20MCA243

Mobile Application Development Lab

Lab Report Submitted By

VISHNU

AJC22MCA-2100

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 **VISHNU(AJC22MCA-2100)** in partial fulfilment of the requirements for the award of the Degree of Master of Computer Applications under APJ Abdul Kalam Technological University during the year **2023-24.**

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

VISION

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

MISSION

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

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

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

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

COURSE OUTCOME

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

COURSE END SURVEY

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

CONTENT

Experiment No.1

Aim:

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

CO1:

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

Procedure:

MainActivity.java

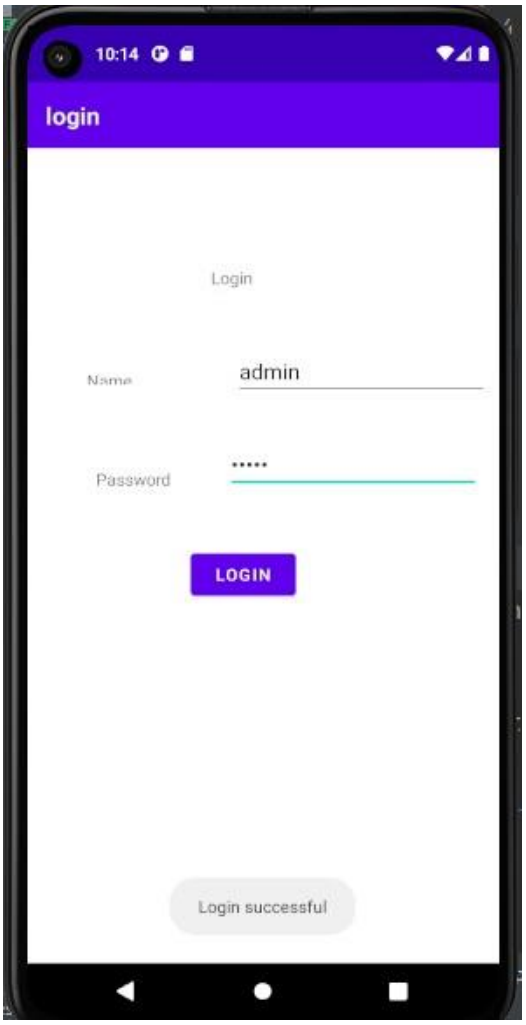
```
package com.example.login;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
TextView t1;
TextView t2;
Button b;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      t1=findViewById(R.id.id1);
      t2=findViewById(R.id.id2);
      b=findViewById(R.id.id3);
      b.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
            if(t1.getText().toString().equals("admin") &&  t2.getText().toString().equals("admin"))
            {
               Toast.makeText(MainActivity.this, "Login successful", Toast.LENGTH_SHORT).show();
            }
            else {
               Toast.makeText(MainActivity.this, "Login failed", Toast.LENGTH_SHORT).show();
            }
         }
      }); }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Username"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.143"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.255" />
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Password"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.135"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.344" />
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Login"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.405"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
```

```
    app:layout_constraintVertical_bias="0.164" />
  <EditText
    android:id="@+id/id1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.733"
    app:layout_constraintStart_toEndOf="@+id/textView3"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.253" />
  <EditText
    android:id="@+id/id2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="20dp"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.335" />
  <Button
    android:id="@+id/id3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Login"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output



Result

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

Experiment No. 2

Aim:

Write a program that demonstrates Activity Lifecycle.

CO1:

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

Procedure:

activity_main.xml

```
<?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>
```

MainActivity.java

```
package com.example.activity;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Log.d("Lifecycle", "onCreate invoked");
```

```
    }
    @Override
    protected void onStart() {
        super.onStart();
        Log.d("Lifecycle", "onStart invoked");
    }
    @Override
    protected void onResume() {
        super.onResume();
        Log.d("Lifecycle","onResume invoked");
    }
    @Override
    protected void onPause() {
        super.onPause();
        Log.d("Lifecycle","onPause");
    }
    @Override
    protected void onStop() {
        super.onStop();
        Log.d("Lifecycle","onStop");
    }
    @Override
    protected void onRestart() {
        super.onRestart();
        Log.d("Lifecycle","onRestart");
    }
    @Override
    protected void onDestroy() {
        super.onDestroy();
        Log.d("Lifecycle","onDestroy");
    }
}
```

Output

```
2023-10-21 09:32:39.483  3728-3728  Lifecycle           com.example.activity          D  onCreate invoked
2023-10-21 09:32:39.491  3728-3728  Lifecycle           com.example.activity          D  onStart invoked
2023-10-21 09:32:39.493  3728-3728  Lifecycle           com.example.activity          D  onResume invoked
```

```
2023-10-21 09:33:08.595  3728-3728  Lifecycle           com.example.activity          D  onPause
2023-10-21 09:33:09.181  3728-3728  Lifecycle           com.example.activity          D  onStop
2023-10-21 09:33:09.182  3728-3728  Lifecycle           com.example.activity          D  onDestroy
```

```
--------------------------- PROCESS STARTED (3728) for package com.example.activity ---------------------------
--------- beginning of kernel
--------- beginning of main
--------- beginning of system
--------- beginning of crash
2023-10-21 09:29:36.157  3728-3728  xample.activit          com.example.activity          I  Late-enabling -Xcheck:jni
2023-10-21 09:29:36.167  3728-3728  xample.activit          com.example.activity          I  Unquickening 12 vdex files!
2023-10-21 09:29:36.167  3728-3728  xample.activit          com.example.activity          W  Unexpected CPU variant for X86 using defaults: x86
2023-10-21 09:29:36.380  3728-3728  NetworkSecurityConfig   com.example.activity          D  No Network Security Config specified, using platform default
2023-10-21 09:29:36.380  3728-3728  NetworkSecurityConfig   com.example.activity          D  No Network Security Config specified, using platform default
2023-10-21 09:29:36.450  3728-3752  libEGL                  com.example.activity          D  loaded /vendor/lib/egl/libEGL_emulation.so
2023-10-21 09:29:36.452  3728-3752  libEGL                  com.example.activity          D  loaded /vendor/lib/egl/libGLESv1_CM_emulation.so
2023-10-21 09:29:36.466  3728-3752  libEGL                  com.example.activity          D  loaded /vendor/lib/egl/libGLESv2_emulation.so
2023-10-21 09:29:36.487  3728-3728  AppCompatDelegate       com.example.activity          D  Checking for metadata for AppLocalesMetadataHolderService : 
2023-10-21 09:29:36.576  3728-3728  xample.activit          com.example.activity          W  Accessing hidden method Landroid/view/View;->computeFitSyste
2023-10-21 09:29:36.576  3728-3728  xample.activit          com.example.activity          W  Accessing hidden method Landroid/view/ViewGroup;->makeOption
2023-10-21 09:29:36.645  3728-3728  Lifecycle               com.example.activity          D  onCreate invoked
2023-10-21 09:29:36.700  3728-3728  Lifecycle               com.example.activity          D  onStart invoked
2023-10-21 09:29:36.702  3728-3728  Lifecycle               com.example.activity          D  onResume invoked
```

Result

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

Experiment No.3

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

Procedure:

MainActivity.java

```
package com.example.calculator;
import androidx.appcompat.app.AppCompatActivity;
import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
   EditText et1, et2;
   Button b1, b2, b3, b4, b5,b6;
   TextView res;
   @SuppressLint("MissingInflatedId")
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      et1 = findViewById(R.id.num1);
      et2 = findViewById(R.id.num2);
      b1 = findViewById(R.id.plus);
      b2= findViewById(R.id.minus);
      b3= findViewById(R.id.mul);
      b4= findViewById(R.id.div);
      b5= findViewById(R.id.C);
      b6= findViewById(R.id.equal);
      res = findViewById(R.id.result);
      b1.setOnClickListener(new View.OnClickListener() {
         @Override
```

```
        public void onClick(View view) {
            calculate('+');
        }
    });
    b2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            calculate('-');
        }
    });
    b3.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            calculate('*');
        }
    });
    b4.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            calculate('/');
        }
    });
    b5.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            et1.setText("");
            et2.setText("");
            res.setText("Result: ");
        }
    });
    b6.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            calculate('=');
        }
    });
}
private void calculate(char operator) {
    String str1 = et1.getText().toString();
    String str2 = et2.getText().toString();
    if (str1.isEmpty() || str2.isEmpty()) {
        res.setText("Result: Please enter both numbers.");
```

