

20MCA243 – Mobile Application Development Lab

Lab Report Submitted By

SIDDHARTH DILEEP

AJC22MCA-2082

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 **SIDDHARTH DILEEP (AJC22MCA-2082)** 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**.

Ms. Ankitha Philip
Lab In-Charge

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

Internal Examiner

External Examiner

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

VISION

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

MISSION

- MS1 - Provide foundations and advanced technical education in both theoretical and applied Computer Applications in-line with Industry demands.
- MS2 - Create highly skilled computer professionals capable of designing and innovating real life solutions.
- MS3 - Sustain an academic environment conducive to research and teaching focused to generate up-skilled professionals with ethical values.
- MS4 - Promote entrepreneurial initiatives and innovations capable of bridging and contributing with sustainable, socially relevant technology solutions.

COURSE OUTCOME

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

COURSE END SURVEY

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

CONTENT

Sl. No.	Experiment	Date	CO	Page No.
1	Design a Login Form with username and password using LinearLayout and toast valid credentials.	24-08-2023	CO1	1
2	Write a program that demonstrates Activity Lifecycle.	07-09-2023	CO1	4
3	Implementing basic arithmetic operations of a simple calculator.	14-09-2023	CO1	8
4	Implement validations on various UI controls.	21-09-2023	CO1	14
5	Design a registration activity and store registration details in local memory of phone using Intents and Shared Preferences.	28-09-2023	CO2	21
6	Create a Facebook page using RelativeLayout; set properties using .xml file.	05-10-2023	CO2	25
7	Develop an application that toggles image using FrameLayout.	05-10-2023	CO2	31
8	Implement Adapters and perform exception handling.	12-10-2023	CO3	34
9	Implement Intent to navigate between multiple activities.	18-10-2023	CO3	36

Sl. No.	Experiment	Date	CO	Page No.
10	Develop application that works with explicit intents.	18-10-2023	CO3	39
11	Implement Options Menu to navigate to activities.	25-10-2023	CO3	42
12	Develop an application that uses ArrayAdapter with ListView.	25-10-2023	CO3	45
13	Develop an application that use GridView with images and display Alert box on selection.	25-10-2023	C04	48
14	Develop an application that implements Spinner component and perform event handling.	25-10-2023	C04	51
15	Develop application using Fragments.	09-11-2023	C04	54
16	Implement Navigation drawer.	09-11-2023	C04	57
17	Create database using SQLite and perform INSERT and SELECT.	16-11-2023	C05	62
18	Perform UPDATE and DELETE on SQLite database.	16-11-2023	C05	68

Experiment No.: 1

Aim

Design a login form with username and password using linear layout and toast valid credentials.

CO1

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

Procedure

MainActivity.java

```
package com.example.reg_form_constraint;

import androidx.appcompat.app.AppCompatActivity;

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 {
    private EditText name,username,email,phone,password;
    private Button submit;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        name=findViewById(R.id.name);
        username=findViewById(R.id.username);
        password=findViewById(R.id.password);
        email=findViewById(R.id.email);
        phone=findViewById(R.id.phone);
        submit=findViewById(R.id.submit);
        submit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String ename=name.getText().toString();
                String eusername=username.getText().toString();
                String epassword=password.getText().toString();
                String eemail=email.getText().toString();
                String ephone=phone.getText().toString();
                String message = "Your name is: " + ename + "\n"
                + "Your Username is: " + eusername + "\n"
                + "Your Password is: " + epassword + "\n"
                + "Your Email is: " + eemail + "\n"
                + "Your Number is: " + ephone;
```

```
Toast.makeText(MainActivity.this,message, Toast.LENGTH_SHORT).show();
}
});
}
```

Activity_main.xml

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

    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="name"
    />
    <EditText
        android:id="@+id/username"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="username"
    />
    <EditText
        android:id="@+id/password"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Password"
    />
    <EditText
        android:id="@+id/email"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="email"
    />
    <EditText
        android:id="@+id/phone"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="phone number"
    />
    <Button
        android:id="@+id/submit"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" android:text="submit"></LinearLayout>
```

Output



Result

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

Experiment No.: 2**Aim**

Write a program
m that demonstrates Activity Lifecycle.

CO1

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

Procedure**MainActivity.java**

```
package com.example.exp3;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast.makeText(MainActivity.this,"Created",Toast.LENGTH_LONG).show();
    }

    @Override
    protected void onStart() {
        super.onStart();
        Toast.makeText(MainActivity.this,"Start",Toast.LENGTH_LONG).show();
    }

    @Override
    protected void onResume() {
        super.onResume();
        Toast.makeText(MainActivity.this,"Resume",Toast.LENGTH_LONG).show();
    }
}
```

```
@Override
protected void onPause() {
    super.onPause();
    Toast.makeText(MainActivity.this,"Pause",Toast.LENGTH_LONG).show();
}

@Override
protected void onStop() {
    super.onStop();
    Toast.makeText(MainActivity.this,"Stop",Toast.LENGTH_LONG).show();
}

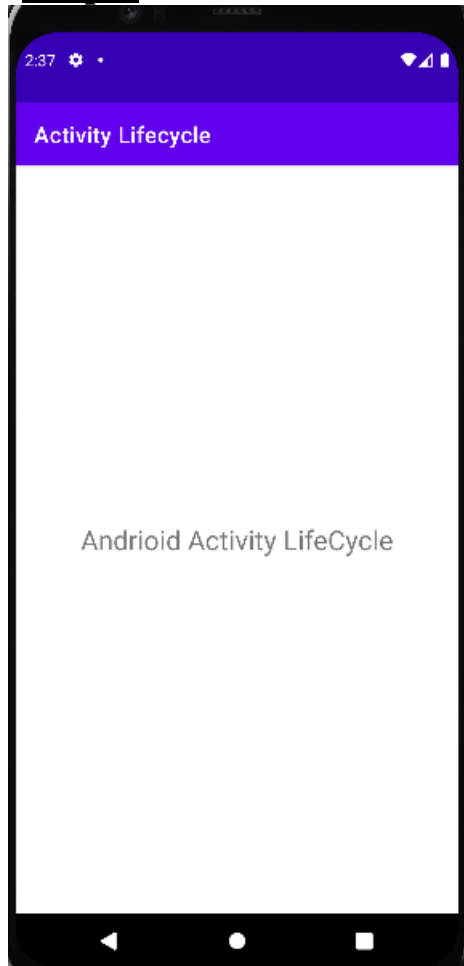
@Override
protected void onRestart() {
    super.onRestart();
    Toast.makeText(MainActivity.this,"Restart",Toast.LENGTH_LONG).show();
}

@Override
protected void onDestroy() {
    super.onDestroy();
    Toast.makeText(MainActivity.this,"Destroy",Toast.LENGTH_LONG).show();
}
}
```

Activity_main.xml

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

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

Output**Result**

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

Experiment No.: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.calc;

```
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;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    Button add, subtract, multiply, divide;
    EditText e1, e2;
    TextView txtv1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = findViewById(R.id.t1);
        e2 = findViewById(R.id.t2);
        txtv1 = findViewById(R.id.resid);
        add = findViewById(R.id.add);
        subtract = findViewById(R.id.subtract);
        multiply = findViewById(R.id.multiply);
        divide = findViewById(R.id.divide);

        add.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                performOperation("+");
            }
        });

        subtract.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                performOperation("-");
            }
        });

        multiply.setOnClickListener(new View.OnClickListener() {
```

```
@Override
public void onClick(View view) {
performOperation("*");
}
});

divide.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View view) {
performOperation("/");
}
});

private void performOperation(String operator) {
String val1 = e1.getText().toString();
String val2 = e2.getText().toString();

if (val1.isEmpty() || val2.isEmpty()) {
txtv1.setText("Enter Both Nos.");
return;
}

double a = Double.parseDouble(val1);
double b = Double.parseDouble(val2);
double result = 0;

if (operator.equals("+")) {
result = a + b;
} else if (operator.equals("-")) {
result = a - b;
} else if (operator.equals("*")) {
result = a * b;
} else if (operator.equals("/")) {
if (b != 0) {
result = a / b;
} else {
Toast.makeText(MainActivity.this, "Division by zero is not allowed", Toast.LENGTH_SHORT).show();
return;
}
}

String c = String.valueOf(result);
txtv1.setText("Result: " + c);
}
}
```

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_height="wrap_content" android:layout_width="wrap_content">
        <TextView
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:text="@string/no1"
        />
        <EditText
            android:id="@+id/t1"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:inputType="number" />
    </TableRow>

    <TableRow android:layout_height="wrap_content" android:layout_width="wrap_content">
        <TextView
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:text="@string/no2"
        />
        <EditText
            android:id="@+id/t2"
            android:layout_height="wrap_content"
            android:layout_width="wrap_content"
            android:inputType="number" />
    </TableRow>

    <TableRow android:layout_height="wrap_content" android:layout_width="wrap_content">
        <Button
            android:id="@+id/add"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Add" />
        <Button
            android:id="@+id/subtract"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Subtract" />
    </TableRow>

    <TableRow android:layout_height="wrap_content" android:layout_width="wrap_content">
        <Button
```

