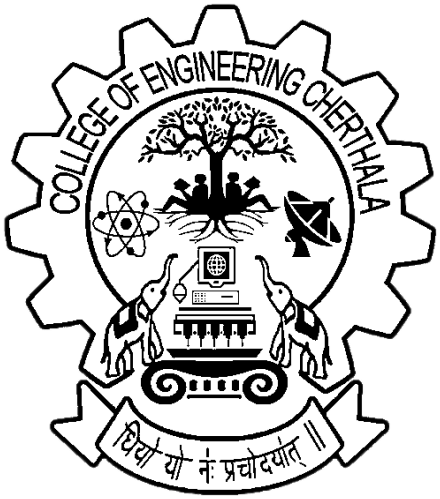
COLLEGE OF ENGINEERING CHERTHALA

LAB RECORD

20MCA243 –MOBILE APPLICATION DEVELOPMENT LAB



CERTIFICATE

This is certified to be bonafide works of Mr./Ms. ……., In the class ……...., Reg. No. ……., of College of Engineering Cherthala, during the academic year 2023-24.

Teacher In Charge **External Examiner**

Internal Examiner

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Experiment No. 1

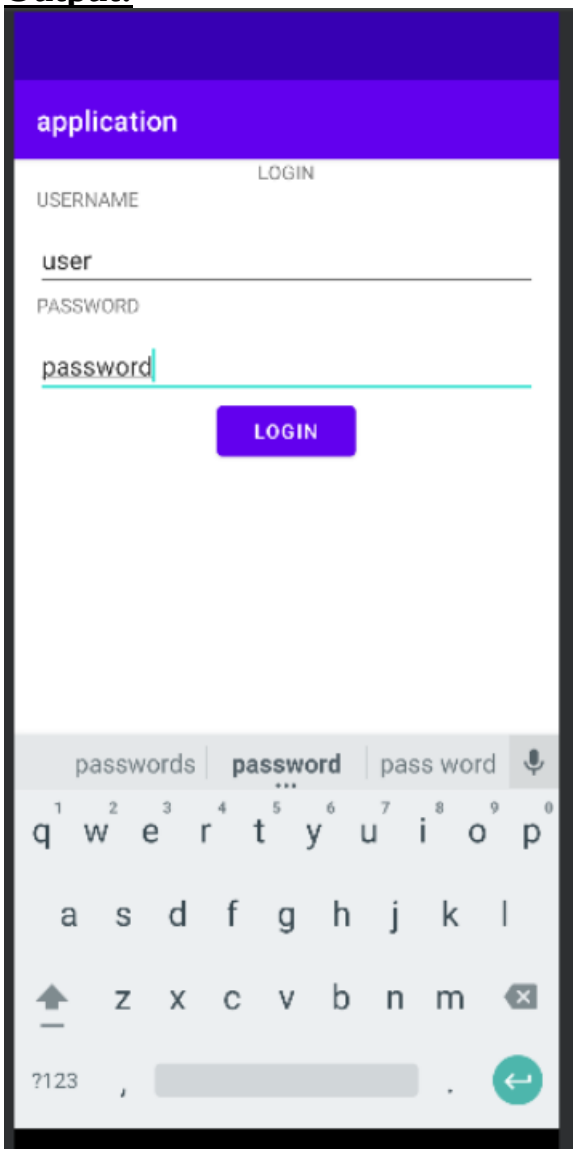
Aim: Design a Login Form with username and password using Linear Layout and toast valid Credentials.

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="LOGIN FORM"
      android:textAlignment="center" />
   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="USERNAME" />
   <EditText
      android:id="@+id/usernameEditText"
      android:layout_width="213dp"
      android:layout_height="wrap_content"
      android:layout_marginTop="8dp"
      android:hint="Enter username" />
   <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="PASSWORD"
      android:layout_marginTop="16dp"/>
   <EditText
      android:id="@+id/passwordEditText"
      android:layout_width="215dp"
      android:layout_height="wrap_content"
      android:layout_marginTop="8dp"
      android:hint="Enter password" />
   <Button
      android:id="@+id/loginButton"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
```

Output:


application
LOGIN
USERNAME
user
PASSWORD
password
LOGIN
passwords
password
pass word

```
android:text="Login" />
</LinearLayout>
```

Main.activity.java

```
package com.example.my_apk;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
   private static final String VALID_USERNAME="user";
   private static final String VALID_PASSWORD="password";
   private EditText usernameEditText;
   private EditText passwordEditText;
   private Button loginButton;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      usernameEditText=findViewById(R.id.usernameEditText);
      passwordEditText=findViewById(R.id.passwordEditText);
      loginButton=findViewById(R.id.loginButton);
      loginButton.setOnClickListener(v -> {
         String enteredUsername=usernameEditText.getText().toString();
         String enteredPassword=passwordEditText.getText().toString();
         if(isValidCredentials(enteredUsername,enteredPassword)) {
            showToast("Login Successful");
         }
         else{
            showToast("Invalid Credentials");
         }
      });}
   private boolean isValidCredentials(String enteredUsername, String enteredPassword){
      return VALID_USERNAME.equals(enteredUsername) &&
VALID_PASSWORD.equals(enteredPassword);
   }
   private void showToast(String message){
      Toast.makeText(this,message,Toast.LENGTH_SHORT).show();
   }}
```

Result : The program was executed successfully and the output was obtained.

Output


10:44
My Application
Activity Lifecycle
ONCREATE()
ONSTART()
ONPAUSE()
ONSTOP()
ONRESTART()
ONDESTROY()

Experiment No. 2

Aim: Write a program that demonstrates Activity Lifecycle.

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="LOGIN FORM"
      android:textAlignment="center" />
   <TextView
      android:id="@+id/textView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="USERNAME" />
   <EditText
      android:id="@+id/usernameEditText"
      android:layout_width="213dp"
      android:layout_height="wrap_content"
      android:layout_marginTop="8dp"
      android:hint="Enter username" />
   <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="PASSWORD"
      android:layout_marginTop="16dp"/>
   <EditText
      android:id="@+id/passwordEditText"
      android:layout_width="215dp"
      android:layout_height="wrap_content"
      android:layout_marginTop="8dp"
      android:hint="Enter password" />
   <Button
      android:id="@+id/loginButton"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
```

```
        android:text="Login" />
</LinearLayout>
```