```
            return;
        }
        double num1 = Double.parseDouble(str1);
        double num2 = Double.parseDouble(str2);
        double total = 0.0;
        switch (operator) {
            case '+':
                total = num1 + num2;
                break;
            case '-':
                total = num1 - num2;
                break;
            case '*':
                total = num1 * num2;
                break;
            case '/':
                if (num2 == 0) {
                    res.setText("Result: Cannot divide by zero.");
                    return;
                }
                total = num1 / num2;
                break;
            case '=':
                break;
        }
        res.setText("Result: " + total);
    }}
```

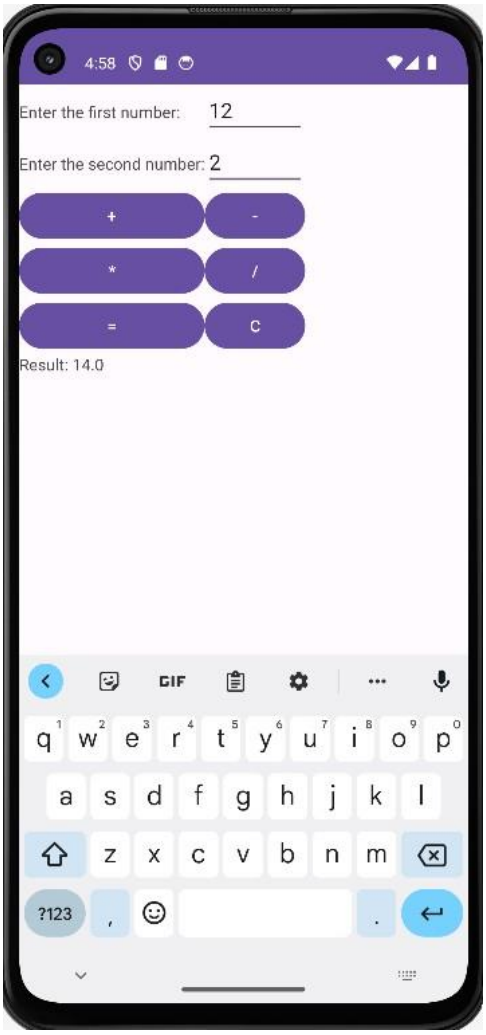
activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<TableLayout 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"
    tools:context=".MainActivity">
    <TableRow
        android:layout_width="wrap_content"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:text="@string/n1"
        />
    <EditText
        android:id="@+id/num1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        />
  </TableRow>
  <TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/n2"
        />
    <EditText
        android:id="@+id/num2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        />
  </TableRow>
  <TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content">
    <Button
        android:id="@+id/plus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="+" />
    <Button
        android:id="@+id/minus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="-" />
  </TableRow>
  <TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content">
    <Button
        android:id="@+id/mul"
```

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="*" />
    <Button
        android:id="@+id/div"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="/" />
  </TableRow>
  <TableRow
    android:layout_width="wrap_content"
    android:layout_height="wrap_content">
    <Button
        android:id="@+id/equal"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="=" />
    <Button
        android:id="@+id/C"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="C" />
  </TableRow>
  <TableRow>
    <TextView
        android:id="@+id/result"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Result: " />
  </TableRow>
</TableLayout>
```

Output



Result

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

Experiment No.4

Aim:

Implement validations on various UI controls.

CO1:

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

Procedure:

MainActivity.java

```
package com.example.validation;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import java.util.regex.Pattern;
public class MainActivity extends AppCompatActivity {
   private EditText usernameEditText;
   private EditText emailEditText;
   private EditText phoneEditText;
   private EditText passwordEditText;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      usernameEditText = findViewById(R.id.id1);
      emailEditText = findViewById(R.id.id2);
      phoneEditText = findViewById(R.id.id3);
      passwordEditText = findViewById(R.id.id4);
   }
   public void validateInputs(View view) {
      String username = usernameEditText.getText().toString().trim();
      String email = emailEditText.getText().toString().trim();
      String phone = phoneEditText.getText().toString().trim();
      String password = passwordEditText.getText().toString();
      if (!isValidUsername(username)) {
         showToast("Invalid username");
      } else if (!isValidEmail(email)) {
```

```
            showToast("Invalid email address");
        } else if (!isValidPhoneNumber(phone)) {
            showToast("Invalid phone number");
        } else if (!isValidPassword(password)) {
            showToast("Invalid password");
        } else {
            showToast("All inputs are valid");
        }
    }
    private void showToast(String message) {
        Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
    }
    private boolean isValidUsername(String username) {
        return username.matches("^[a-zA-Z]+$");
    }
    private boolean isValidEmail(String email) {
        String emailPattern = "^[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\\.[a-zA-Z]{2,}$";
        return Pattern.matches(emailPattern, email);
    }
    private boolean isValidPhoneNumber(String phone) {
        String phonePattern = "^[0-9]{10}$";
        return Pattern.matches(phonePattern, phone);
    }
    private boolean isValidPassword(String password) {
        return password.matches("^(?=.*[a-zA-Z])(?=.*[0-9])(?=.*[@#$%^&+=])");
    }
}
```

activity_main.xml

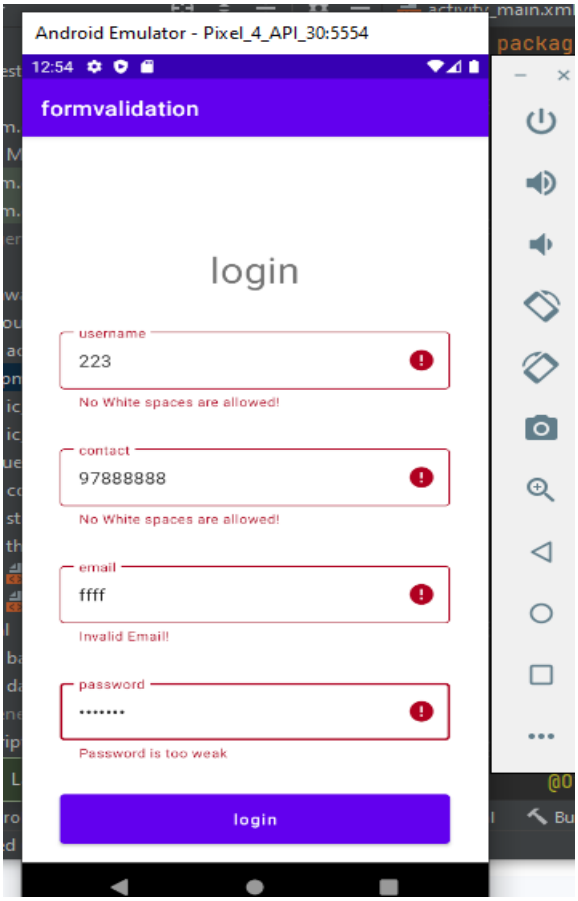
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Username"
```

```
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.144"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.143" />
  <TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Email"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.144"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.234" />
  <TextView
    android:id="@+id/textView4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Phone"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.144"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.321" />
  <TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Password"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.144"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.417" />
  <EditText
    android:id="@+id/id1"
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.81"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.132" />
  <EditText
    android:id="@+id/id2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.586"
    app:layout_constraintStart_toEndOf="@+id/textView3"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.22" />
  <EditText
    android:id="@+id/id3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.586"
    app:layout_constraintStart_toEndOf="@+id/textView4"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.31" />
  <EditText
    android:id="@+id/id4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
```

```
        android:text=""
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.586"
        app:layout_constraintStart_toEndOf="@+id/textView2"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.395" />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/id4"
        android:onClick="validateInputs"
        android:text="Validate Inputs"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.534" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output



Result

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

Experiment No.5

Aim:

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

CO2:

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

Procedure:

MainActivity.java

```
package com.example.sharedpreference;
import androidx.appcompat.app.AppCompatActivity;
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;
public class MainActivity extends AppCompatActivity {
   EditText username, pass;
   Button Login_Button;
   SharedPreferences Shared_pref;
   Intent intent;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      username = findViewById(R.id.Name);
      pass = findViewById(R.id.password);
      Login_Button = findViewById(R.id.Login);
      Shared_pref = getSharedPreferences("user_details", MODE_PRIVATE);
      intent = new Intent(MainActivity.this, SecondActivity.class);
      if (Shared_pref.contains("username") && Shared_pref.contains("password")) {
         startActivity(intent);
      }
      Login_Button.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
```

```
            String username = MainActivity.this.username.getText().toString();
            String password = pass.getText().toString();
            if (username.equals("Rijul") && password.equals("123")) {
                SharedPreferences.Editor editor = Shared_pref.edit();
                editor.putString("username", username);
                editor.putString("password", password);
                editor.commit();
                Toast.makeText(getApplicationContext(), "Logged in",
Toast.LENGTH_SHORT).show();
                startActivity(intent);
            }else {
                Toast.makeText(getApplicationContext(), "Enter Right Credentials",
Toast.LENGTH_SHORT).show();
            }
        }
    });
  }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Username"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.2"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.206" />
  <TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:text="Password"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.22"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.285" />
  <EditText
    android:id="@+id/Name"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.561"
    app:layout_constraintStart_toEndOf="@+id/textView2"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.176" />
  <EditText
    android:id="@+id/password"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:ems="10"
    android:inputType="text"
    android:text=""
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.615"
    app:layout_constraintStart_toEndOf="@+id/textView"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.258" />
  <Button
    android:id="@+id/Login"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Login"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.537"
```