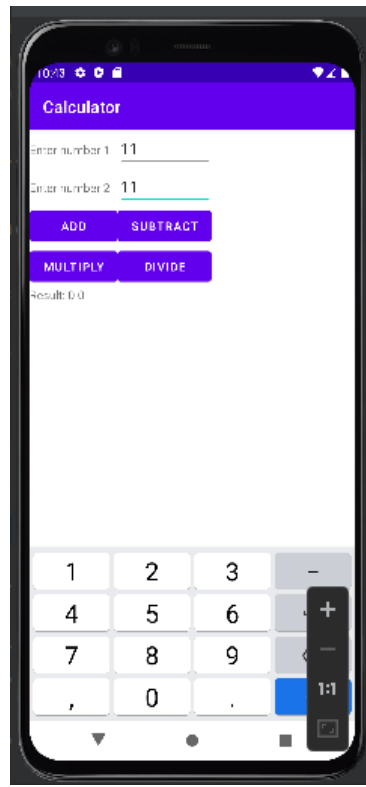
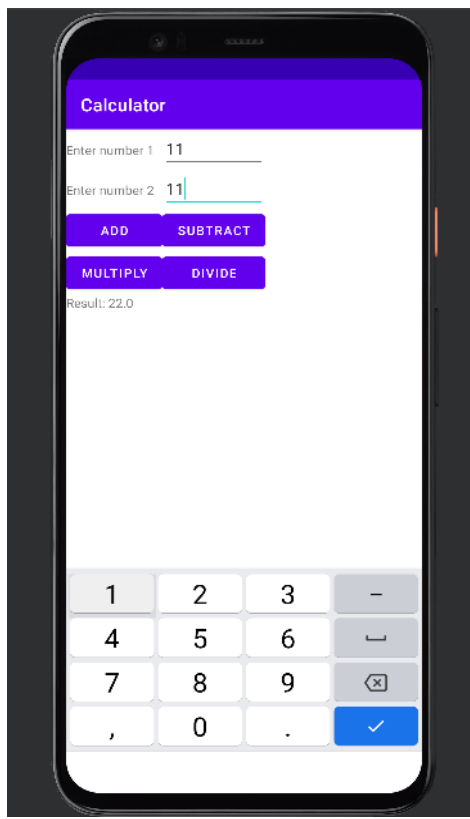
```
android:id="@+id/multiply"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Multiply" />
<Button
android:id="@+id/divide"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Divide" />
</TableRow>

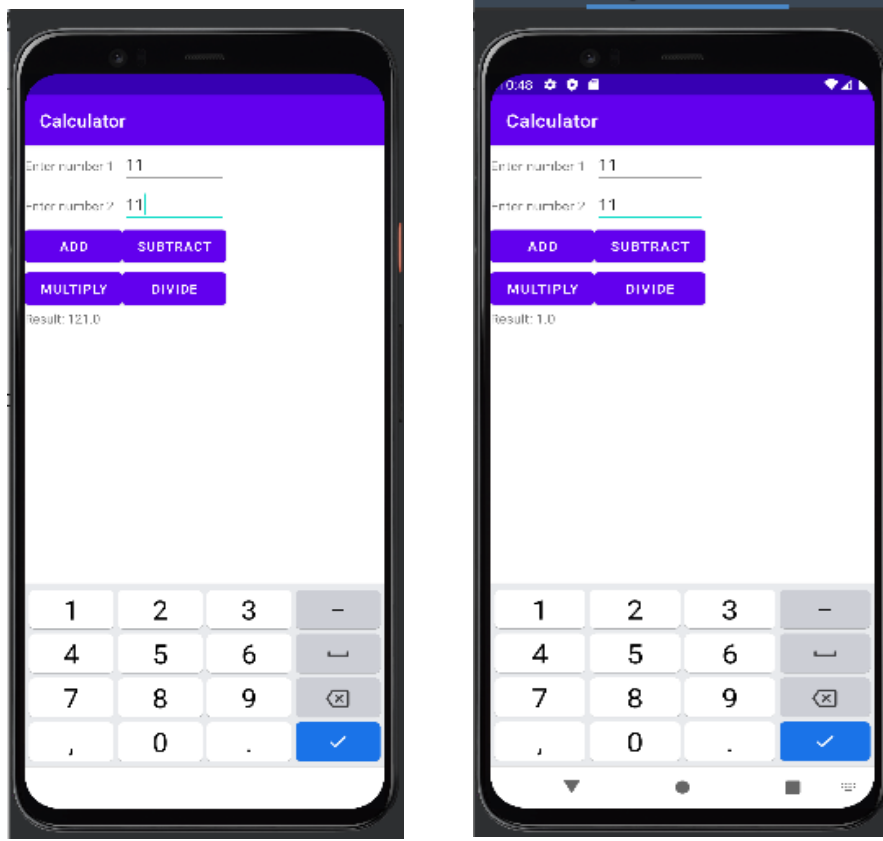
<TableRow android:layout_height="wrap_content" android:layout_width="wrap_content">
<TextView
android:id="@+id/resid"
android:layout_height="wrap_content"
android:layout_width="wrap_content"
android:text="@string/no3" />
</TableRow>
</TableLayout>
```

Strings

```
<resources>
<string name="app_name">Calculator</string>
<string name="t1">Enter number 1</string>
<string name="t2">Enter number 2</string>
<string name="b1">Calculate</string>
<string name="no1">Enter number 1</string>
<string name="no2">Enter number 2</string>
<string name="no3">Result</string>
<string name="resid">Result: %s</string>
</resources>
```


Output





Result

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

Experiment No.: 4

Aim

Implement validations on various UI controls.

CO1

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

Procedure

MainActivity.java

```
package com.example.registration;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import com.google.android.material.textfield.TextInputLayout; import java.util.regex.Pattern;
public class MainActivity extends AppCompatActivity {
    TextInputLayout Username,Email,Mobile>Password;
    private static final Pattern PASSWORD_PATTERN =
        Pattern.compile("^" +
            "(?=.*[0-9])" + //at least 1 digit  "(?=.*[a-z])" + //at least 1 lower case letter  "(?=.*[A-Z])" + //at
            least 1 upper case letter  "(?=.*[a-zA-Z])" + //any letter
            "(?=.*[@#$%^&+=])" + //at least 1 special character  "(?=\S+$)" + //no white spaces
            ".{4,}" + //at least 4 characters  "$");
    // Pattern.compile("^" +
    // "(?=.*[0-9])" + // at least 1 digit
    // "(?=.*[a-z])" + // at least 1 lower case letter
    // "(?=.*[A-Z])" + // at least 1 upper case letter
    // "(?=.*[a-zA-Z])" + // any letter
    // "(?=.*[@#$%^&+=])" + // at least 1 special character
    // "(?=\S+$)" + // no white spaces
    // ".{4,}" + // at least 4 characters
    // "$");
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Username=findViewById(R.id.inputLayout_username);

        Mobile=findViewById(R.id.inputLayout_mobile);
        Password=findViewById(R.id.inputLayout_password); }
    public void Validate(View view){
```

```
Mobile=findViewById(R.id.inputLayout_mobile);
Password=findViewById(R.id.inputLayout_password); }
public void Validate(View view){
if (!validatePhoneNumber() | !validateUsername() | !validateEmail() | !validatePassword()) {
return;
}
}
private boolean validateUsername() {
String val = Username.getText().getText().toString().trim(); String checkspaces = "^[A-Za-z][A-Za-z0-9_]{1,20}$";
if (val.isEmpty()) {
Username.setError("Field can not be empty");
return false;
} else if (val.length() > 20) {
Username.setError("Username is too large!");
return false;
} else if (!val.matches(checkspaces)) {
Username.setError("No White spaces are allowed!"); return false;
} else {
Username.setError(null);
Username.setErrorEnabled(false);
return true;
}
}
private boolean validateEmail() {
String val = Email.getText().getText().toString().trim(); String checkEmail = "[a-zA-Z0-9._-]+@[a-z]+.[a-z]+";
if (val.isEmpty()) {
Email.setError("Field can not be empty");
return false;
} else if (!val.matches(checkEmail)) {
Email.setError("Invalid Email");
return false;
} else {
Email.setError(null);
Email.setErrorEnabled(false); return true;
}
```

```
}  
}  
private boolean validatePhoneNumber() {  
    String val = Mobile.getEditText().getText().toString().trim(); String MobilePattern = "[0-9]{10}";  
    if (val.isEmpty()) {  
        Mobile.setError("Must be 10 digits"); return false;  
    } else if (!val.matches(MobilePattern)) {  
        Mobile.setError("No White spaces are allowed!"); return false;  
    } else {  
        Mobile.setError(null);  
        Mobile.setErrorEnabled(false);  
        return true;  
    }  
}  
private boolean validatePassword() {  
    String passwordInput =  
    Password.getEditText().getText().toString().trim();  
  
    if (passwordInput.isEmpty()) {  
        Password.setError("Field can not be empty"); return false;  
    }  
    // if password does not matches to the pattern  
    // it will display an error message "Password is too weak"  
    else if (!PASSWORD_PATTERN.matcher(passwordInput).matches()) {  
        Password.setError("Password is too weak");  
        return false;  
    } else {  
        Password.setError(null); return true;  
    }  
}  
}
```