Main.activity.java

```
package com.example.my_apk;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    private static final String VALID_USERNAME="user";
    private static final String VALID_PASSWORD="password";
    private EditText usernameEditText;
    private EditText passwordEditText;
    private Button loginButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        usernameEditText=findViewById(R.id.usernameEditText);
        passwordEditText=findViewById(R.id.passwordEditText);
        loginButton=findViewById(R.id.loginButton);
        loginButton.setOnClickListener(v -> {
            String enteredUsername=usernameEditText.getText().toString();
            String enteredPassword=passwordEditText.getText().toString();
            if(isValidCredentials(enteredUsername,enteredPassword)) {
                showToast("Login Successful");
            }
            else{
                showToast("Invalid Credentials");
            }
        });}
    private boolean isValidCredentials(String enteredUsername, String enteredPassword){
        return VALID_USERNAME.equals(enteredUsername) &&
VALID_PASSWORD.equals(enteredPassword);
    }
    private void showToast(String message){
        Toast.makeText(this,message,Toast.LENGTH_SHORT).show();
    }}
```

Result : The program was executed successfully and the output was obtained.

Experiment No. 3

Aim: Implementing basic arithmetic operations of a simple calculator

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="30dp"
   android:gravity="center_horizontal">
   <!-- Text View -->
   <TextView
      android:id="@+id/TextView1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Simple Calculator"
      android:textColor="@color/black"
      android:textSize="24sp"
      android:layout_gravity="center"
      android:layout_marginBottom="16dp"
      android:textStyle="bold"/>
   <!-- Edit Text-->
   <EditText
      android:id="@+id/EditText1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="30dp"
      android:layout_marginStart="50dp"
      android:layout_marginTop="50dp"
      android:layout_marginEnd="50dp"
      android:layout_marginBottom="50dp" />
   <GridLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:rowCount="4"
      android:columnCount="4"
      android:layout_gravity="center"
      android:layout_marginTop="40dp">
      <Button
```

```
    android:id="@+id/button1"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="1"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button2"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="2"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button3"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="3"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/buttonDiv"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="/"
    android:textSize="18sp"
    android:onClick="onOperatorClick"/>
<Button
    android:id="@+id/button4"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="4"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
<Button
    android:id="@+id/button5"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
```

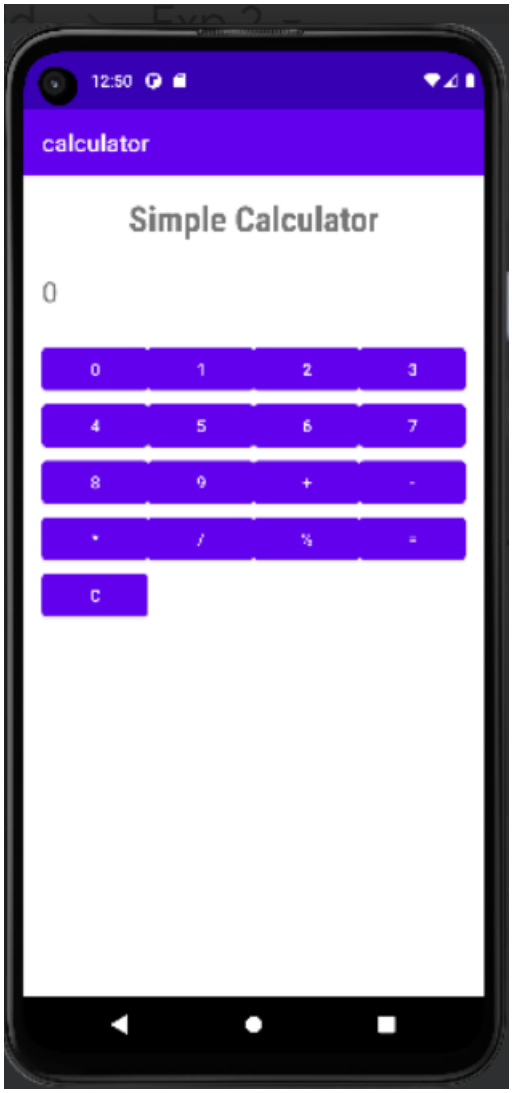
```
    android:text="5"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
  <Button
    android:id="@+id/button6"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="6"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
  <Button
    android:id="@+id/buttonMul"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="*"
    android:textSize="18sp"
    android:onClick="onOperatorClick"/>
  <Button
    android:id="@+id/button7"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="7"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
  <Button
    android:id="@+id/button8"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="8"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
  <Button
    android:id="@+id/button9"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    style="?android:attr/buttonStyleSmall"
    android:layout_columnWeight="1"
    android:text="9"
    android:textSize="18sp"
    android:onClick="onDigitClick"/>
  <Button
    android:id="@+id/buttonSub"
```

```
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            style="?android:attr/buttonStyleSmall"
            android:layout_columnWeight="1"
            android:text="-"
            android:textSize="18sp"
            android:onClick="onOperatorClick"/>
        <Button
            android:id="@+id/button0"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            style="?android:attr/buttonStyleSmall"
            android:layout_columnWeight="1"
            android:text="0"
            android:textSize="18sp"
            android:onClick="onDigitClick"/>
        <Button
            android:id="@+id/buttonDot"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            style="?android:attr/buttonStyleSmall"
            android:layout_columnWeight="1"
            android:text="C"
            android:textSize="18sp"
            android:onClick="onClearClick"/>
        <Button
            android:id="@+id/buttonEqual"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            style="?android:attr/buttonStyleSmall"
            android:layout_columnWeight="1"
            android:text="="
            android:textSize="18sp"
            android:onClick="onEqualsClick"/>
        <Button
            android:id="@+id/buttonAdd"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            style="?android:attr/buttonStyleSmall"
            android:layout_columnWeight="1"
            android:text="+"
            android:textSize="18sp"
            android:onClick="onOperatorClick"/>
    </GridLayout>
</LinearLayout>
```

Main.activity.java