```
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.428" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_second.xml

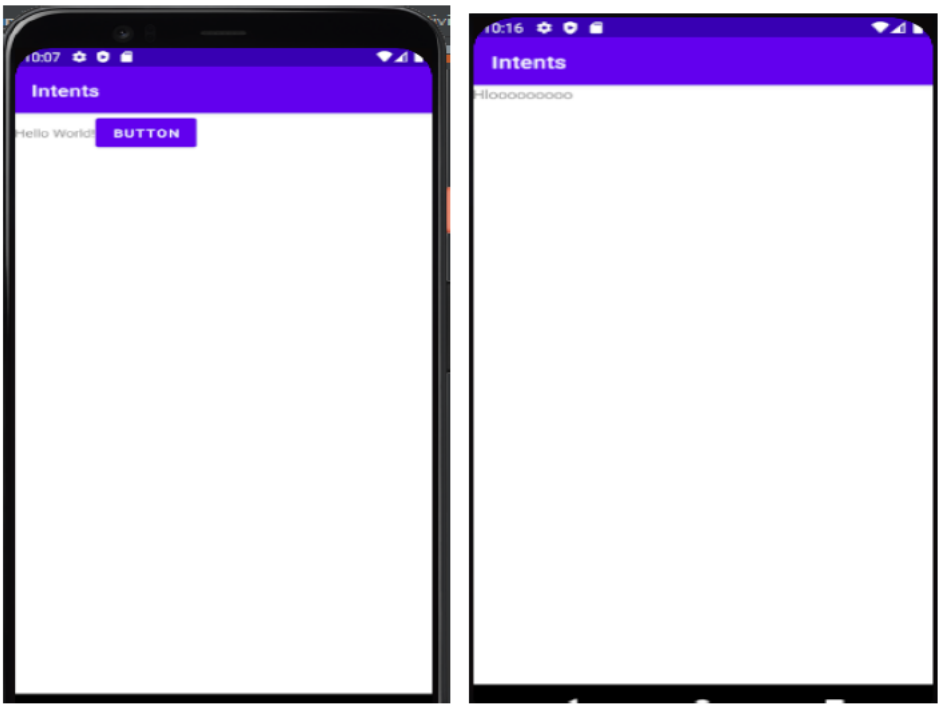
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".SecondActivity">
  <TextView
    android:id="@+id/res_text"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:layout_marginTop="170dp"
    android:textSize="22dp" />
  <Button
    android:id="@+id/LogOut"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:layout_marginTop="25dp"
    android:text="Log Out" />
</LinearLayout>
```

SecondActivity.java

```
package com.example.sharedpreference;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
public class SecondActivity extends AppCompatActivity {
  SharedPreferences newPreference;
  Intent newIntent;
  @Override
```

```
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);
        TextView result = findViewById(R.id.res_text);
        Button LogOut_btn = findViewById(R.id.LogOut);
        SharedPreferences newPreference = getSharedPreferences("user_details", MODE_PRIVATE);
        newIntent = new Intent(SecondActivity.this, MainActivity.class);
        result.setText("Welcome, " + newPreference.getString("username", null));
        LogOut_btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                SharedPreferences.Editor edit = newPreference.edit();
                edit.clear();
                edit.commit();
                startActivity(newIntent);
            }
        });
    }
}
```

Output



Result

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

Experiment No.6

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:

ativity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:paddingLeft="16dp"
   android:paddingTop="16dp"
   android:paddingRight="16dp"
   android:paddingBottom="16dp"
   android:background="#1877f2"
   tools:context=".MainActivity">
<ImageView
   android:id="@+id/profileImage"
   android:layout_width="100dp"
   android:layout_height="100dp"
   android:src="@drawable/fb"
   android:layout_centerHorizontal="true"
   android:layout_marginTop="16dp"/>
<TextView
   android:id="@+id/username"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Amal Thomson"
   android:textColor="#ffffff"
   android:textSize="18sp"
   android:layout_below="@id/profileImage"
   android:layout_centerHorizontal="true"
   android:layout_marginTop="8dp"/>
```

```
<Button
   android:id="@+id/postButton"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Create Post"
   android:textColor="#ffffff"
   android:layout_below="@id/username"
   android:layout_centerHorizontal="true"
   android:layout_marginTop="16dp"/>
<EditText
   android:id="@+id/postEditText"
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_below="@id/postButton"
   android:hint="What's on your mind?"
   android:textColor="#ffffff"
   android:layout_marginTop="16dp"
   android:padding="8dp"/>
<Button
   android:id="@+id/photoButton"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Add Photo"
   android:textColor="#ffffff"
   android:layout_below="@id/postEditText"
   android:layout_marginTop="8dp"/>
<Button
   android:id="@+id/checkInButton"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Check In"
   android:textColor="#ffffff"
   android:layout_below="@id/photoButton"
   android:layout_marginTop="8dp"/>
</RelativeLayout>
```

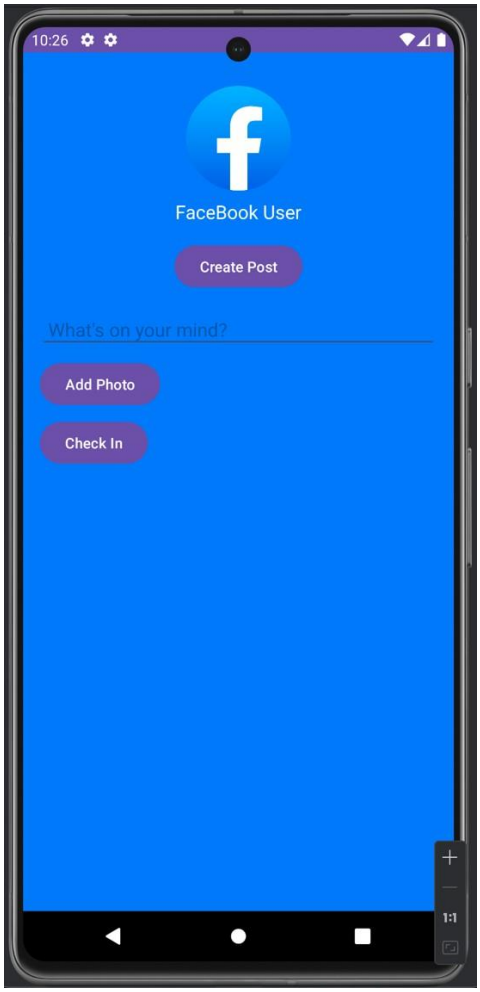
MainActivity.java

```
package com.example.facebookui;
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 postEditText;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Button postButton = findViewById(R.id.postButton);
      Button photoButton = findViewById(R.id.photoButton);
      Button checkInButton = findViewById(R.id.checkInButton);
      postEditText = findViewById(R.id.postEditText);
      postButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            createPost();
         }
      });
      photoButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            addPhoto();
         }
      });
      checkInButton.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            checkIn();
         }
      });
   }
   private void createPost() {
      String postText = postEditText.getText().toString().trim();
      if (!postText.isEmpty()) {
         Toast.makeText(this, "Post created: " + postText, Toast.LENGTH_SHORT).show();
         postEditText.getText().clear();
      } else {
         Toast.makeText(this, "Please enter something to post.", Toast.LENGTH_SHORT).show();
      }
   }
   private void addPhoto() {
      Toast.makeText(this, "Adding a photo", Toast.LENGTH_SHORT).show();
```

```
    }
    private void checkIn() {
        Toast.makeText(this, "Checked In", Toast.LENGTH_SHORT).show();
    }
}
```

Output



Result

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

Experiment No.7

Aim:

Develop an application that toggles image using FrameLayout.