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_height="match_parent"
tools:context=".MainActivity">
<androidx.constraintlayout.widget.Guideline
android:id="@+id/guideline"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:orientation="horizontal"
app:layout_constraintGuide_percent=".15" />
<com.google.android.material.textview.MaterialTextView
android:id="@+id/textView_loginTitle"
style="@style/TextAppearance.MaterialComponents.Headline4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:fontFamily="@font/dancing_script_bold"
android:text="@string/text_login"
app:fontFamily="@font/dancing_script_bold"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="@+id/guideline" />
<com.google.android.material.textfield.TextInputLayout
android:id="@+id/inputLayout_username"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="32dp"
app:endIconMode="clear_text"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView_loginTitle"
app:startIconDrawable="@drawable/ic_baseline_supervised_user_circle_24">
<com.google.android.material.textfield.TextInputEditText
android:id="@+id/inputEditText_username"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="text"
android:hint="@string/text_username"
android:nextFocusForward="@id/inputEditText_mobile" android:singleLine="true" />
</com.google.android.material.textfield.TextInputLayout>
<com.google.android.material.textfield.TextInputLayout
android:id="@+id/inputLayout_OutlinedBox"
```

```

android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="32dp"
app:endIconMode="clear_text"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/inputLayout_username"
app:startIconDrawable="@drawable/ic_baseline_phone_android_24">
<com.google.android.material.textfield.TextInputEditText
android:id="@+id/inputEditText_mobile"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="number"
android:hint="@string/text_Contact"
android:nextFocusForward="@id/inputLayout_email" android:singleLine="true" />
</com.google.android.material.textfield.TextInputLayout>
<com.google.android.material.textfield.TextInputLayout android:id="@+id/inputLayout_email"

```

```

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="32dp"
app:endIconMode="clear_text"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/inputLayout_mobile"
app:startIconDrawable="@drawable/ic_baseline_email_24">
<com.google.android.material.textfield.TextInputEditText
android:id="@+id/inputEditText_email"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="@string/text_email"
android:inputType="textEmailAddress"
android:nextFocusForward="@id/inputLayout_password" android:singleLine="true" />
</com.google.android.material.textfield.TextInputLayout>
<com.google.android.material.textfield.TextInputLayout
android:id="@+id/inputLayout_password"

```

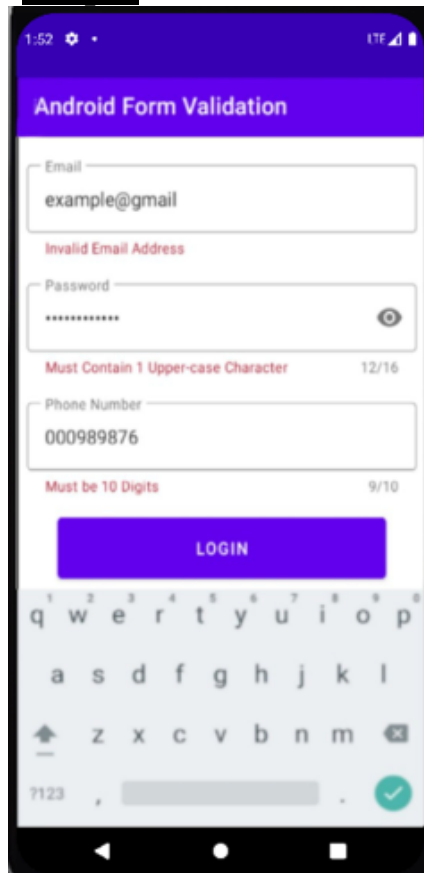
```

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
android:layout_width="match_parent"
android:layout_height="wrap_content" android:layout_margin="32dp"

```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/inputLayout_email"
app:startIconDrawable="@drawable/ic_baseline_lock_24">
<com.google.android.material.textfield.TextInputEditText
android:id="@+id/inputEditText_password"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="@string/text_password"
android:imeOptions="actionDone"
android:inputType="textPassword"
android:singleLine="true" />
</com.google.android.material.textfield.TextInputLayout>
<com.google.android.material.button.MaterialButton
android:id="@+id/button_login"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="32dp"
android:insetTop="0dp"
android:insetBottom="0dp"
android:text="@string/text_button_login"
android:textAllCaps="false"
android:onClick="Validate"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/inputLayout_password" />
</androidx.constraintlayout.widget.ConstraintLayout>
```


Output



Result

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

Experiment No.: 5**Aim**

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

CO2

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

Procedure**MainActivity.java**

```
package com.example.intent;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    private EditText usernameEditText, passwordEditText; private Button
    registerButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        usernameEditText = findViewById(R.id.usernameEditText);
        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 password = passwordEditText.getText().toString();
        SharedPreferences preferences = getSharedPreferences("MyPrefs",MODE_PRIVATE);
        SharedPreferences.Editor editor = preferences.edit();
        editor.putString("username", username);
        editor.putString("password", password);
        editor.apply();

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

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

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
```

```
android:gravity="center">
```

```
<EditText
```

```
    android:id="@+id/usernameEditText"
```

```
    android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
```

```
    android:hint="Username"
```

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

```
<EditText
```

```
    android:id="@+id/passwordEditText"
```

```
    android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
```

```
    android:hint="Password"
```

```
    android:inputType="textPassword" />
```

```
<Button
```

```
    android:id="@+id/registerButton"
```

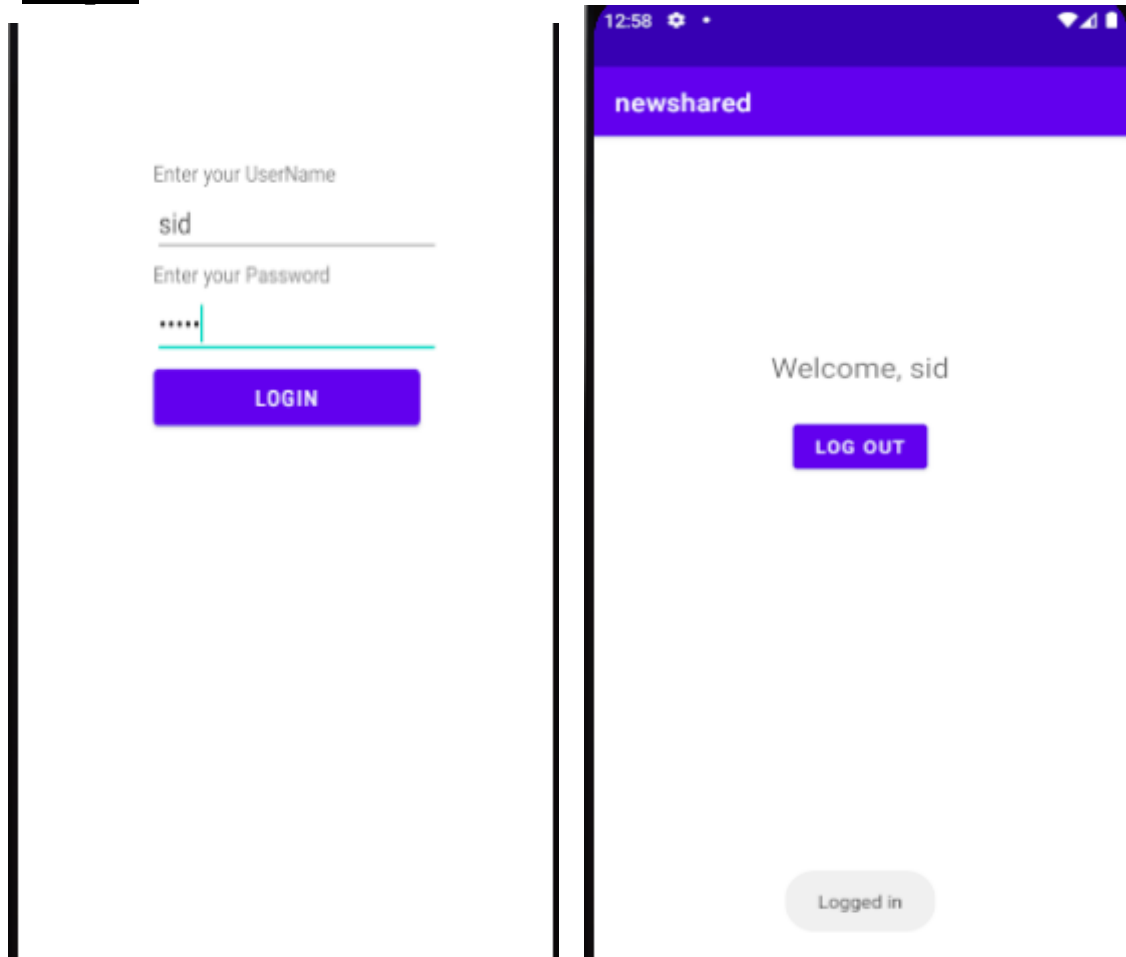
```
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
```