```
package com.example.calc;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
    private TextView TextView1;
    private Button button1;
    private Button button2;
    private Button button3;
    private Button buttonDiv;
    private Button button4;
    private Button button5;
    private Button button6;
    private Button buttonMul;
    private Button button7;
    private Button button8;
    private Button button9;
    private Button buttonSub;
    private Button button0;
    private Button buttonDot;
    private Button buttonEqual;
    private Button buttonAdd;
    private String currentInput = "";
    private double operand1 = 0;
    private String operator = "";
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        TextView1 =  findViewById(R.id.TextView1);
    }
    public void onDigitClick(View view) {
        Button button = (Button) view;
        currentInput += button.getText().toString();
        updateDisplay();
    }
    public void onOperatorClick(View view){
        if (!currentInput.isEmpty()){
            operand1 = Double.parseDouble(currentInput);
            operator = ((Button) view).getText().toString();
            currentInput = "";
        }    }
    public void onEqualsClick(View view){
        if (!currentInput.isEmpty()){
            double operand2 = Double.parseDouble(currentInput);
            double result = performOperation(operand1,operand2,operator);
            currentInput = String.valueOf((result));
```

Output



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

Result : The program was executed successfully and the output was obtained.

Output


9:25
My Application
CONSTRAINTLAYOUT
LINEARLAYOUT
GRIDLAYOUT
RELATIVELAYOUT
FRAMELAYOUT
TABLELAYOUT

Experiment No. 4

Aim: Implement validations on various UI controls.

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">
    <Button
        android:id="@+id/constraintButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="ConstraintLayout" />
    <Button
        android:id="@+id/linearButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="LinearLayout" />
    <Button
        android:id="@+id/gridButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="GridLayout" />
    <Button
        android:id="@+id/relativeButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="RelativeLayout" />
    <Button
        android:id="@+id/frameButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="FrameLayout" />
    <Button
        android:id="@+id/tableButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```
        android:text="TableLayout" />
</LinearLayout>
```

MainActivity.java

```
package com.example.ui;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button constraintButton = findViewById(R.id.constraintButton);
        Button linearButton = findViewById(R.id.linearButton);
        Button gridButton = findViewById(R.id.gridButton);
        Button relativeButton = findViewById(R.id.relativeButton);
        Button frameButton = findViewById(R.id.frameButton);
        Button tableButton = findViewById(R.id.tableButton);
        View.OnClickListener buttonClickListener = new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String layoutName = ((Button) v).getText().toString();
                displayToken(layoutName);
            }       };

        constraintButton.setOnClickListener(buttonClickListener);
        linearButton.setOnClickListener(buttonClickListener);
        gridButton.setOnClickListener(buttonClickListener);
        relativeButton.setOnClickListener(buttonClickListener);
        frameButton.setOnClickListener(buttonClickListener);
        tableButton.setOnClickListener(buttonClickListener);
    }

    private void displayToken(String layoutName) {
        Toast.makeText(this, "Token from " + layoutName, Toast.LENGTH_SHORT).show();
    }
}
```

Result : The program was executed successfully and the output was obtained.

Experiment No. 5

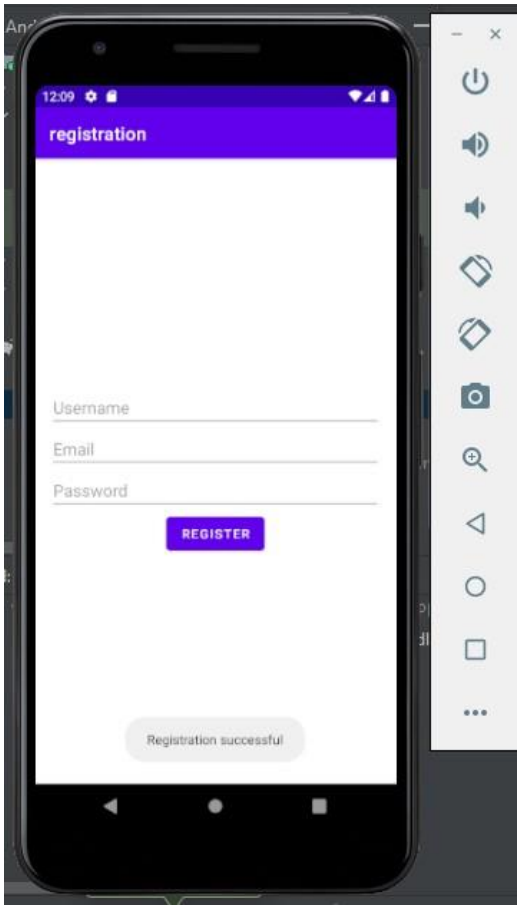
Aim: Design a registration activity and store registration details in local memory of phone using Intents and Shared Preferences.