CO2:

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

Procedure:

Activity_main.xml

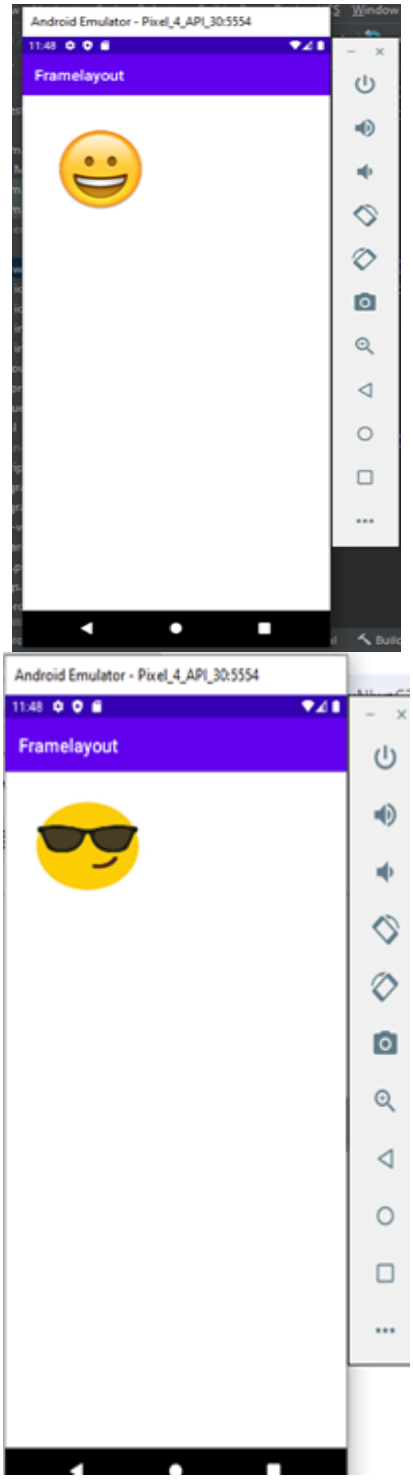
```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity"
   android:orientation="vertical">
  <ImageView
     android:id="@+id/id1"
     android:layout_width="match_parent"
     android:layout_height="match_parent"
     android:src="@drawable/sm3"
     />
  <ImageView
     android:id="@+id/id2"
     android:layout_width="match_parent"
     android:layout_height="match_parent"
     android:src="@drawable/sm2"/>
</FrameLayout>
```

MainActivity.java

```
package com.example.frame;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
public class MainActivity extends AppCompatActivity {
ImageView im1;
   ImageView im2;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_main);
        im1=findViewById(R.id.id1);
        im2=findViewById(R.id.id2);
        im1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                im2.setVisibility(View.VISIBLE);
                im1.setVisibility(View.GONE);
            }
        });
        im2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                im1.setVisibility(View.VISIBLE);
                im2.setVisibility(View.GONE);
            }
        });
    }
}
```

Output



Result

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

Experiment No. 8

Aim:

Implement Adapters and perform exception handling.

CO3:

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

Procedure:

MainActivity.java

```
package com.example.adapters_eventhandling;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
   private EditText Number1, Number2;
   private Button Add;
   private TextView Result;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Number1 = findViewById(R.id.Number1);
      Number2 = findViewById(R.id.Number2);
      Add = findViewById(R.id.btnAdd);
      Result = findViewById(R.id.Result);
      Add.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            try {
               String strNumber1 = Number1.getText().toString();
               String strNumber2 = Number2.getText().toString();
               double num1 = Double.parseDouble(strNumber1);
               double num2 = Double.parseDouble(strNumber2);
               if (num1 >= 0 && num2 >= 0) {
                  double result = num1 + num2;
                  Result.setText("Result: " + result);
```

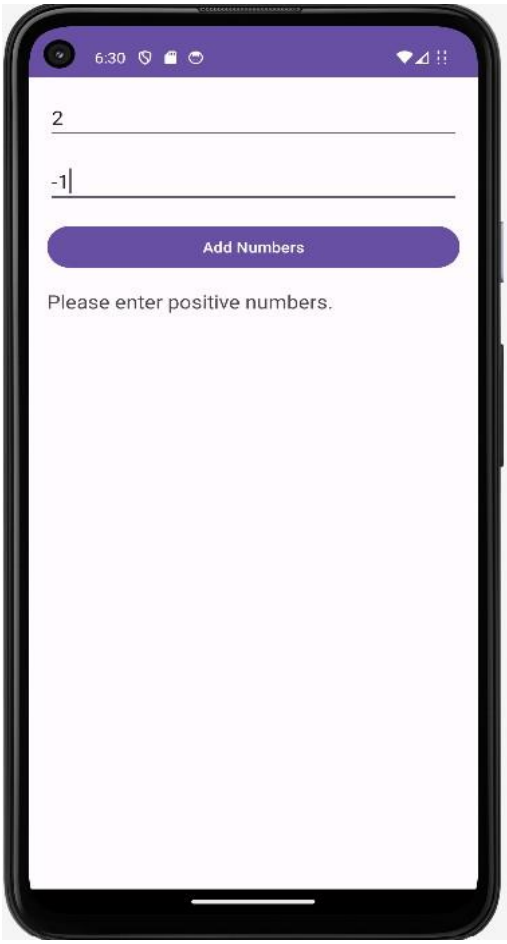
```
            } else {
                Result.setText("Please enter positive numbers.");
            }
        } catch (NumberFormatException e) {
            Result.setText("Invalid input. Please enter valid numbers.");
        } catch (Exception e) {
            Result.setText("An error occurred. Please try again.");
            e.printStackTrace();
        }
      }
    });
    }
}
```

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:padding="16dp"
  tools:context=".MainActivity">
  <EditText
    android:id="@+id/Number1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter number 1"
    />
  <EditText
    android:id="@+id/Number2"
    android:layout_below="@id/Number1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"
    android:hint="Enter number 2"
    />
  <Button
    android:id="@+id/btnAdd"
    android:layout_below="@id/Number2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"
```

```
        android:text="Add Numbers" />
    <TextView
        android:id="@+id/Result"
        android:layout_below="@id/btnAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:text="Result: "
        android:textSize="18sp" />
</RelativeLayout>
```

Output



Result

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

Experiment No. 9

Aim:

Implement Intent to navigate between multiple 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:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Name"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.127"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.176" />
   <EditText
      android:id="@+id/id1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:ems="10"
      android:inputType="textPersonName"
      android:text=""
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.337"
      app:layout_constraintStart_toEndOf="@+id/textView"
```

```
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.157" />

   <Button
      android:id="@+id/id2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Button"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.429"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.3" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.intent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
   Button b;
   EditText t;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      b=findViewById(R.id.id2);
      t=findViewById(R.id.id1);
      b.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View view) {
            String val=t.getText().toString();
            Intent i=new Intent(MainActivity.this,second_activity.class);
            i.putExtra("Name",val);
            startActivity(i);
         }
      });
```

```
    }
}
```

activity_second.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=".second_activity">
    <EditText
        android:id="@+id/id3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:text=""
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.26" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

SecondACTIVITY.JAVA

```
package com.example.intent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.widget.EditText;
public class second_activity extends AppCompatActivity {
EditText t;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);
        t=findViewById(R.id.id3);
        Intent i=getIntent();
        String nam=i.getStringExtra("Name");
        t.setText(nam);
    }
```

}

Output

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:

ativity_main.xml

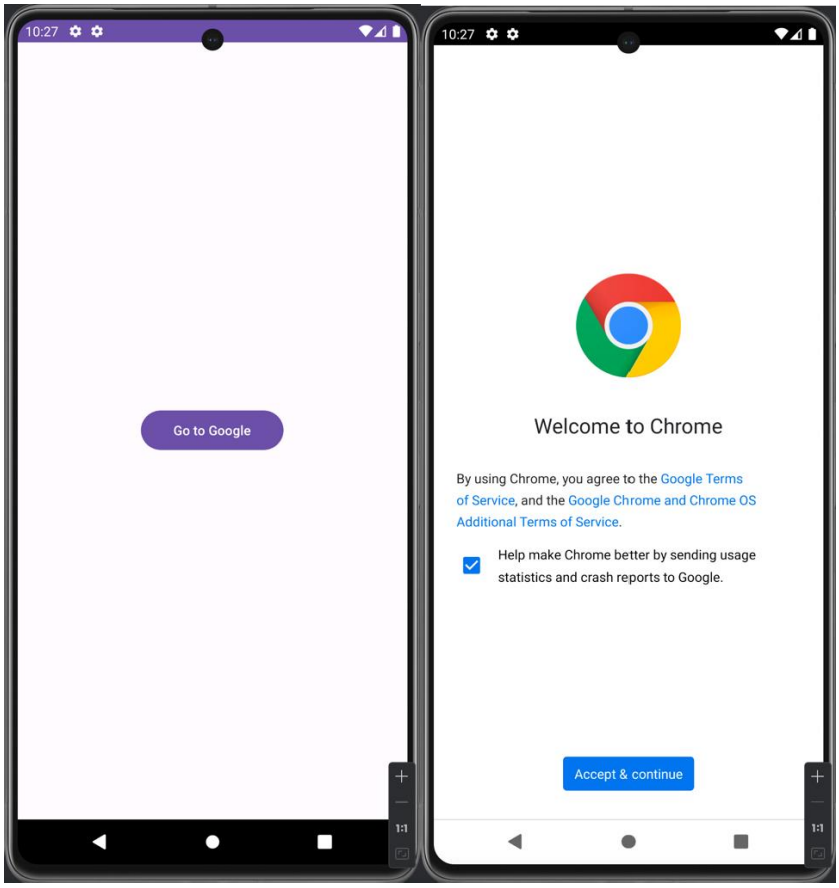
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">
   <Button
      android:id="@+id/btn"
      android:layout_width="150dp"
      android:layout_height="50dp"
      android:text="Go to Google"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.498"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.499" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.intent;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import  android.net.Uri;
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 btn = findViewById(R.id.btn);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent i = new Intent(Intent.ACTION_VIEW, Uri.parse("https://www.google.com"));
                startActivity(i);
            }
        });
    }
}
```

Output



Result

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

Experiment No. 11

Aim:

Implement Options Menu to navigate to activities.

CO3:

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

Procedure:

MainActivity.java

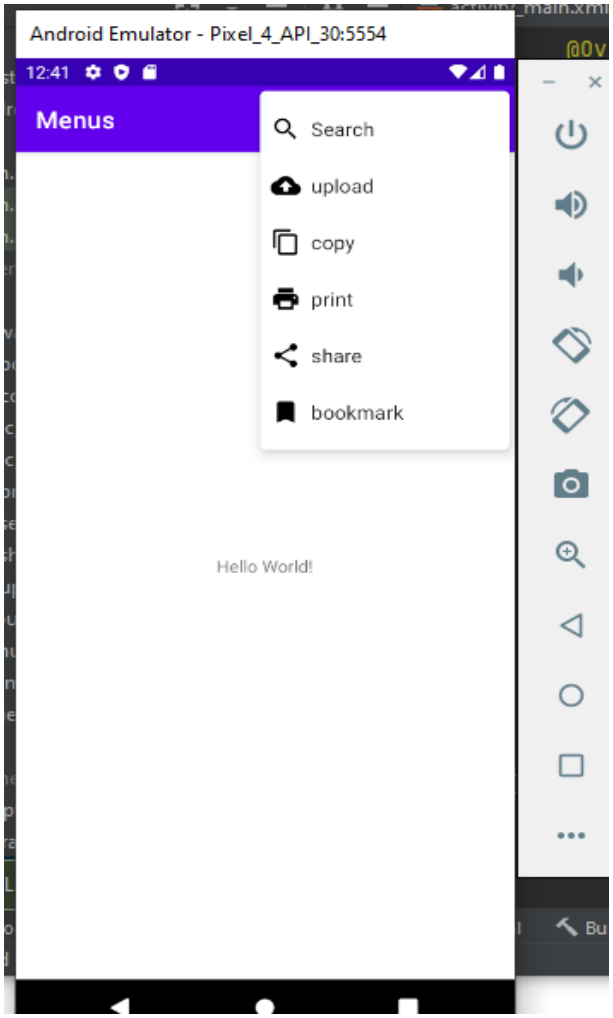
```
package com.example.menus;
import androidx.annotation.NonNull;
import  androidx.appcompat.app.AppCompatActivity;
import  androidx.appcompat.view.menu.MenuBuilder;
import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
   }
   @SuppressLint("RestrictedApi")
   @Override
   public boolean onCreateOptionsMenu(Menu menu) {
      MenuInflater inflater = getMenuInflater();
      inflater.inflate(R.menu.option_menu,menu);
      if(menu instanceof MenuBuilder)
      {
         MenuBuilder n=(MenuBuilder) menu;
         n.setOptionalIconsVisible(true);
      }
      return super.onCreateOptionsMenu(menu);
   }
   @Override
   public boolean onOptionsItemSelected(@NonNull MenuItem item) {
      Toast.makeText(this, "Selected Item" + item.getTitle(), Toast.LENGTH_SHORT).show();
      switch(item.getItemId())
      {
```

```
            case R.id.id1:return true;
            case R.id.id2:return true;
            case R.id.id3:return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

option_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    tools:content=".MainActivity">
    <item android:id="@+id/search_item"
        android:title="Search"
        android:icon="@drawable/search"/>
    <item android:id="@+id/upload_item"
        android:title="upload"
        android:icon="@drawable/upload"/>
    <item android:id="@+id/copy_item"
        android:title="copy"
        android:icon="@drawable/copy"/>
    <item android:id="@+id/print_item"
        android:title="print"
        android:icon="@drawable/print"/>
    <item android:id="@+id/share_item"
        android:title="share"
        android:icon="@drawable/share"/>
    <item android:id="@+id/bookmark_item"
        android:title="bookmark"
        android:icon="@drawable/bookmark"/>

</menu>
    :title="brightness"/>
 </menu>
```

Output



Result

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

Experiment No.12

Aim:

Develop an application that uses ArrayAdapter with ListView.

CO3:

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

Procedure:

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<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/id1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:divider="#000"
      android:dividerHeight="1dp"
   />
</RelativeLayout>
```

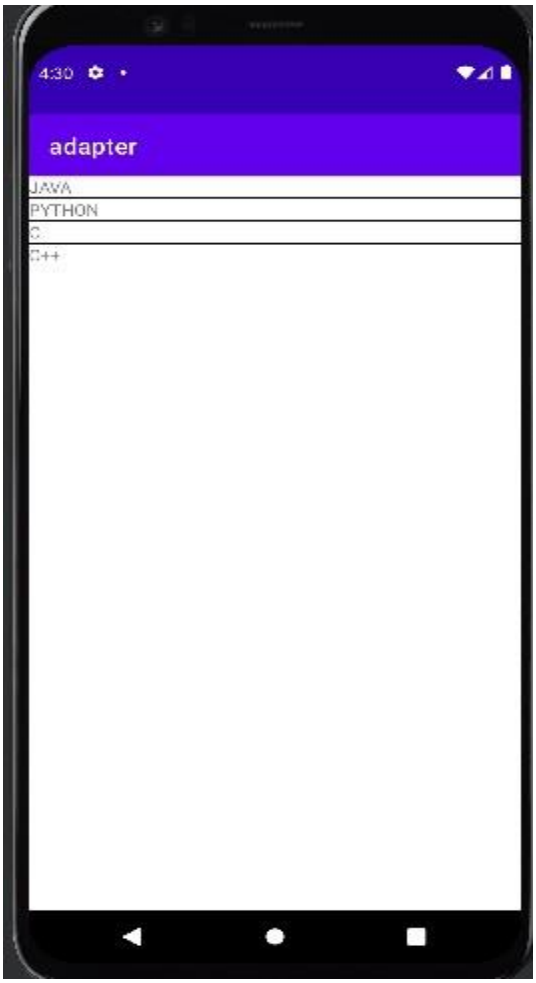
activity_list_items.xml

```
<?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=".list_items">
   <TextView
      android:id="@+id/list1"
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      />
</RelativeLayout>
```

MainActivity.java

```
package com.example.adapter;
import androidx.appcompat.app.AppCompatActivity;
import android.hardware.lights.LightState;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
ListView simplelist;
String course[]={
        "JAVA",
        "PYTHON",
        "C",
        "C++"
};
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        simplelist=(ListView) findViewById(R.id.id1);
        ArrayAdapter<String> ad=new
ArrayAdapter<String>(this,R.layout.activity_list_items,R.id.list1,course);
        simplelist.setAdapter(ad);
        simplelist.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {
                String item=(String)simplelist.getItemAtPosition(i);
                Toast.makeText(getApplicationContext(), "YOUR SELECTED ITEMS ARE:",
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

Output



Result

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

Experiment No. 13

Aim:

Develop an application that use GridView with images and display Alert box on selection.

CO4:

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

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">
   <GridView
      android:id="@+id/gridview"
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      android:padding="20dp"
      android:numColumns="auto_fit"
      android:horizontalSpacing ="60dp"
      android:verticalSpacing="12dp" />
</RelativeLayout>
```

activity_grid_view.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=".grid_view">
   <ImageView
   android:id="@+id/fruit_img"
   android:layout_width="120dp"
   android:layout_height="120dp"
   android:scaleType="centerCrop" />
```

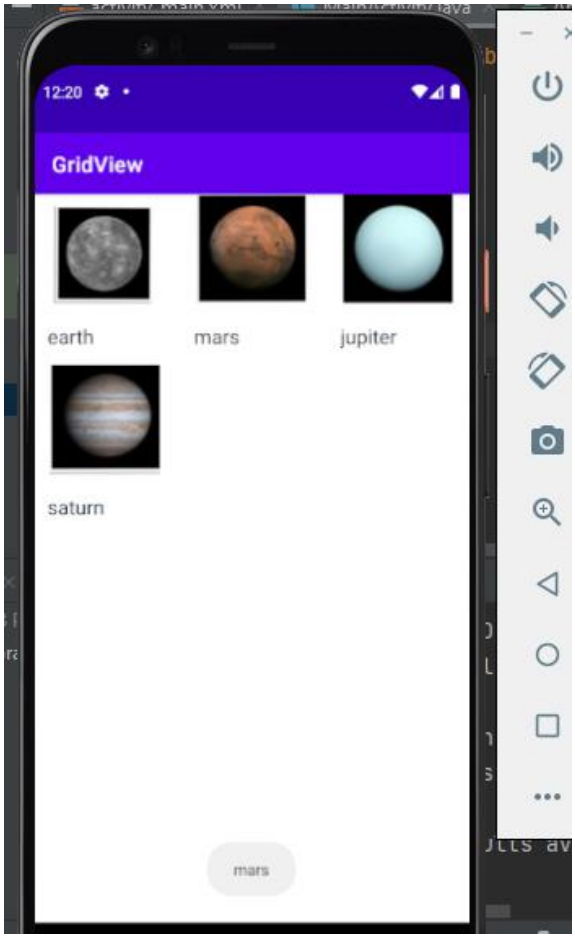
```
   <TextView
   android:id="@+id/fruit_name"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:textSize="18sp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.imagegridview;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.view.ViewGroup;
import android.widget.BaseAdapter;
import android.widget.GridView;
import android.widget.ImageView;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
   String fruit[]={"earth","mars","jupiter","saturn"};
   int[] fruitimages={R.drawable.apple, R.drawable.mango,R.drawable.orange,R.drawable.grapes};
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      GridView g=(GridView)findViewById(R.id.gridview);
      CustomAdapter c=new CustomAdapter();
      g.setAdapter(c);
      }
      private class CustomAdapter extends BaseAdapter{
         @Override
         public int getCount(){
            return fruit.length;
         }
         @Override
         public Object getItem(int position){
            return fruitimages[position];}
         @Override
         public long getItemId(int position) {
            return position;
         }
         @Override
         public View getView(int position, View convertView, ViewGroup parent) {
```