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

```
</LinearLayout>
```

Output



Result

The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

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**MainActivity.java**

```
package com.example.facebook;

import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;
import android.widget.Toast;

public class MainActivity extends Activity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ImageView facebookView = findViewById(R.id.facebookView );
        ImageView likeImageView = findViewById(R.id.likeImageView);
        ImageView commentImageView = findViewById(R.id.commentImageView);
        ImageView shareImageView = findViewById(R.id.shareImageView);

        // Set click listeners for the ImageViews
        likeImageView.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```
        showToast("You clicked the Like button");
    }
});

commentImageView.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        showToast("You clicked the Comment button");
    }
});

shareImageView.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        showToast("You clicked the Share button");
    }
});
}

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

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:paddingLeft="16dp"
    android:paddingRight="16dp" >
    <ScrollView
        android:layout_width="match_parent"
```

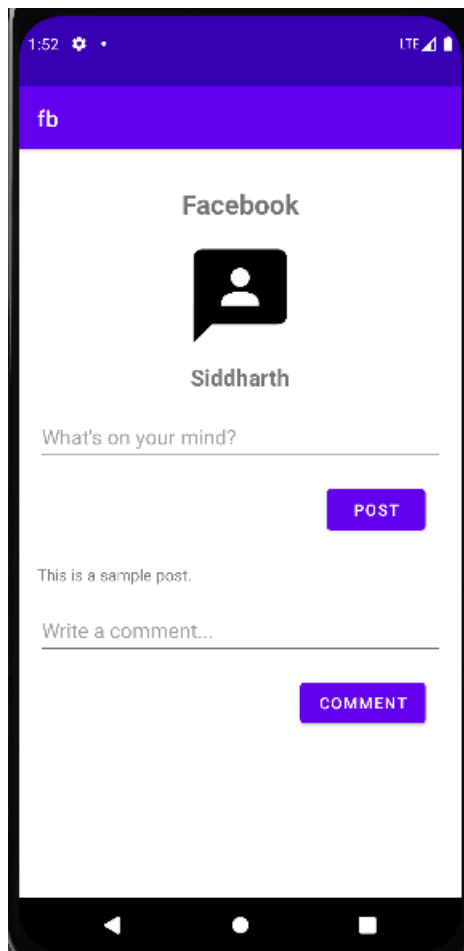
```
android:layout_height="match_parent">
<LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:orientation="vertical">
    <ImageView
        android:id="@+id/facebookView"
        android:layout_width="200dp"
        android:layout_height="80dp"
        android:layout_gravity="center"
        android:src="@drawable/facebook" />
    <ImageView
        android:id="@+id/imageView4"
        android:layout_width="match_parent"
        android:layout_height="281dp"
        android:src="@drawable/img_3" />
    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="40dp"
        android:columnCount="4"
        android:rowCount="4">
        <ImageView
            android:id="@+id/likeImageView"
            android:layout_width="110dp"
            android:layout_height="83dp"
            android:layout_gravity="center"
            android:clickable="true"
            android:onClick="onLikeClick"
            android:src="@drawable/img" />
```

```
<ImageView
    android:id="@+id/commentImageView"
    android:layout_width="111dp"
    android:layout_height="66dp"
    android:layout_row="0"
    android:layout_column="1"
    android:layout_gravity="center"
    android:clickable="true"
    android:onClick="onCommentClick"
    android:src="@drawable/img_1" />
<ImageView
    android:id="@+id/shareImageView"
    android:layout_width="93dp"
    android:layout_height="86dp"
    android:layout_row="0"
    android:layout_column="3"
    android:layout_gravity="center"
    android:clickable="true"
    android:onClick="onShareClick"
    android:src="@drawable/img_4" />
</GridLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical">
    <ImageView
        android:id="@+id/imageView7"
        android:layout_width="match_parent"
        android:layout_height="281dp"
        android:src="@drawable/img_5" />
    <GridLayout
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:layout_marginTop="40dp"
        android:columnCount="4"
        android:rowCount="4">
    <ImageView
        android:id="@+id/likeImageView2"
        android:layout_width="110dp"
        android:layout_height="83dp"
        android:layout_gravity="center"
        android:clickable="true"
        android:onClick="onLikeClick"
        android:src="@drawable/img" />
    <ImageView
        android:id="@+id/commentImageView2"
        android:layout_width="111dp"
        android:layout_height="66dp"
        android:layout_row="0"
        android:layout_column="1"
        android:layout_gravity="center"
        android:clickable="true"
        android:onClick="onCommentClick"
        android:src="@drawable/img_1" />
    <ImageView
        android:id="@+id/shareImageView2"
        android:layout_width="93dp"
        android:layout_height="86dp"
        android:layout_row="0"
        android:layout_column="3"
        android:layout_gravity="center"
```

```
        android:clickable="true"
        android:onClick="onShareClick"
        android:src="@drawable/img_4" />
    </GridLayout>
</LinearLayout>
</LinearLayout>
</ScrollView>
</RelativeLayout>
```

Output



Result

The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

Experiment No.: 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**MainActivity.java**

```
package com.example.s_frames;

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

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
    ImageView i1,i2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        i1=(ImageView) findViewById(R.id.imageView1);
        i2=(ImageView) findViewById(R.id.imageView2);
        i1.setOnClickListener(this);
        i2.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        if(v.getId()==R.id.imageView1)
        {
```

```
        i1.setVisibility(v.GONE);
        i2.setVisibility(v.VISIBLE);
    }
    else
    {

        i2.setVisibility(v.GONE);
        i1.setVisibility(v.VISIBLE);
    }
}
}
```

Activity_main.xml

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

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

    <ImageView
        android:id="@+id/imageView2"
```

```
    android:layout_width="396dp"
    android:layout_height="wrap_content"
    android:layout_gravity="left|top"
    android:visibility="gone"
    app:srcCompat="@drawable/img_1" />
</FrameLayout>
```

Output



Result

The program was executed successfully and the output was obtained. Thus, CO2 has been attained.

Experiment No.: 8**Aim**

Implement Adapters and perform exception handling.

CO4

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

Procedure

```
package com.example.excephandle;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;
import java.util.ArrayList;
import java.util.List;

public class MainActivity extends AppCompatActivity {
    List<String> list=new ArrayList<>();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        list.add("ITEM 1");
        list.add("ITEM 2");
        list.add("ITEM 3");
        list.add("ITEM 4");
        for (int i=0;i<5;i++) {

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

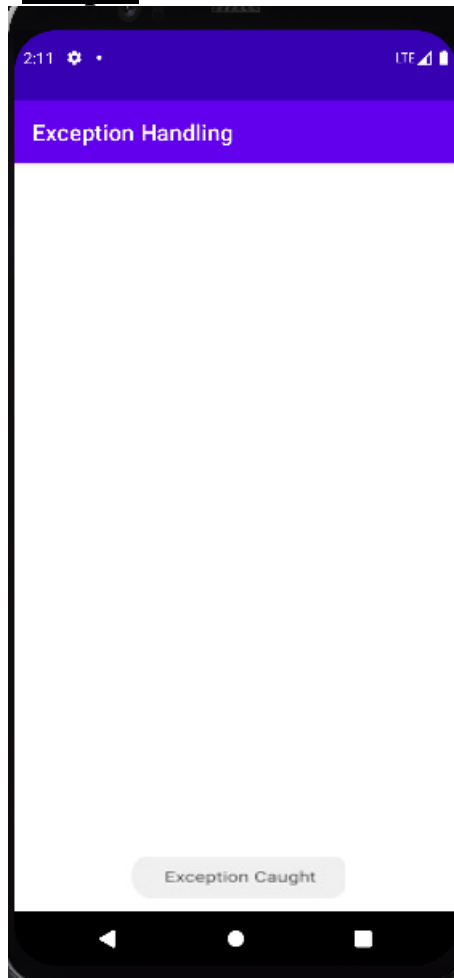
Activity_main.xml

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

```
xmlns:tools="http://schemas.android.com/tools"  
android:layout_width="match_parent"  
android:layout_height="match_parent"  
tools:context=".MainActivity">  
<ListView  
    android:id="@+id/t1"  
    android:layout_width="409dp"  
    android:layout_height="368dp"  
    tools:layout_editor_absoluteX="1dp"  
    tools:layout_editor_absoluteY="1dp" />
```

```
</RelativeLayout>
```

Output



Result

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

Experiment No.: 9

Aim

Implement Intent to navigate between multiple activities.