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:padding="16dp"
   android:gravity="center">
   <EditText
      android:id="@+id/usernameEditText"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Username"
      android:inputType="text" />
   <EditText
      android:id="@+id/emailEditText"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Email"
      android:inputType="textEmailAddress" />
   <EditText
      android:id="@+id/passwordEditText"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Password"
      android:inputType="textPassword" />
   <Button
      android:id="@+id/registerButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      android:text="Register" />
</LinearLayout>
```

Output


12:09
registration
Username
Email
Password
REGISTER
Registration successful

MainActivity.java

```
package com.example.registration;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
   private EditText usernameEditText, emailEditText, passwordEditText;
   private Button registerButton;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      usernameEditText = findViewById(R.id.usernameEditText);
      emailEditText = findViewById(R.id.emailEditText);
      passwordEditText = findViewById(R.id.passwordEditText);
      registerButton = findViewById(R.id.registerButton);
      registerButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            String username = usernameEditText.getText().toString();
            String email = emailEditText.getText().toString();
            String password = passwordEditText.getText().toString();
            // Store registration details in SharedPreferences
            SharedPreferences preferences = getSharedPreferences("MyPrefs",
MODE_PRIVATE);
            SharedPreferences.Editor editor = preferences.edit();
            editor.putString("username", username);
            editor.putString("email", email);
            editor.putString("password", password);
            editor.apply();
            Toast.makeText(MainActivity.this, "Registration successful",
Toast.LENGTH_SHORT).show();
            // Start another activity, e.g., MainActivity, using an Intent
            Intent intent = new Intent(MainActivity.this, MainActivity.class);
            startActivity(intent);
         }       });
   }}
```

Result : The program was executed successfully and the output was obtained.

Experiment No. 6

Aim: Create a Counter that increments and decrements .

Procedure:

Activity_main.xml

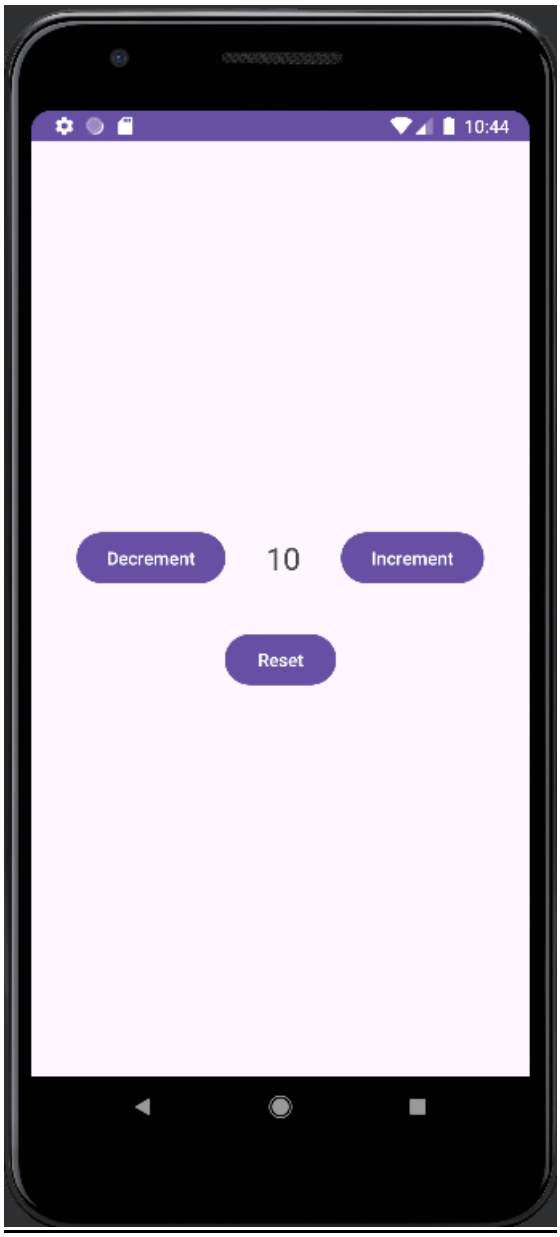
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   android:gravity="center"
   tools:context=".MainActivity">
<TextView
      android:id="@+id/counterTextView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="0"
      android:textSize="48sp"/>

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Increment"
      android:id="@+id/incrementButton"/>

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Decrement"
      android:id="@+id/decrementButton"/>

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Reset"
      android:id="@+id/resetButton"/>
</LinearLayout>
```

Output



MainActivity.java

```
package com.example.counter;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    private TextView counterTextView;
    private int counter = 0;

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

        counterTextView = findViewById(R.id.counterTextView);
        Button incrementButton = findViewById(R.id.incrementButton);
        Button decrementButton = findViewById(R.id.decrementButton);
        Button resetButton = findViewById(R.id.resetButton);

        updateCounterTextView();

        incrementButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                counter++;
                updateCounterTextView();
}
        });

        decrementButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                counter--;
                updateCounterTextView();
            }
        });

        resetButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```
            counter = 0;
              updateCounterTextView();
            }
        });
    }

    private void updateCounterTextView() {
        counterTextView.setText(String.valueOf(counter));
    }
}
```

Result : The program was executed successfully and the output was obtained.