```
            View gridViewItem = getLayoutInflater().inflate(R.layout.activity_grid_view, null);
            ImageView imageView = gridViewItem.findViewById(R.id.fruit_img);
            TextView textView = gridViewItem.findViewById(R.id.fruit_name);
            imageView.setImageResource(fruitimages[position]);
            textView.setText(fruit[position]);
            return gridViewItem;
        }
    };

    }
```

Output



Result

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

Experiment No.14

Aim:

Develop an application that implements Spinner component and perform event handling.

CO4:

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

Procedure:

activity_main.xml

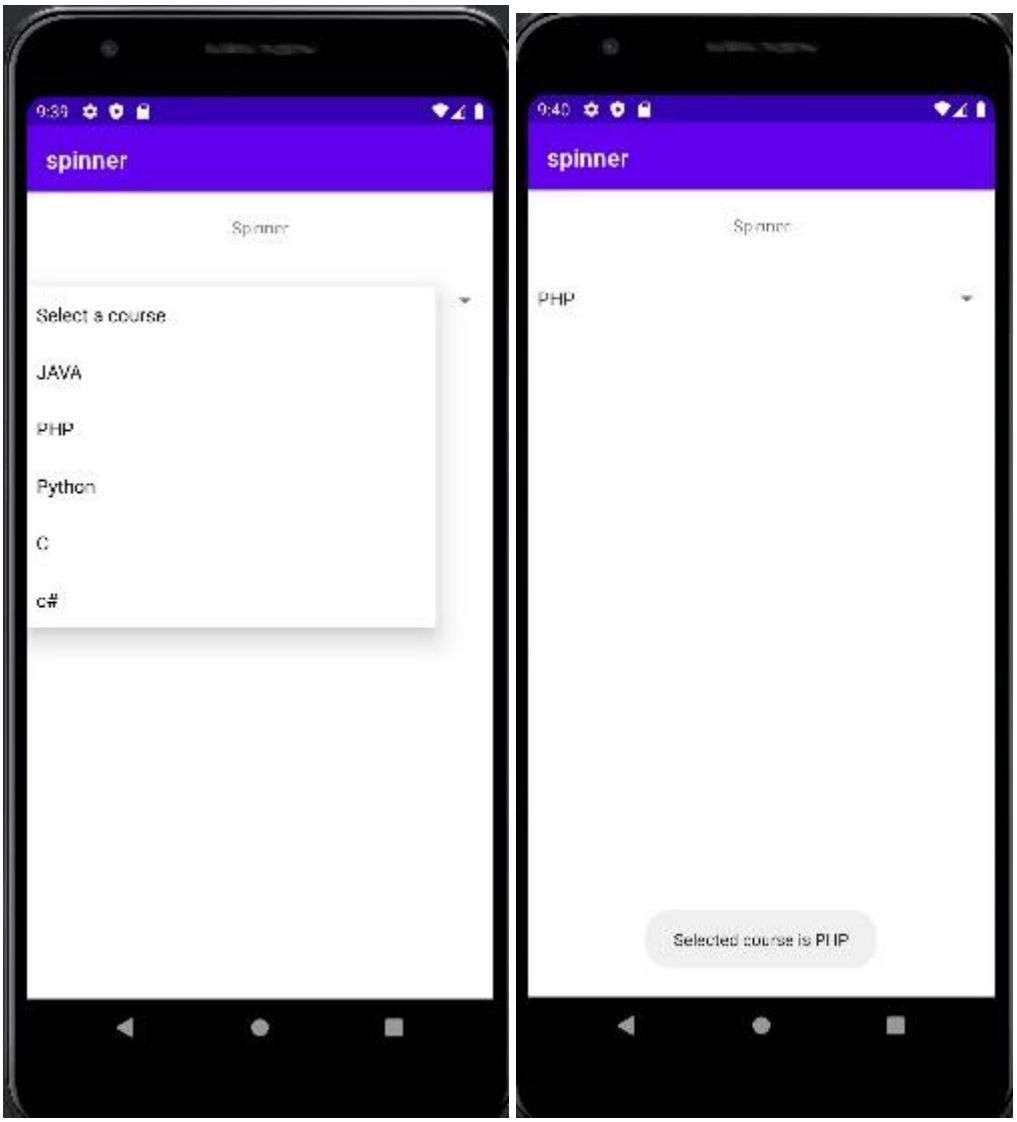
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   tools:context=".MainActivity">
   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:gravity="center"
      android:text="Spinner"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.475"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.2"
      android:layout_marginTop="20dp"/>/>
   <Spinner
      android:id="@+id/spinner"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:orientation="vertical"
      android:layout_marginTop="40dp"/>
</LinearLayout>
```

MainActivity.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.Toast;
public class MainActivity extends AppCompatActivity {
Spinner spinner;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      spinner=findViewById(R.id.spinner);
      String[] courses={"Select a course","JAVA","PHP","PYTYHON","C","c#"};
      ArrayAdapter<String> sp=new
ArrayAdapter<>(this,android.R.layout.simple_spinner_item,courses);
      sp.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
      spinner.setAdapter(sp);
      spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
         @Override
         public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
            if(i !=0)
            {
               Toast.makeText(MainActivity.this, "Selected course is "+courses[i],
Toast.LENGTH_SHORT).show();
            }
         }
         @Override
         public void onNothingSelected(AdapterView<?> adapterView) {
         }
      });
   }
}
```

Output



Result

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

Experiment No. 15

Aim:

Develop application using Fragments.

CO4:

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

Procedure:

ativity_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:padding="16dp">
   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:orientation="vertical"
      android:gravity="center">
      <Button
         android:id="@+id/FragmentOne"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="Fragment One" />
      <Button
         android:id="@+id/FragmentTwo"
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="Fragment Two" />
   </LinearLayout>
   <FrameLayout
      android:id="@+id/fragment"
      android:layout_width="match_parent"
      android:layout_height="0dp"/>
</LinearLayout>
```

fragment_one.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:gravity="center">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Active Fragment is FragmentOne"
        android:textSize="24sp"/>
</LinearLayout>
```

fragment_two.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:gravity="center">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Active Fragment is FragmentTwo"
        android:textSize="24sp"/>
</LinearLayout>
```

MainActivity.java

```
package com.example.fragmemtandroid;
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 FragmentOne = findViewById(R.id.FragmentOne);
        Button FragmentTwo = findViewById(R.id.FragmentTwo);
        FragmentOne.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                loadFragment(new FragmentOne());
            }
        });
```

```
        FragmentTwo.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                loadFragment(new FragmentTwo());
            }
        });
    }
    private void loadFragment(androidx.fragment.app.Fragment fragment) {
        getSupportFragmentManager().beginTransaction()
                .replace(R.id.fragment, fragment)
                .commit();
    }
}
```