CO4

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

Procedure

MainActivity.java

```
package com.example.myapplication10;

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 {
    Button b1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1=findViewById(R.id.b1);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent obj=new Intent(Intent.ACTION_VIEW, Uri.parse("https://www.google.com"));
                startActivity(obj);
            }
        });
    }
}
```

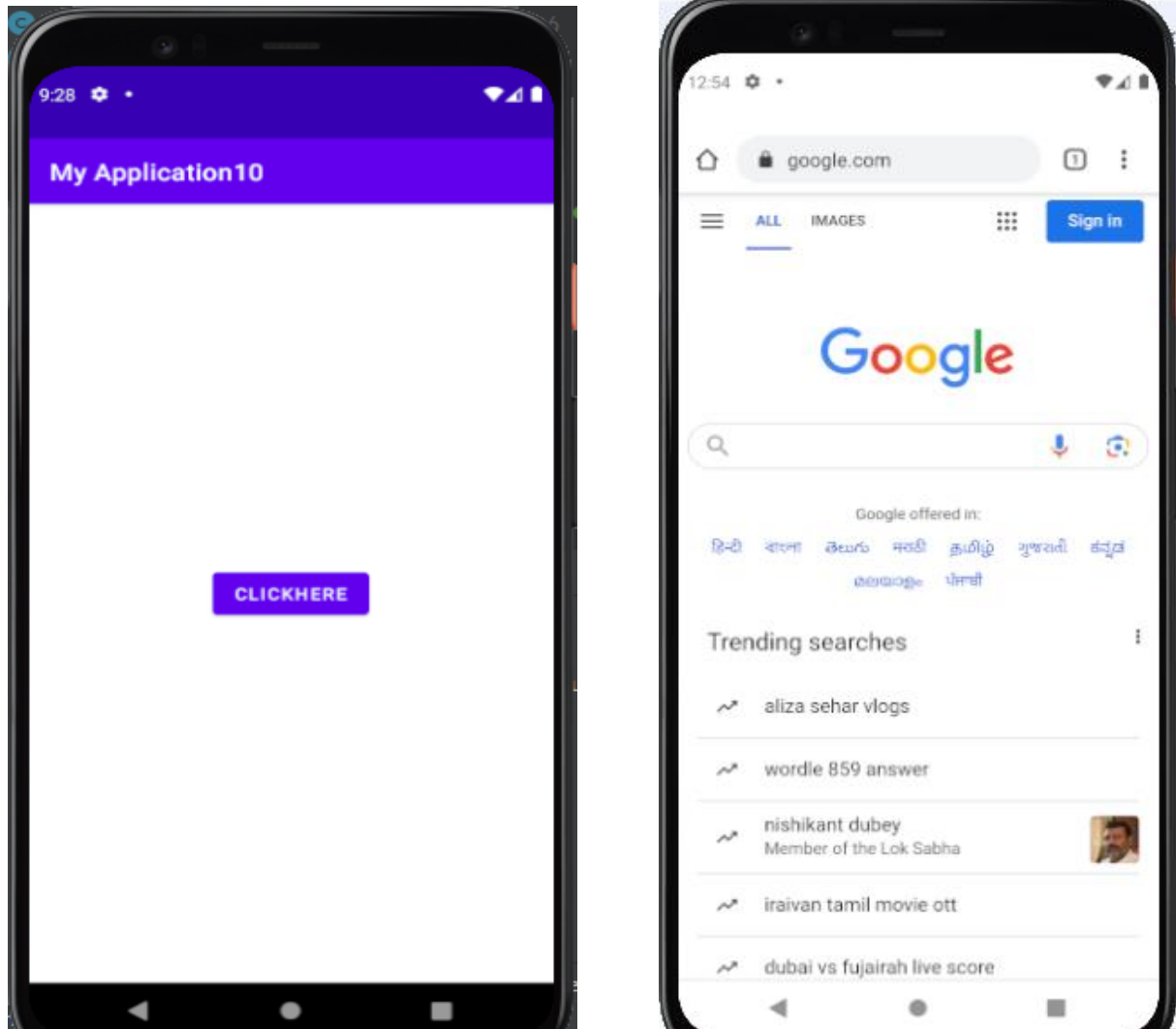
activity_main.xml

```
<?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="horizontal"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="Click me" />

</LinearLayout>
```

Output



Result

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

Experiment No.: 10

Aim

Develop application that works with explicit intents.

CO3

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

Procedure

MainActivity.java

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

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

MainActivity2.java

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

```

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

```

Activity_main.xml

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center">
    <EditText
        android:id="@+id/e"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:inputType="text"
        android:hint="E-mail" />
    <EditText
        android:id="@+id/e1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:inputType="text"
        android:hint="Password" />
    <Button
        android:id="@+id/b1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:onClick="switchActivity"
        android:text="Submit" />
</LinearLayout>

```

Activity_main2.xml

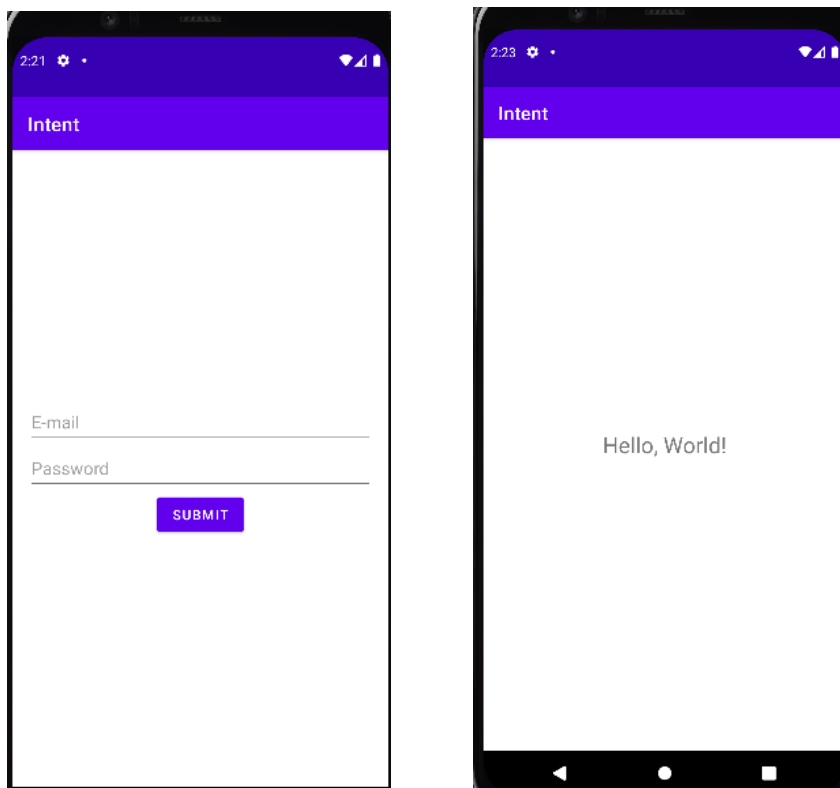
```

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

```

```
android:layout_width="match_parent"
android:layout_height="match_parent"
android:orientation="vertical"
android:padding="16dp"
android:gravity="center">
<TextView
    android:id="@+id/t1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="TextView"
    tools:layout_editor_absoluteX="181dp"
    tools:layout_editor_absoluteY="190dp" />
<TextView
    android:id="@+id/t2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="TextView"
    tools:layout_editor_absoluteX="175dp"
    tools:layout_editor_absoluteY="237dp" /></LinearLayout>
```

Output



Result

The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

Experiment No.: 11

Aim

Implement Options Menu to navigate to activities.

CO3

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

Procedure

MainActivity.java

```
package com.example.optionmenu;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import 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);
    }

    @SuppressWarnings("RestrictedApi")
    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        MenuInflater inflater=getMenuInflater();
        inflater.inflate(R.menu.optionmenu,menu);
        if(menu instanceof MenuBuilder) {
            MenuBuilder m = (MenuBuilder) menu; //to view icon with menu
            m.setOptionalIconsVisible(true);
        }
        return super.onCreateOptionsMenu(menu);
    }

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        Toast.makeText(this, "selected item is "+item.getTitle(), Toast.LENGTH_SHORT).show();
        switch(item.getItemId())
        {
            {

```

```
case R.id.search_id:
    return true;
case R.id.share_id:
    return true;
case R.id.download_id:
    return true;
default:
    return super.onOptionsItemSelected(item); //must
}

}

}
```

Options_Menu.xml

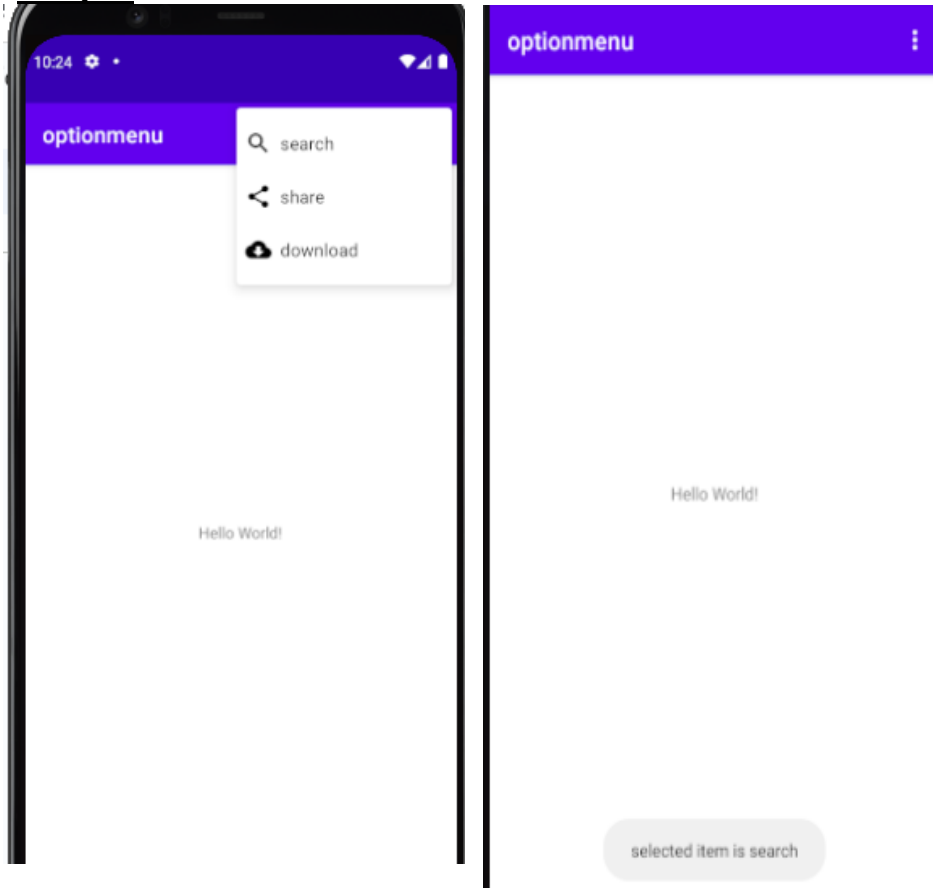
```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">