Experiment No. 7

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

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:paddingLeft="16dp"
   android:paddingRight="16dp" >
   <ScrollView
      android:layout_width="match_parent"
      android:layout_height="match_parent">
      <LinearLayout
         android:layout_width="fill_parent"
         android:layout_height="fill_parent"
         android:orientation="vertical">
         <ImageView
            android:id="@+id/facebookView"
            android:layout_width="200dp"
            android:layout_height="80dp"
            android:layout_gravity="center"
            android:src="@drawable/facebook" />
         <ImageView
            android:id="@+id/imageView4"
            android:layout_width="match_parent"
            android:layout_height="281dp"
            android:src="@drawable/post" />
         <GridLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:layout_marginTop="40dp"
            android:columnCount="4"
            android:rowCount="4">
            <!-- Like ImageView -->
            <ImageView
               android:id="@+id/likeImageView"
               android:layout_width="110dp"
               android:layout_height="83dp"
               android:layout_gravity="center"
               android:clickable="true"
```

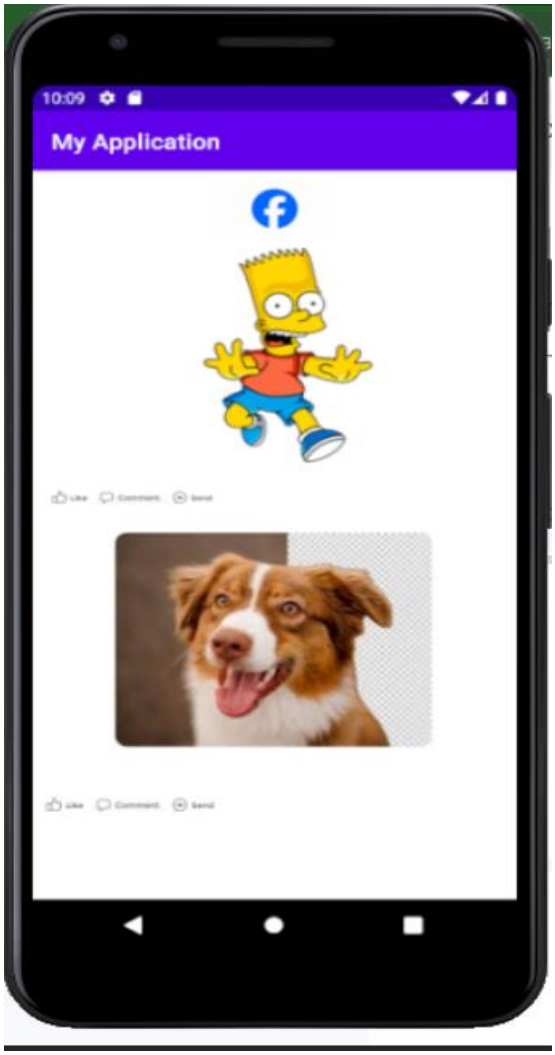
```
            android:onClick="onLikeClick"
            android:src="@drawable/like" />
        <!-- Comment ImageView -->
        <ImageView
            android:id="@+id/commentImageView"
            android:layout_width="111dp"
            android:layout_height="66dp"
            android:layout_row="0"
            android:layout_column="1"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onCommentClick"
            android:src="@drawable/comment" />
        <ImageView
            android:id="@+id/shareImageView"
            android:layout_width="93dp"
            android:layout_height="86dp"
            android:layout_row="0"
            android:layout_column="3"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onShareClick"
            android:src="@drawable/share" />
    </GridLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">
        <ImageView
            android:id="@+id/imageView7"
            android:layout_width="match_parent"
            android:layout_height="281dp"
            android:src="@drawable/dog" />
        <GridLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:layout_marginTop="40dp"
            android:columnCount="4"
            android:rowCount="4">
            <!-- Like ImageView -->
            <ImageView
                android:id="@+id/likeImageView2"
                android:layout_width="110dp"
                android:layout_height="83dp"
                android:layout_gravity="center"
                android:clickable="true"
                android:onClick="onLikeClick"
                android:src="@drawable/like" />
            <!-- (Your existing ImageView code) -->
```

```
            <!-- Comment ImageView -->
            <ImageView
               android:id="@+id/commentImageView2"
               android:layout_width="111dp"
               android:layout_height="66dp"
               android:layout_row="0"
               android:layout_column="1"
               android:layout_gravity="center"
               android:clickable="true"
               android:onClick="onCommentClick"
               android:src="@drawable/comment" />
            <ImageView
               android:id="@+id/shareImageView2"
               android:layout_width="93dp"
               android:layout_height="86dp"
               android:layout_row="0"
               android:layout_column="3"
               android:layout_gravity="center"
               android:clickable="true"
               android:onClick="onShareClick"
               android:src="@drawable/share" />
            <!-- (Your existing ImageView code) -->
         </GridLayout>
      </LinearLayout>
   </LinearLayout>
  </ScrollView>
</RelativeLayout>
```

MainActivity.java

```
package com.example.facebook;
import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.Toast;
public class MainActivity extends Activity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      // Find the ImageView elements by their IDs
      ImageView facebookView = findViewById(R.id.facebookView );
      ImageView likeImageView = findViewById(R.id.likeImageView);
      ImageView commentImageView = findViewById(R.id.commentImageView);
      ImageView shareImageView = findViewById(R.id.shareImageView);
      // Set click listeners for the ImageViews
      likeImageView.setOnClickListener(new View.OnClickListener() {
         public void onClick(View v) {
```

Output



```
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();    }}
```

Result : The program was executed successfully and the output was obtained.

Output

Experiment No. 8

Aim: Develop an application that toggles image using FrameLayout.

Procedure:

Activity_main.xml

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

MainActivity.java

```
javapackage com.example.frame_layout;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
public class MainActivity extends AppCompatActivity implements View.OnClickListener {
```

```
ImageView i1,i2;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      i1=(ImageView) findViewById(R.id.imageView1);
      i2=(ImageView) findViewById(R.id.imageView2);
      i1.setOnClickListener(this);
      i2.setOnClickListener(this);
   }
   @Override
   public void onClick(View v) {
      if(v.getId()==R.id.imageView1)
      {
         i1.setVisibility(v.GONE);
         i2.setVisibility(v.VISIBLE);
      }
      else
      {
         i2.setVisibility(v.GONE);
         i1.setVisibility(v.VISIBLE);
      }
   }
}
```

Result : The program was executed successfully and the output was obtained.

Experiment No:9

Aim: Implement Options Menu to navigate to activities

Procedure:

activity_main.xml

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

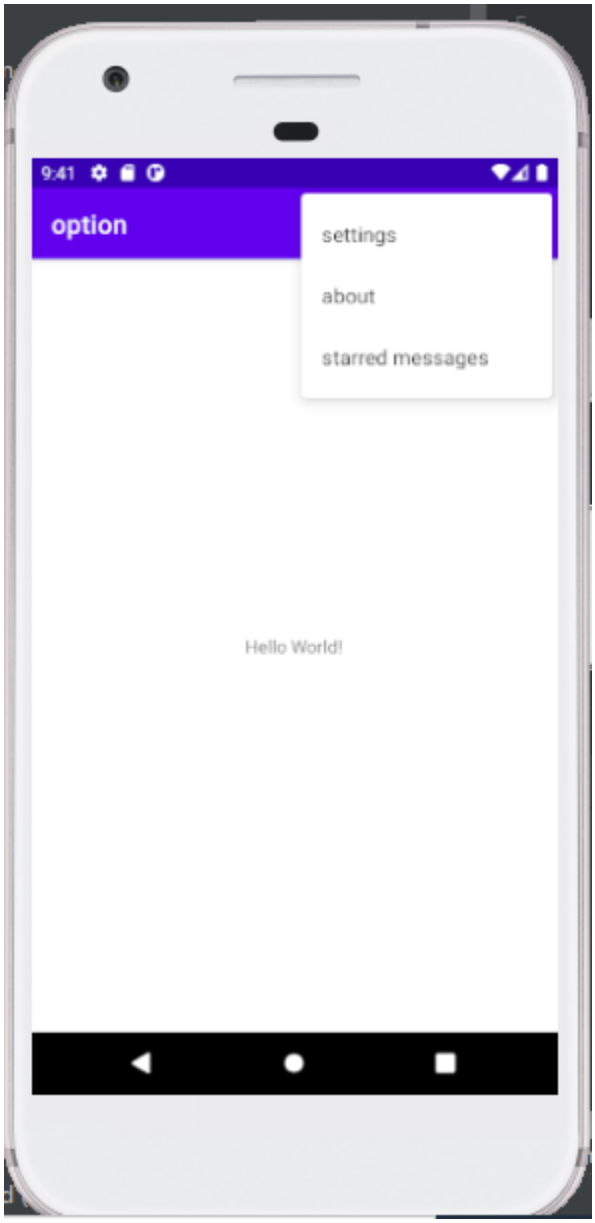
menu_main.xml