FragmentOne.java

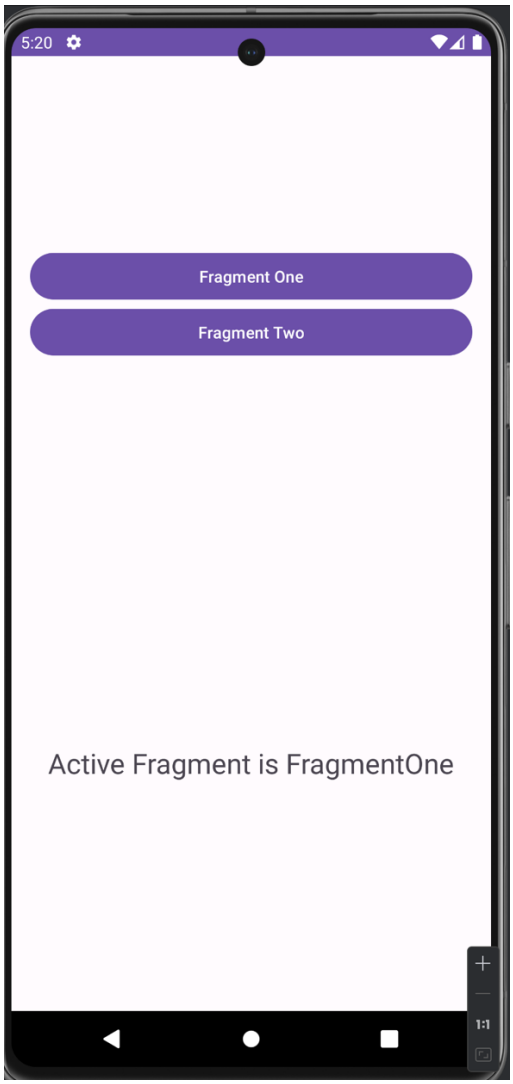
```
package com.example.fragmemtandroid;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import androidx.fragment.app.Fragment;
public class FragmentOne extends Fragment {
    public FragmentOne() {
    }
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        return inflater.inflate(R.layout.fragment_one, container, false);
    }
}
```

FragmentTwo.java

```
package com.example.fragmemtandroid;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import androidx.fragment.app.Fragment;
public class FragmentTwo extends Fragment {
    public FragmentTwo() {
    }
    @Override
```

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

Output



Result

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

Experiment No. 16

Aim:

Implement Navigation drawer.

CO4:

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

Procedure:

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.drawerlayout.widget.DrawerLayout
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:id="@+id/drawerLayout"
   tools:context=".MainActivity">
   <androidx.appcompat.widget.Toolbar
      android:id="@+id/toolbar"
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      app:popupTheme="@style/ThemeOverlay.AppCompat.Light"
      />
  <LinearLayout
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:orientation="horizontal"
  >
  </LinearLayout>
   <com.google.android.material.navigation.NavigationView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_gravity="start"
     app:menu="@menu/navigation_menu"/>
</androidx.drawerlayout.widget.DrawerLayout>
```

Navigation_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
   <item
      android:id="@+id/ac"
      android:title="My Account"
      android:icon="@drawable/ic_baseline_account_circle_24"
      />
   <item
      android:id="@+id/lc"
      android:title="Location"
      android:icon="@drawable/ic_baseline_location_on_24"
      />
</menu>
```

Strings.xml

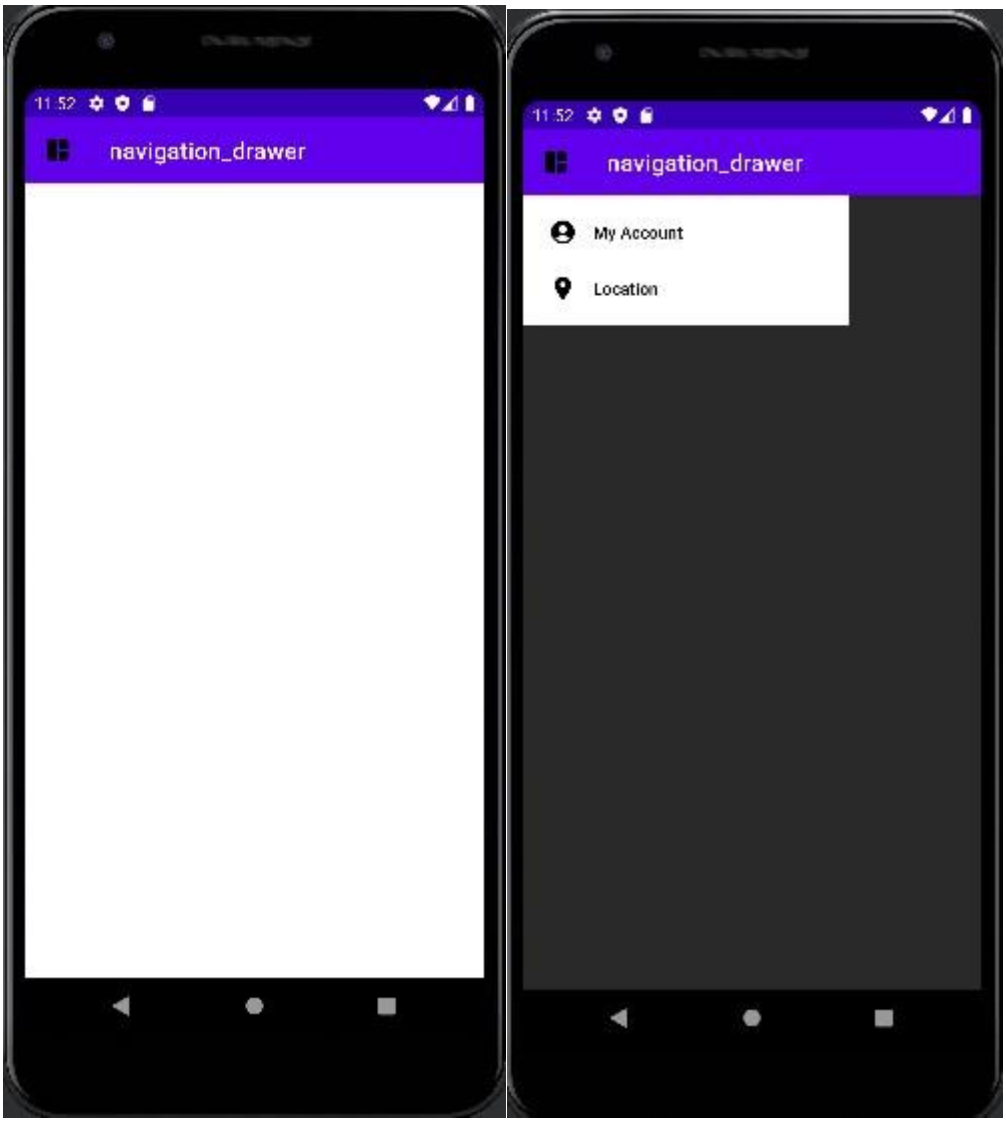
```
<resources>
   <string name="app_name">navigation_drawer</string>
   <string name="nav_open">Open</string>
   <string name="nav_close">Close</string>
</resources>
```

MainActivity.java

```
package com.example.navigation_drawer;
import androidx.annotation.NonNull;
import androidx.appcompat.app.ActionBarDrawerToggle;
import androidx.appcompat.app.AppCompatActivity;
import androidx.appcompat.widget.Toolbar;
import androidx.drawerlayout.widget.DrawerLayout;
import android.os.Bundle;
import android.view.MenuItem;
public class MainActivity extends AppCompatActivity {
DrawerLayout dd;
ActionBarDrawerToggle tt;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      dd=findViewById(R.id.drawerLayout);
      tt=new ActionBarDrawerToggle(this,dd,R.string.nav_open,R.string.nav_open);
      dd.addDrawerListener(tt);
      tt.syncState();
```

```
        getSupportActionBar().setDisplayHomeAsUpEnabled(true);
        getSupportActionBar().setHomeAsUpIndicator(R.drawable.ic_baseline_auto_awesome_mo
saic_24);
    }
    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        if(tt.onOptionsItemSelected(item))
        {
            return true;
        }
        return super.onOptionsItemSelected(item);
    }
}
```

Output



Result

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

Experiment No.17

Aim:

Create database using SQLite and perform INSERT and SELECT.

CO5:

Develop mobile applications using SQLite.

Procedure:

Dbhelper.java

```
package com.example.employeedb;
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, "employee", null, 1);
    }
    @Override
    public void onCreate(SQLiteDatabase s) {
      s.execSQL("create table tbl_employee(empid integer primary key autoincrement,name
varchar(10),department varchar(10),phone varchar(10))");
    }
    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {
    }
}
```

activity_main.xml

```
<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">



  <EditText
     android:id="@+id/Name"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:hint="Name"
```

```
    <EditText
        android:id="@+id/RollNo"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Roll Number"
        android:inputType="number" />

    <EditText
        android:id="@+id/Address"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Address"
        android:inputType="text" />
    <Button
        android:id="@+id/Insert"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Insert"
        android:onClick="insertdb"/>

    <Button
        android:id="@+id/Update"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Update"
        android:onClick="updatedb"/>


    <Button
        android:id="@+id/Delete"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Delete"
        android:onClick="deletedb"/>


    <Button
        android:id="@+id/btnRead"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="View"
        android:onClick="viewdb"/>

</LinearLayout>
```