<item android:id="@+id/search_id"
    android:title="search"
    android:icon="@drawable/search_icon"/>

    <item android:id="@+id/share_id"
        android:title="share"
        android:icon="@drawable/share_icon"/>

    <item android:id="@+id/download_id"
        android:title="download"
        android:icon="@drawable/download_icon"
        />
</menu>
```


Output



Result

The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

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 MainActivity.java package com.example.arradapter;

```
import androidx.appcompat.app.AppCompatActivity;

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 mylistview;
    String courselist[]={
        "java",
        "python",
        "c++"
    };

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        mylistview=(ListView) findViewById(R.id.l1);
        ArrayAdapter<String> arrayAdapter =new ArrayAdapter<String>(this,R.layout.list,R.id.t1,courselist);
        mylistview.setAdapter(arrayAdapter);
        mylistview.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> adapterView, View view, int i, long l) {
                String item=(String)mylistview.getItemAtPosition(i);
                Toast.makeText(MainActivity.this, "Your selected course is "+item,
                Toast.LENGTH_SHORT).show();

            }
        });
    }
}
```

Activity_main.xml

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

    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/l1"
        android:divider="#E91E63"
        android:dividerHeight="2dp"/> />
</RelativeLayout>
```

Lists.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:orientation="vertical"
    android:layout_height="match_parent">

    <TextView
        android:id="@+id/t1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="TextView" />
</LinearLayout>
```

Output



Result

The program was executed successfully and the output was obtained. Thus, CO3 has been attained.

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

MainActivity.java

MainActivity.javapackage com.example.imagegridview;

```
import android.content.Context;
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.Toast;
```

```
import androidx.appcompat.app.AppCompatActivity;
```

```
public class MainActivity extends AppCompatActivity {
```

```
    String[] fruitNames = {"Apple", "Mango", "Cherry", "Lemon"};
    int[] fruitImages = {R.drawable.apple, R.drawable.mango, R.drawable.cherry,
R.drawable.lemon};
```

```
    @Override
```

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

```
        GridView gridView = findViewById(R.id.grid);
        ImageAdapter imageAdapter = new ImageAdapter(this, fruitNames, fruitImages);
        gridView.setAdapter(imageAdapter);
```

```
        gridView.setOnItemClickListener((parent, view, position, id) ->
            Toast.makeText(MainActivity.this, "You've clicked " + fruitNames[position],
Toast.LENGTH_SHORT).show());
    }
```

```
    private static class ImageAdapter extends BaseAdapter {
```

```
private Context mContext;
private String[] mFruitNames;
private int[] mFruitImages;

public ImageAdapter(Context context, String[] fruitNames, int[] fruitImages) {
    mContext = context;
    mFruitNames = fruitNames;
    mFruitImages = fruitImages;
}

@Override
public int getCount() {
    return mFruitImages.length;
}

@Override
public Object getItem(int position) {
    return mFruitImages[position];
}

@Override
public long getItemId(int position) {
    return position;
}

@Override
public View getView(int position, View convertView, ViewGroup parent) {
    ImageView imageView;
    if (convertView == null) {
        imageView = new ImageView(mContext);
        imageView.setLayoutParams(new GridView.LayoutParams(350, 350));
    } else {
        imageView = (ImageView) convertView;
    }
    imageView.setImageResource(mFruitImages[position]);
    return imageView;
}
}
```

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">
```

```
<GridView  
    android:id="@+id/grid"  
  
    android:numColumns="auto_fit"  
    android:stretchMode="columnWidth"  
    android:layout_width="409dp"  
    android:layout_height="729dp" />
```

```
</LinearLayout>
```

```
</RelativeLayout>
```

Output



Result

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

Experiment No.: 14

Aim

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

CO4

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

Procedure

MainActivity.java

```
package com.example.spinner;

import 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;
    String[] courses={"select a course","java","python","django"};

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        spinner=findViewById(R.id.spinner);
        ArrayAdapter<String> aa=new ArrayAdapter<>(this, android.R.layout.simple_spinner_item,courses);
        aa.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        spinner.setAdapter(aa);
        spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
                if(i!=0)
                {
                    Toast.makeText(getApplicationContext(), "selected course is: "+courses[i],
Toast.LENGTH_LONG).show();
                }
            }

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

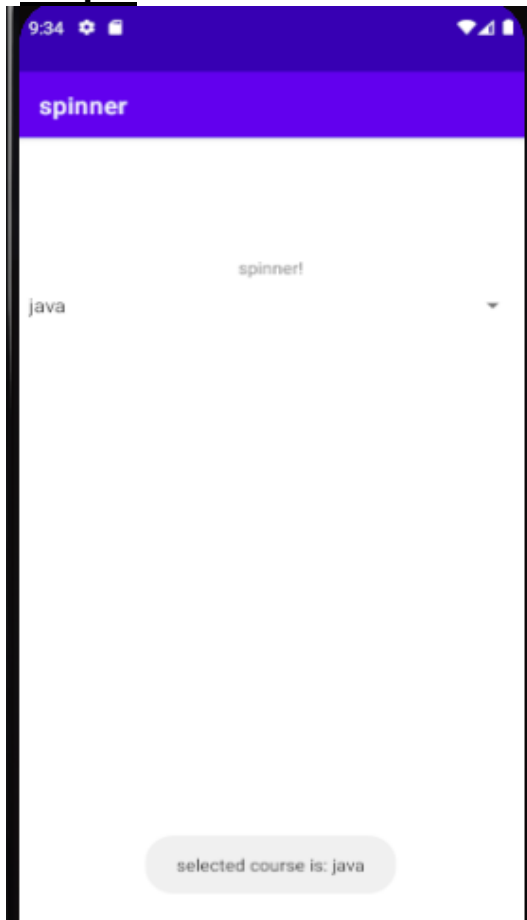
            }
        });
    }
}
```



```
}  
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>  
<LinearLayout  
    xmlns:tools="http://schemas.android.com/tools"  
    xmlns:android="http://schemas.android.com/apk/res/android"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    android:orientation="vertical"  
    tools:context=".MainActivity">  
  
    <TextView  
        android:layout_width="wrap_content"  
        android:layout_height="wrap_content"  
        android:layout_gravity="center_horizontal"  
        android:layout_marginTop="100dp"  
        android:text="spinner!" />  
  
    <Spinner  
        android:id="@+id/spinner"  
        android:layout_width="match_parent"  
        android:layout_height="wrap_content"  
        android:layout_marginTop="10dp"/>  
  
</LinearLayout>
```

Output**Result**

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

Experiment No.: 15

Aim

Develop an application using fragments.

CO4

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

Procedure

MainActivity.java

```
package com.example.fragment;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

        getSupportFragmentManager().beginTransaction()
            .replace(R.id.fragment_container, new FragmentOne())
            .commit();
    }
}
```