```
<?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>
```

activity_settingspage.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"
```

Output:



```
 android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".settingspage">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

settingspage.java

```
package com.example.option;
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_settingspage);
    }}
```

MainActivity.java

```
package com.example.option;
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",Toast.LENGTH_LONG).show();
            break;
            case R.id.msgs:
                Toast.makeText(this,"you clicked starred
messages",Toast.LENGTH_LONG).show();
                break;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

Result: The program was executed successfully and the output is obtained.

Experiment No:10

Aim: Develop an application that with explicit intent.

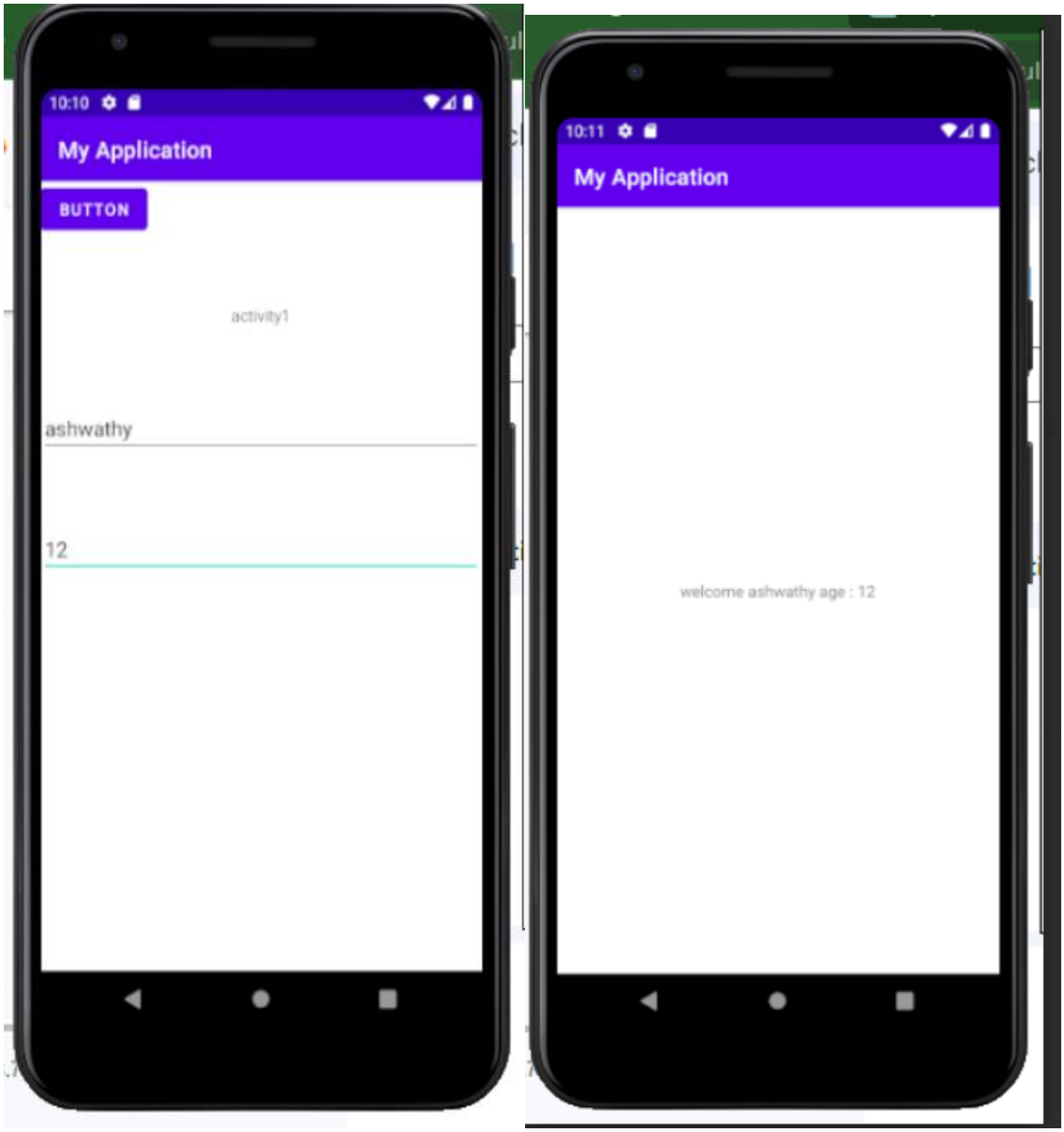
Procedure:

Activity_Main1.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">
   <Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:onClick="switchActivity"
      android:text="Button"
      app:layout_constraintBottom_toTopOf="@+id/editText1"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.498"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.5" />
   <EditText
      android:id="@+id/editText1"
      android:layout_width="0dp"
      android:layout_height="wrap_content"
      android:ems="10"
      android:text="Enter Your Name"
      app:layout_constraintTop_toBottomOf="@+id/button"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintEnd_toEndOf="parent" />

   <EditText
      android:id="@+id/editText2"
      android:layout_width="0dp"
      android:layout_height="wrap_content"
      android:ems="10"
      android:text="Enter age"
      app:layout_constraintTop_toBottomOf="@+id/editText1"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintEnd_toEndOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:


10:10
My Application
BUTTON
activity1
ashwathy
12
10:11
My Application
welcome ashwathy age : 12

Activity_main1.java

```
package com.example.myapplication;
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.editText1);
      age=findViewById(R.id.editText2);
   }
   public void switchActivity(View view){
      Intent intent=new Intent(this,MainActivity2.class);
      intent.putExtra("user",name.getText().toString());
      intent.putExtra("age",age.getText().toString());
      startActivity(intent);
   }}
```

Activity_Main2.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity2">

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Activity 2"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintBottom_toBottomOf="parent"
      android:layout_margin="16dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_Main2.java

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

Result: The program is executed successfully and the output is verified.

Experiment No:11

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

Procedure:

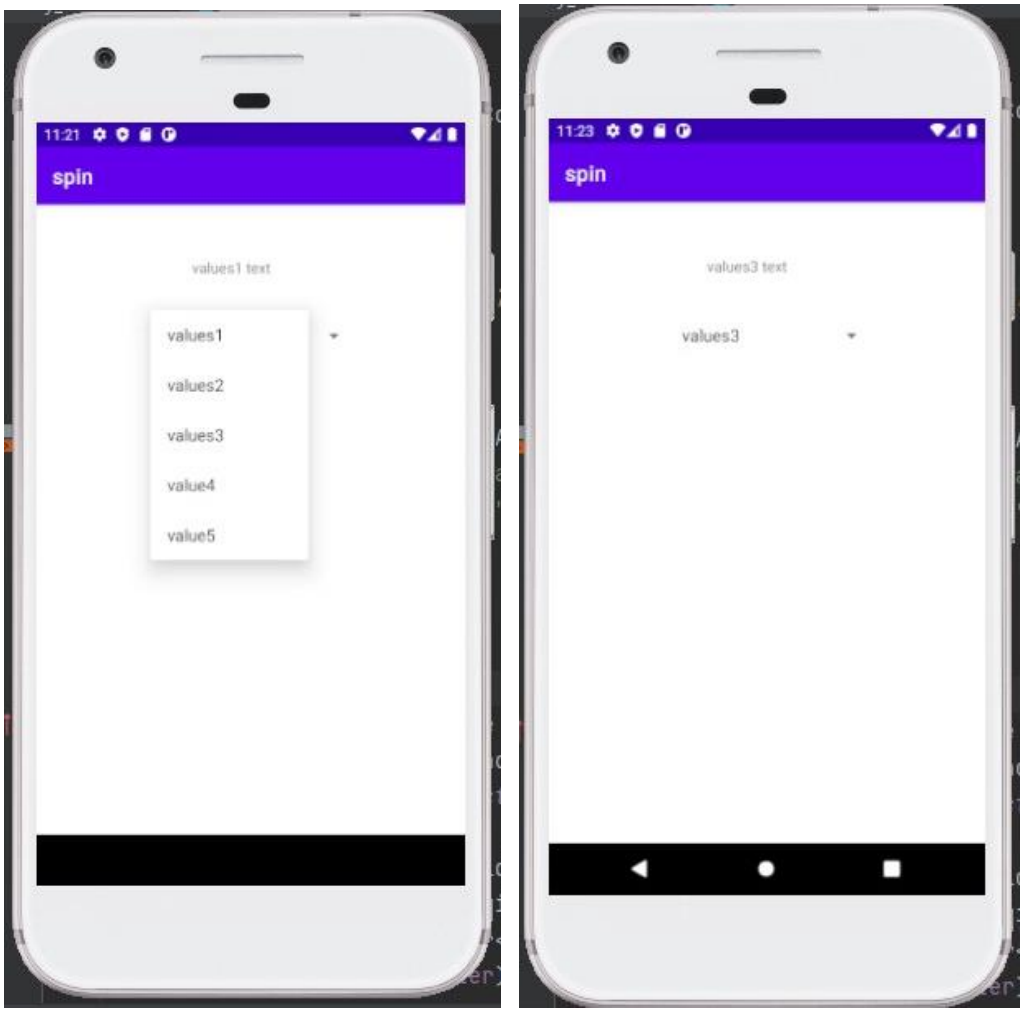
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">
   <TextView
      android:id="@+id/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>
```

Main_activity.java

```
package com.example.spin;
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 = {"values1","values2","values3","value4","value5"};
   String []text = {"values1 text","values2 text","values3 text","value4 text","value5 text"};
   ArrayAdapter<String> adapter;
   Spinner spinner;
   TextView textView;
   @Override
```

Output:


11:21
spin
values1 text
values1
values2
values3
value4
value5
11:23
spin
values3 text
values3

```
protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      spinner = findViewById(R.id.spinner2);
      textView = findViewById(R.id.textview1);
      adapter = new ArrayAdapter<String>(getApplicationContext(),
android.R.layout.simple_list_item_1,names);
      spinner.setAdapter(adapter);
      spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
        @Override
        public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
          switch (i)
          {
            case 0:
              textView.setText(""+text[i]);
              break;
            case 1:
              textView.setText(""+text[i]);
              break;
            case 2:
              textView.setText(""+text[i]);
              break;
            case 3:
              textView.setText(""+text[i]);
              break;
            case 4:
              textView.setText(""+text[i]);
              break;
          }
        }