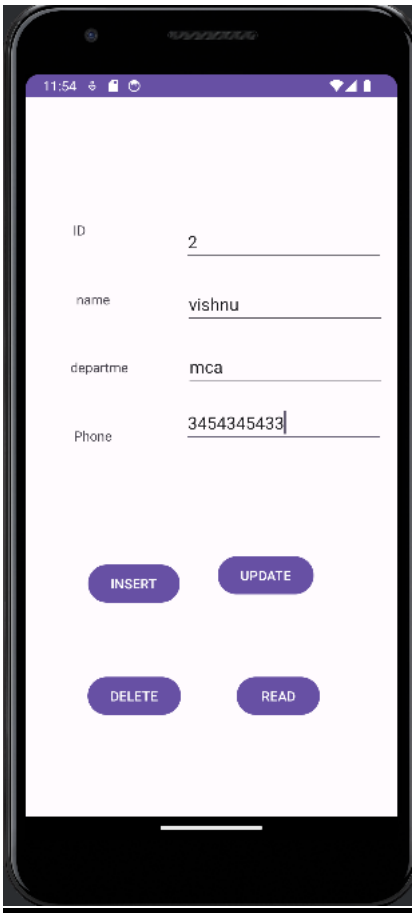
MainActivityjava

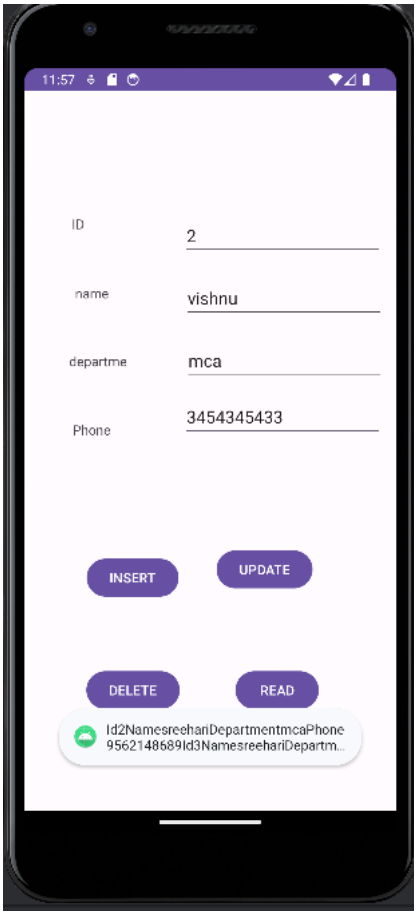
```
package com.example.crud;

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.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
   DbHelper helper=new DbHelper(this);
   SQLiteDatabase db;
   EditText sname,srollno,saddress;

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

      db=helper.getReadableDatabase();
      db=helper.getWritableDatabase();
      sname=findViewById(R.id.Name);
      srollno=findViewById(R.id.RollNo);
      saddress=findViewById(R.id.Address);


   }

   public void insertdb(View view) {
      String n=sname.getText().toString();
      String r=srollno.getText().toString();
      String a=saddress.getText().toString();
      if(n.equals("")||r.equals("")|| a.equals("")){
         Toast.makeText(this, "please enter the data", Toast.LENGTH_SHORT).show();
      }
      else {
      ContentValues data=new ContentValues();
      data.put("name",n);
      data.put("rollno",r);
      data.put("address",a);
      db.insert("stud",null,data);
      Toast.makeText(this, "Inserted...", Toast.LENGTH_SHORT).show();

   }}



else {
         ContentValues data = new ContentValues();
         data.put("name", n);
         data.put("rollno", r);
         data.put("address", a);
         db.update("stud",data,"rollno="+r,null)
   public void viewdb(View view) {
      StringBuffer buffer=new StringBuffer();
```

```
 Cursor c=db.rawQuery("select * from stud",null);
      while(c.moveToNext()){
         buffer.append("ID:"+c.getString(0)+"\t");
         buffer.append("Name"+c.getString(1)+"\t");
         buffer.append("Address"+c.getString(2)+"\t");
      }
      Toast.makeText(this,buffer.toString(),Toast.LENGTH_LONG).show();
   }
}
```

Output





Result

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

Experiment No. 18

Aim:

Perform UPDATE and DELETE on SQLite database.

CO5:

Develop mobile applications using SQLite.

Procedure:

Dbhelper.java

```
package com.example.employeedb;
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, "employee", null, 1);
    }
    @Override
    public void onCreate(SQLiteDatabase s) {
      s.execSQL("create table tbl_employee(empid integer primary key autoincrement,name
varchar(10),department varchar(10),phone varchar(10))");
    }
    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {
    }
}
```

activity_main.xml

```
<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">


  <EditText
     android:id="@+id/Name"
     android:layout_width="match_parent"
```

```
    android:hint="Name"
    android:inputType="text" />

  <EditText
    android:id="@+id/RollNo"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Roll Number"
    android:inputType="number" />

  <EditText
    android:id="@+id/Address"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Address"
    android:inputType="text" />
  <Button
    android:id="@+id/Insert"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Insert"
    android:onClick="insertdb"/>

  <Button
    android:id="@+id/Update"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Update"
    android:onClick="updatedb"/>


  <Button
    android:id="@+id/Delete"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Delete"
    android:onClick="deletedb"/>


  <Button
    android:id="@+id/btnRead"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="View"
    android:onClick="viewdb"/>

</LinearLayout>
```

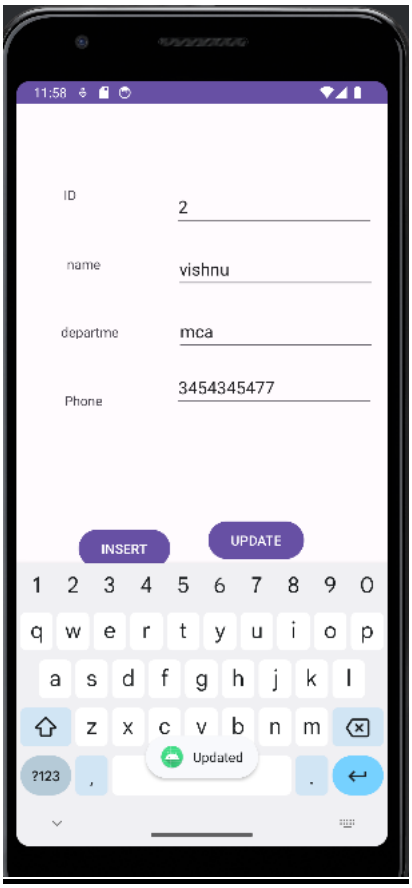
MainActivityjava

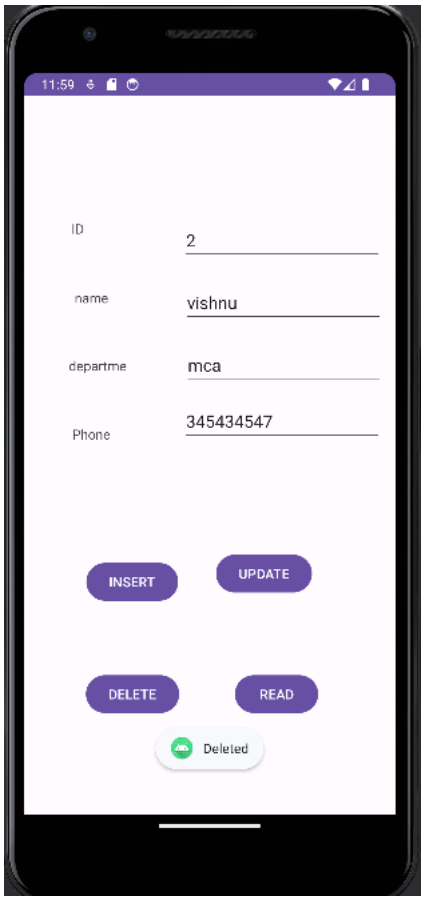
```
package com.example.crud;
```

```
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.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    DbHelper helper=new DbHelper(this);
    SQLiteDatabase db;
    EditText sname,srollno,saddress;

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

        db=helper.getReadableDatabase();
        db=helper.getWritableDatabase();
        sname=findViewById(R.id.Name);
        srollno=findViewById(R.id.RollNo);
        saddress=findViewById(R.id.Address);


    }


    public void updatedb(View view) {

        String n=sname.getText().toString();
        String r=srollno.getText().toString();
        String a=saddress.getText().toString();
        if(n.equals("")||r.equals("")|| a.equals("")){
            Toast.makeText(this, "please enter the data", Toast.LENGTH_SHORT).show();

 }

else {
            ContentValues data = new ContentValues();
            data.put("name", n);            data.put("rollno", r);
            data.put("address", a);
            db.update("stud",data,"rollno="+r,null);
            Toast.makeText(this, "Updated...", Toast.LENGTH_SHORT).show();
        }

    }

    public void deletedb(View view) {
        String r=srollno.getText().toString();
```

```
if(r.equals("")){
        Toast.makeText(this, "please enter the data", Toast.LENGTH_SHORT).show();
    }
    else {
        ContentValues data = new ContentValues();
        data.put("rollno", r);
        db.delete("stud","rollno="+r,null);
        Toast.makeText(this, "Deleted...", Toast.LENGTH_SHORT).show();
    }


}
```

Output





Result

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