Fragmentone.java

```
package com.example.fragment;

import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;

public class FragmentOne extends Fragment {

    @Nullable
    @Override
    public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup container,
        @Nullable Bundle savedInstanceState) {
        View view = inflater.inflate(R.layout.activity_fragment_one, container, false);

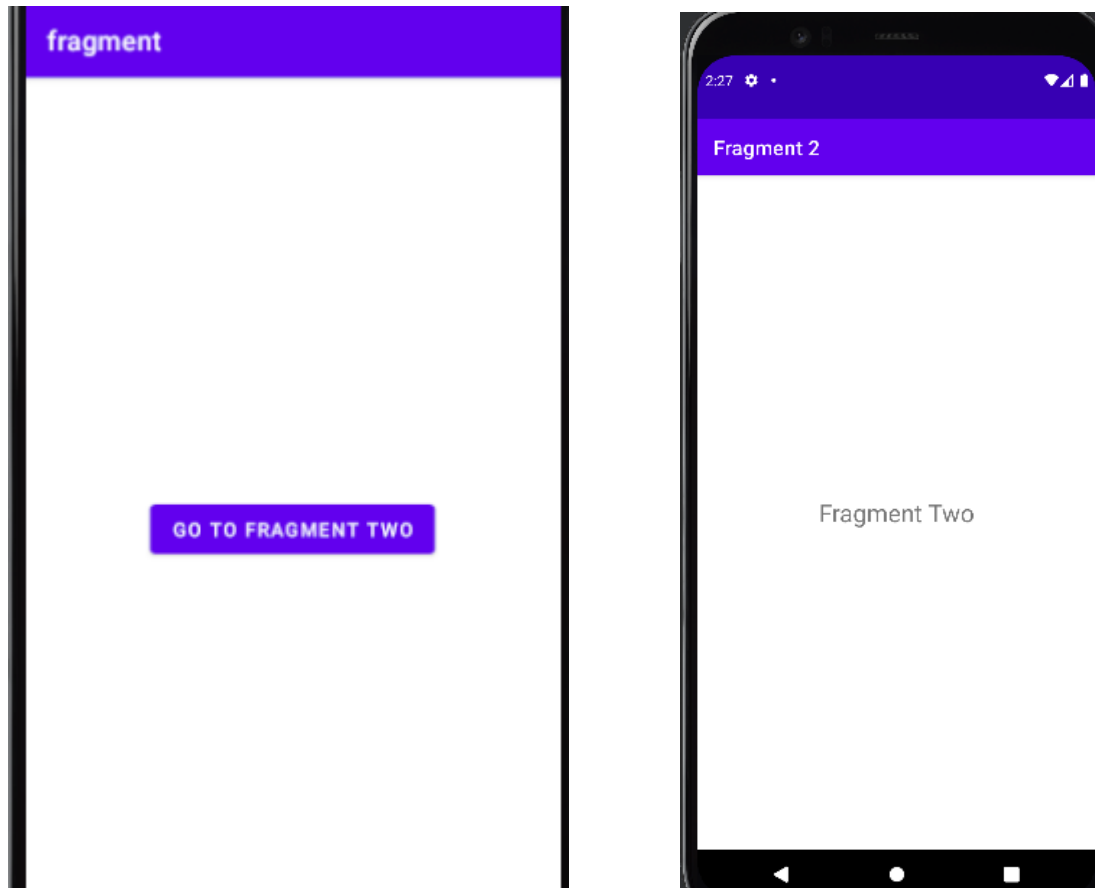
        Button btnFragmentTwo = view.findViewById(R.id.btn_fragment_two);
    }
}
```

```
        btnFragmentTwo.setOnClickListener(new View.OnClickListener() {  
            @Override  
            public void onClick(View v) {  
                // Replace FragmentOne with FragmentTwo  
                getActivity().getSupportFragmentManager().beginTransaction()  
                    .replace(R.id.fragment_container, new FragmentTwo())  
                    .addToBackStack(null)  
                    .commit();  
            }  
        });  
  
        return view;  
    }  
}
```

Fragment2.java

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

Output



Result

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

Experiment No.: 16**Aim**

Develop an application using fragments.

CO4

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

Procedure**MainActivity.java**

```
import androidx.annotation.NonNull;
import androidx.appcompat.app.ActionBarDrawerToggle;
import androidx.appcompat.app.AppCompatActivity;
import androidx.drawerlayout.widget.DrawerLayout;
import android.os.Bundle;
import android.view.MenuItem;

public class MainActivity extends AppCompatActivity {

    public DrawerLayout drawerLayout;
    public ActionBarDrawerToggle actionBarDrawerToggle;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        drawerLayout = findViewById(R.id.my_drawer_layout);
        actionBarDrawerToggle = new ActionBarDrawerToggle(this, drawerLayout,
            R.string.nav_open, R.string.nav_close);
```

```
// override the onOptionsItemSelected()
// function to implement
// the item click listener callback
// to open and close the navigation
// drawer when the icon is clicked

@Override
public boolean onOptionsItemSelected(@NonNull MenuItem item) {

    if (actionBarDrawerToggle.onOptionsItemSelected(item)) {
        return true;
    }

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

nav_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:ignore="HardcodedText">

    <item
        android:id="@+id/nav_account"
        android:title="My Account" />

    <item
        android:id="@+id/nav_settings
```

```
android:title="Settings" />
```

```
<item
    android:id="@+id/nav_logout"
    android:title="Logout" />
```

```
</menu>
savedInstanceState) {
```

activity_main.xml

```
<android.support.v4.widget.DrawerLayout
    xmlns:android="https://schemas.android.com/apk/res/android"
    android:id="@+id/drawer_layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent" >
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
```

```
<LinearLayout
    android:id="@+id/container_toolbar"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical">
```

```
<include
    android:id="@+id/toolbar"
    layout="@layout/toolbar" />
</LinearLayout>
```

```
<FrameLayout
    android:id="@+id/content_frame"
    android:layout_width="match_parent"
    android:layout_height="match_parent" />
```

```
</LinearLayout>
```

```
<ListView
    android:id="@+id/left_drawer"
    android:layout_width="240dp
```



```
android:layout_height="match_parent"
    android:layout_gravity="start"
    android:background="#FFFFFF"
    android:choiceMode="singleChoice"
    android:divider="@android:color/darker_gray"
    android:dividerHeight="1dp" />

</android.support.v4.widget.DrawerLayout>
```

Resources.xml

```
<resources>
    <string name="app_name">Navigation Drawer</string>
    <!-- to toggle the open close button of the navigation drawer -->
    <string name="nav_open">Open</string>
    <string name="nav_close">Close</string>
</resources>
```

Output



Result

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

Experiment No.: 17**Aim**

Create database using SQLite and perform INSERT and SELECT

CO5

Develop mobile applications using SQLite.

Procedure**MainActivity.java**

```
package com.example.curd;

import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.Cursor;
import android.database.SQLException;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    TextView tx;

    EditText et1, et2, et3;

    Button b1, b2, b3, b4;

    String rno, name, dept;

    SQLiteDatabase db;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

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

```
tx = findViewById(R.id.tv);
et1 = findViewById(R.id.e1);
et2 = findViewById(R.id.e2);
et3 = findViewById(R.id.e3);
b1 = findViewById(R.id.button);
b2 = findViewById(R.id.button2);
b3 = findViewById(R.id.button3);
b4 = findViewById(R.id.button4);
DBHelper dbHelper = new DBHelper(this);
db = dbHelper.getWritableDatabase();
}

public void onUpdate(View view) {
    rno = et1.getText().toString();
    name = et2.getText().toString();
    dept = et3.getText().toString();
    if (rno.isEmpty() || name.isEmpty() || dept.isEmpty()) {
        Toast.makeText(this, "PLEASE ENTER VALUES", Toast.LENGTH_LONG).show();
    } else {
        ContentValues values = new ContentValues();
        values.put("rollno", rno);
        values.put("name", name);
        values.put("dept", dept);
        int rowsAffected = db.update("student", values, "rollno=?", new String[]{rno});
        if (rowsAffected > 0) {
            Toast.makeText(this, "UPDATED", Toast.LENGTH_LONG).show();
        } else {
            Toast.makeText(this, "No record found for roll number: " + rno,
                Toast.LENGTH_LONG).show();
        }
    }
}
```

```
public void onDelete(View view) {  
    rno = et1.getText().toString();  
    if (rno.isEmpty()) {  
        Toast.makeText(this, "PLEASE ENTER ROLLNO TO DELETE",  
            Toast.LENGTH_LONG).show();  
    } else {  
        int rowsDeleted = db.delete("student", "rollno="+rno, null);  
        if (rowsDeleted > 0) {  
            Toast.makeText(this, "DELETED", Toast.LENGTH_LONG).show();  
        } else {  
            Toast.makeText(this, "Failed to delete", Toast.LENGTH_LONG).show();  
        }  
    }  
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:app="http://schemas.android.com/apk/res-auto"  
    xmlns:tools="http://schemas.android.com/tools"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    tools:context=".MainActivity">  
    <TextView  
        android:id="@+id/tv"  
        android:layout_width="108dp"  
        android:layout_height="47dp"  
        android:layout_centerHorizontal="true"  
        android:text="Student Detail" />  
    <EditText  
        android:id="@+id/e1"
```

