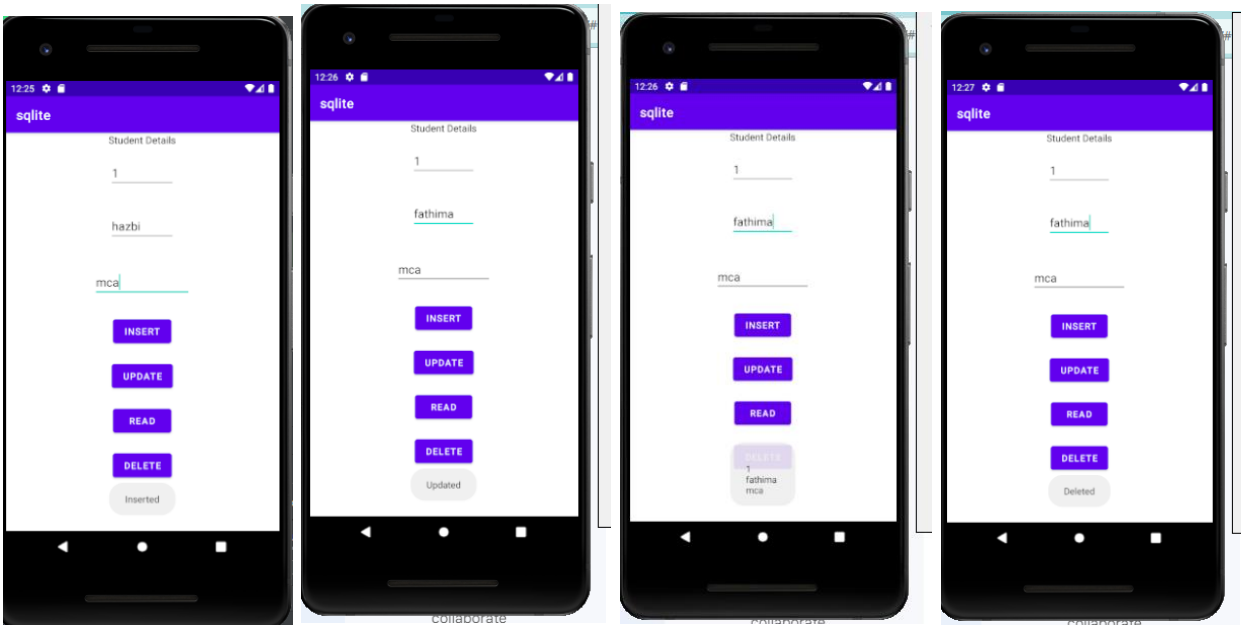
```
    dept = et3.getText().toString();
    if (rno.equals(""))
    {
      Toast.makeText(this, "Pls enter value", Toast.LENGTH_LONG).show();
    }
    else
    {
      db.delete("student","rollno="+rno,null);
      Toast.makeText(this, "Deleted", Toast.LENGTH_LONG).show();
    }
  }
}
```

DBHelper code

```
package com.example.sqlite;
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 Screenshot



Result:

The program was executed and the result was successfully obtained. Thus CO5 was obtained.