        @Override
        public void onNothingSelected(AdapterView<?> adapterView) {

        }       });    }}
```

Result: The program is executed successfully and the output is verified.

Experiment No:12

Aim: Create database using SQLite and perform INSERT and SELECT.

Procedure:

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="STUDENT DETAILS"
      android:layout_centerHorizontal="true"
      />

   <EditText
      android:id="@+id/edit1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Rollno"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/textView"
      />

   <EditText
      android:id="@+id/edit2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:hint="Enter Name"
      android:layout_margin="10dp"
      android:layout_centerHorizontal="true"
      android:layout_below="@id/edit1"
      />

   <EditText
      android:id="@+id/edit3"
      android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:hint="Enter Department"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/edit2"
        />

    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="INSERT"
        android:onClick="onInsert"
        android:layout_margin="10dp"
        android:layout_centerHorizontal="true"
        android:layout_below="@id/edit3" />

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

</RelativeLayout>
```

MainActivity.java

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

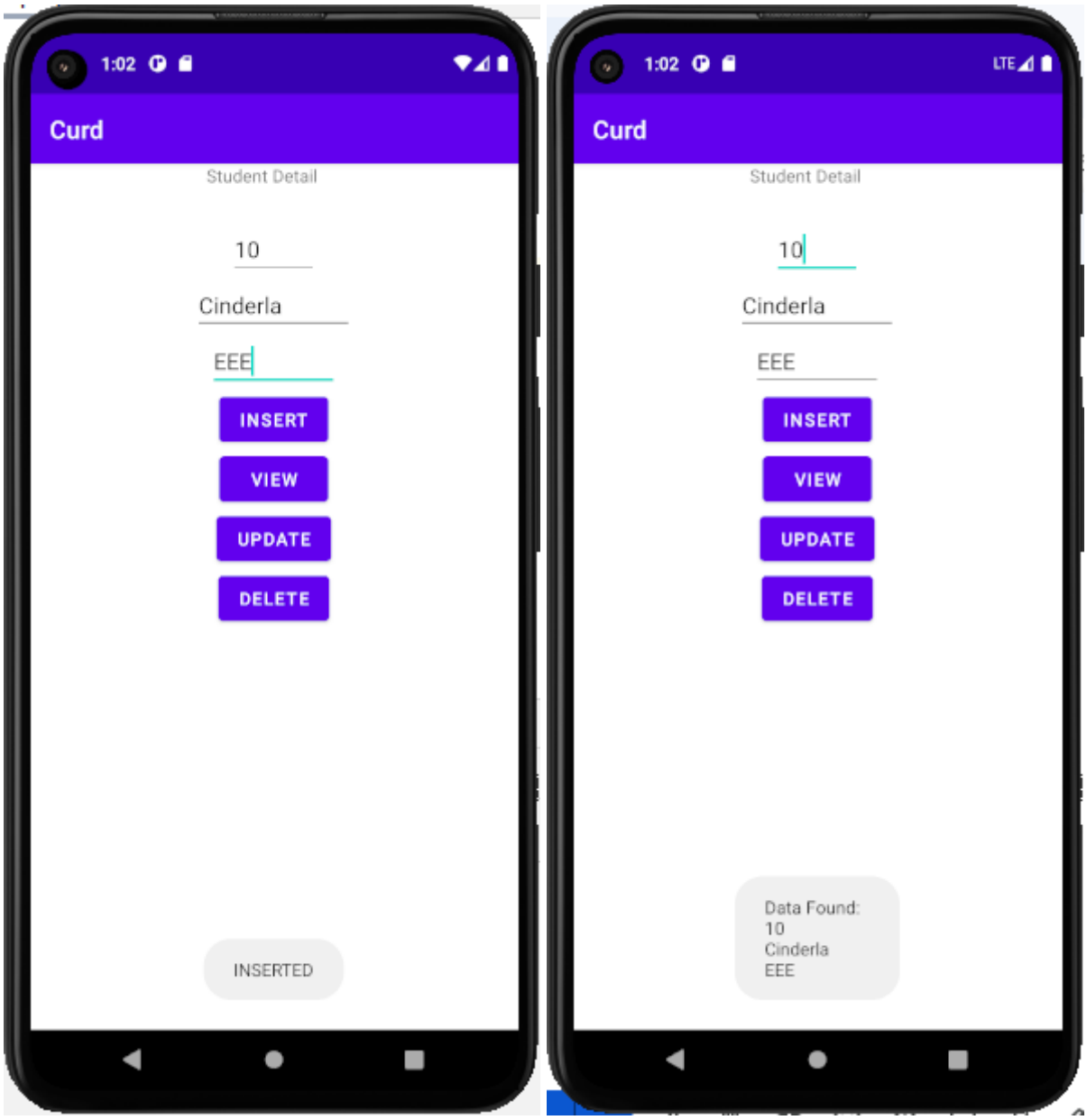
```
    SQLiteDatabase db;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        textView = findViewById(R.id.textView);
        edit1 = findViewById(R.id.edit1);
        edit2 = findViewById(R.id.edit2);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

DBHelper.java

```
package com.example.sql;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;
public class DBHelper extends SQLiteOpenHelper {
    public DBHelper(@Nullable Context context) {
        super(context, "student.db", null , 1 );
    }

    @Override
    public void onCreate(SQLiteDatabase sqLiteDatabase) {
        sqLiteDatabase.execSQL("create table student(rollno int, name varchar(20), dept
varchar(10))");
```

Output:


1:02
Curd
Student Detail
10
Cinderla
EEE
INSERT
VIEW
UPDATE
DELETE
INSERTED
1:02
LTE
Curd
Student Detail
10
Cinderla
EEE
INSERT
VIEW
UPDATE
DELETE
Data Found:
10
Cinderla
EEE

```
}

    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {
        sqLiteDatabase.execSQL("drop table if exists student");
        onCreate(sqLiteDatabase);
    }
}
```

Result: The program is executed successfully and the output is verified.