```
        android:layout_height="wrap_content"
        android:layout_below="@+id/tv"
        android:layout_centerHorizontal="true"
        android:hint="Roll No:" />
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Student Name:"
    android:layout_centerHorizontal="true"
    android:id="@+id/e2"
    android:layout_below="@+id/e1"/>
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Department"
    android:layout_centerHorizontal="true"
    android:id="@+id/e3"
    android:layout_below="@+id/e2"/>
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/e3"
    android:layout_centerHorizontal="true"
    android:onClick="onInsert"
    android:text="Insert" />
<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
```

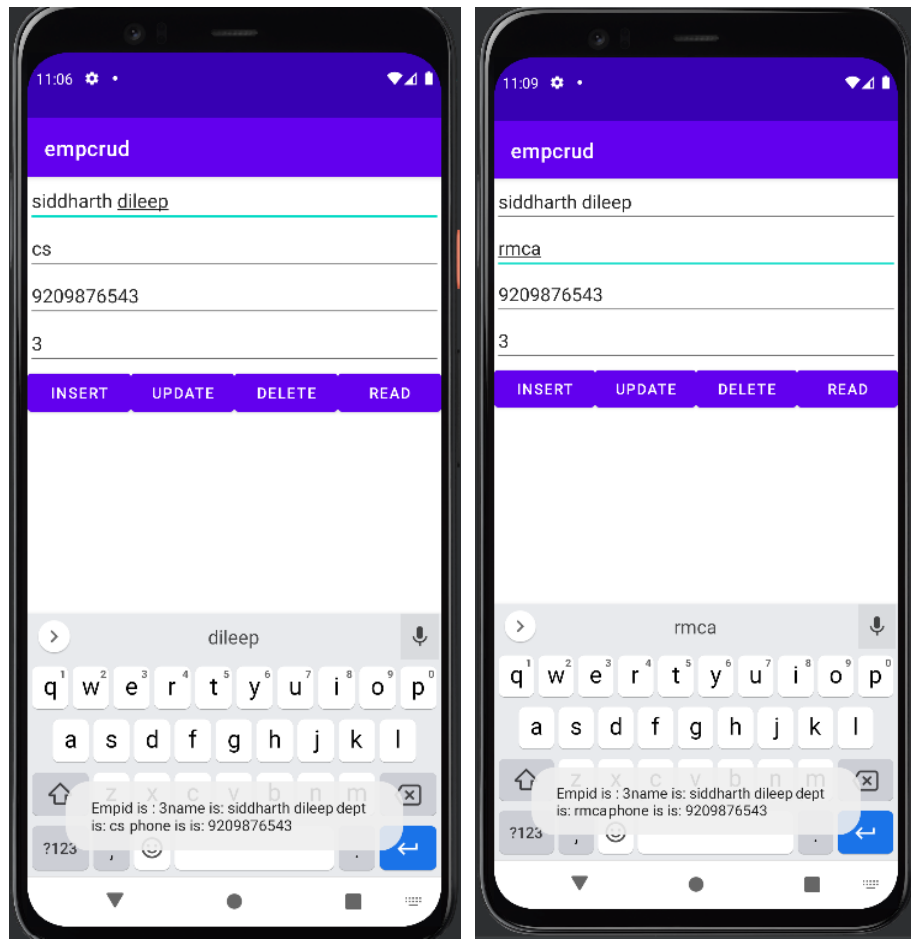
```
        android:text="View"
        android:onClick="onView"
        android:layout_below="@+id/button"/>
<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:text="Update"
    android:onClick="onUpdate"
    android:layout_below="@+id/button2"/>
<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:text="Delete"
    android:onClick="onDelete"
    android:layout_below="@+id/button3"/>
</RelativeLayout>
```

DBHelper.java

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

```
        sqLiteDatabase.execSQL("Create table student(rollno int,name varchar(20),dept  
varchar(5))");  
    }  
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {  
        sqLiteDatabase.execSQL("drop table if exists student");  
        onCreate(sqLiteDatabase);  
    }  
}
```

Output



Result

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

Experiment No.: 18**Aim**

Perform UPDATE and DELETE on SQLite database

CO5

Develop mobile applications using SQLite.

Procedure**MainActivity.java**

```
package com.example.curd;

import androidx.appcompat.app.AppCompatActivity;
import android.content.ContentValues;
import android.database.Cursor;
import android.database.SQLException;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    TextView tx;
    EditText et1, et2, et3;
    Button b1, b2, b3, b4;
    String rno, name, dept;
    SQLiteDatabase db;

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

```
tx = findViewById(R.id.tv);
et1 = findViewById(R.id.e1);
et2 = findViewById(R.id.e2);
et3 = findViewById(R.id.e3);
b1 = findViewById(R.id.button);
b2 = findViewById(R.id.button2);
b3 = findViewById(R.id.button3);
b4 = findViewById(R.id.button4);
DBHelper dbHelper = new DBHelper(this);
db = dbHelper.getWritableDatabase();
}

public void onUpdate(View view) {
    rno = et1.getText().toString();
    name = et2.getText().toString();
    dept = et3.getText().toString();
    if (rno.isEmpty() || name.isEmpty() || dept.isEmpty()) {
        Toast.makeText(this, "PLEASE ENTER VALUES", Toast.LENGTH_LONG).show();
    } else {
        ContentValues values = new ContentValues();
        values.put("rollno", rno);
        values.put("name", name);
        values.put("dept", dept);
        int rowsAffected = db.update("student", values, "rollno=?", new String[]{rno});
        if (rowsAffected > 0) {
            Toast.makeText(this, "UPDATED", Toast.LENGTH_LONG).show();
        } else {
            Toast.makeText(this, "No record found for roll number: " + rno,
                Toast.LENGTH_LONG).show();
        }
    }
}
```

```
public void onDelete(View view) {  
    rno = et1.getText().toString();  
    if (rno.isEmpty()) {  
        Toast.makeText(this, "PLEASE ENTER ROLLNO TO DELETE",  
            Toast.LENGTH_LONG).show();  
    } else {  
        int rowsDeleted = db.delete("student", "rollno="+rno, null);  
        if (rowsDeleted > 0) {  
            Toast.makeText(this, "DELETED", Toast.LENGTH_LONG).show();  
        } else {  
            Toast.makeText(this, "Failed to delete", Toast.LENGTH_LONG).show();  
        }  
    }  
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>  
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
    xmlns:app="http://schemas.android.com/apk/res-auto"  
    xmlns:tools="http://schemas.android.com/tools"  
    android:layout_width="match_parent"  
    android:layout_height="match_parent"  
    tools:context=".MainActivity">  
    <TextView  
        android:id="@+id/tv"  
        android:layout_width="108dp"  
        android:layout_height="47dp"  
        android:layout_centerHorizontal="true"  
        android:text="Student Detail" />  
    <EditText  
        android:id="@+id/e1"  
        android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:layout_below="@+id/tv"
        android:layout_centerHorizontal="true"
        android:hint="Roll No:" />
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Student Name:"
    android:layout_centerHorizontal="true"
    android:id="@+id/e2"
    android:layout_below="@+id/e1"/>
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:hint="Department"
    android:layout_centerHorizontal="true"
    android:id="@+id/e3"
    android:layout_below="@+id/e2"/>
<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/e3"
    android:layout_centerHorizontal="true"
    android:onClick="onInsert"
    android:text="Insert" />
<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
```

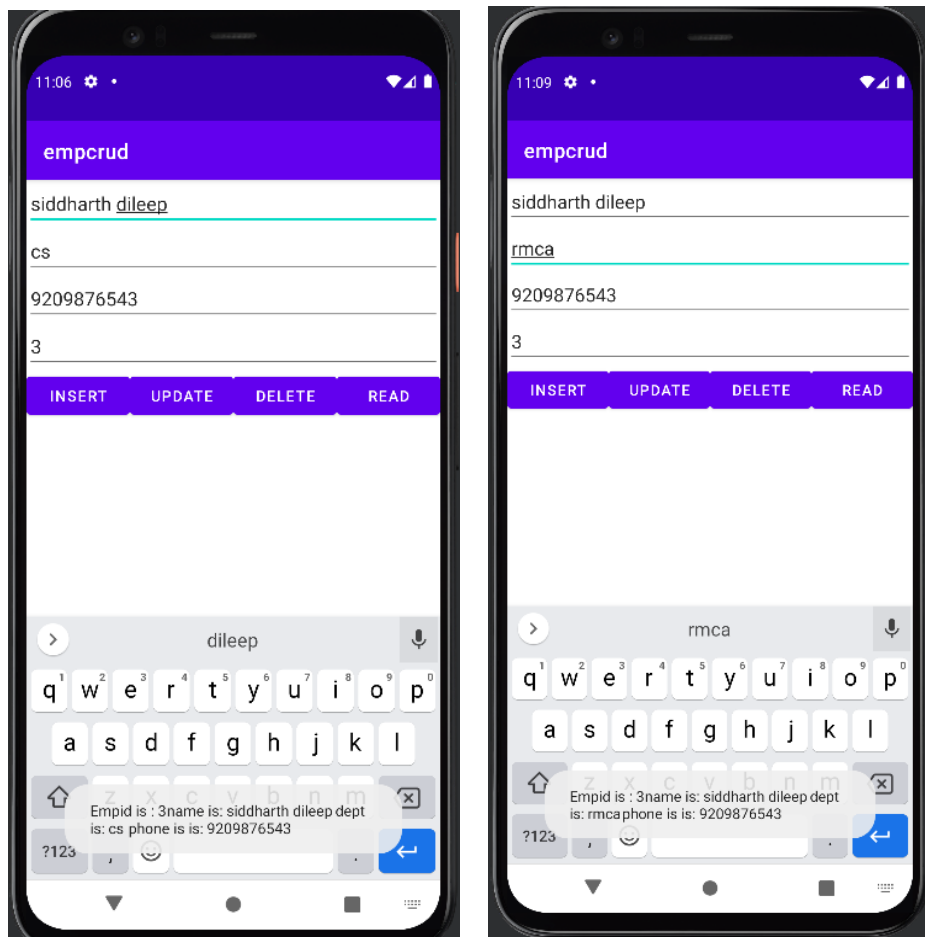
```
        android:text="View"
        android:onClick="onView"
        android:layout_below="@+id/button"/>
<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:text="Update"
    android:onClick="onUpdate"
    android:layout_below="@+id/button2"/>
<Button
    android:id="@+id/button4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:text="Delete"
    android:onClick="onDelete"
    android:layout_below="@+id/button3"/>
</RelativeLayout>
```

DBHelper.java

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

```
        sqLiteDatabase.execSQL("Create table student(rollno int,name varchar(20),dept  
varchar(5))");  
    }  
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1) {  
        sqLiteDatabase.execSQL("drop table if exists student");  
        onCreate(sqLiteDatabase);  
    }  
}
```

Output



Result

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