SDM COLLEGE, UJIRE

SOFTWARE AND APP DEVELOPMENT
DEPARTMENT OF BVOC

LAB MANUAL

(2020-21)

MOBILE APPLICATION DEVELOPMENT LABORATORY

SEMESTER – IV

Laboratory Code **BVOCASP253** IA Marks 30 Exam Marks 120 Exam Hours 03 CREDITS – 06

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Laboratory Experiments:	
	Part-A
1.	Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.
2	Develop an Android application using controls like Button, TextView, and EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.
3	Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules: • Password should contain uppercase and lowercase letters. • Password should contain letters and numbers. • Password should contain special characters. • Minimum length of the password (the default value is 8). On successful SIGN UP proceed to the next Login activity. Here the user should SIGN IN using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying “Successful Login” or else display a toast message saying “Login Failed”. The user is given only two attempts and after that display a toast message saying “Failed Login Attempts” and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.
4	Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.
5	Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from one and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextView control.
6	Develop a simple application with one EditText so that the user can write some text in it. Create a button called “Convert Text to Speech” that converts the user input text into voice
7	Create an activity like a phone dialer with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.
	Part-B
8	Write a program to enter Medicine Name, Date and Time of the Day as input from the user and store it in the SQLite database. Input for Time of the Day should be either Morning or Afternoon or Evening or Night. Trigger an alarm based on the Date and Time of the Day and display the Medicine Name.
9	Develop a content provider application with an activity called “Meeting Schedule” which takes Date, Time and Meeting Agenda as input from the user and store this information into the SQLite database. Create another application with an activity called “Meeting Info” having Date Picker control, which on the selection of a date should display the Meeting Agenda information for that particular date, else it should display a toast message saying “No Meeting on this Date”.

10	Create an application to receive an incoming SMS, which is notified to the user. On clicking this SMS notification, the message content and the number should be displayed on the screen. Use appropriate emulator control to send the SMS message to your application.
11	Write a program to create an activity having a Text box, and also Save, Open and Create buttons. The user has to write some text in the Text box. On pressing the Create button the text should be saved as a text file in SDcard. On subsequent changes to the text, the Save button should be pressed to store the latest content to the same file. On pressing the Open button, it should display the contents from the previously stored files in the Text box. If the user tries to save the contents in the Textbox to a file without creating it, then a toast message has to be displayed saying “First Create a File”
12	Create an application to demonstrate a basic media player that allows the user to Forward, Backward, Play and Pause an audio. Also, make use of the indicator in the seek bar to move the audio forward or backward as required.
13	Develop an application that makes use of the clipboard framework for copying and pasting of the text. The activity consists of two EditText controls and two Buttons to trigger the copy and paste functionality
14	Create an AIDL service that calculates Car Loan EMI. The formula to calculate EMI is E = P * (r(1+r)n)/((1+r)n -1) where E = The EMI payable on the car loan amount P = The Car loan Principal Amount r = The interest rate value computed on a monthly basis n = The loan tenure in the form of months The down payment amount has to be deducted from the principal amount paid towards buying the Car. Develop an application that makes use of this AIDL service to calculate the EMI. This application should have four EditText to read the Principal Amount, Down Payment, Interest Rate, Loan Term (in months) and a button named as “Calculate Monthly EMI”. On click of this button, the result should be shown in a TextView. Also, calculate the EMI by varying the Loan Term and Interest Rate values

Program-1: Create an application to design a Visiting Card. The Visiting card should have a company logo at the top right corner. The company name should be displayed in Capital letters, aligned to the center. Information like the name of the employee, job title, phone number, address, email, fax and the website address is to be displayed. Insert a horizontal line between the job title and the phone number.

1) Firstly Create an Application by Name "VisitingCardApp"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component change the following properties:
    - Size: 38dp
    - Text: VVCE
    - Align left top

4) Add ImageView to design and in type choose "IC_LAUNCHER_FOREGROUND"
    - Download the logo & copy the same in res->drawable folder
    - In xml code of imageview change srcCompat="@drawable/logo"
    - Align right top

5) Add View component & change the following properties:
    - Height: 4dp
    - Background: "#4444" (black color)

6) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Nithin Kumar
    - Style: Bold
    - Align center

7) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Assistant Professor-CSE
    - Align center

8) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Address-Kannada Sahithya Parishath Road, Mysuru-02
    - Align: center

9) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Email-nithingowda021@vvce.ac.in
    - Align: center

10) Add TextView component change the following properties:
    - Size: 20dp
    - Text: Phone-8050462225

XML-CODE

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginStart="17dp"
        android:layout_marginLeft="17dp"
        android:layout_marginTop="17dp"
        android:layout_marginEnd="244dp"
        android:layout_marginRight="244dp"
        android:layout_marginBottom="486dp"
        android:text="VVCE"
        android:textSize="38dp" />

    <ImageView  android:id="@+id/imageView"
        android:layout_width="231dp"
        android:layout_height="174dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="-14dp"
        android:layout_marginRight="-14dp"
        android:layout_marginBottom="481dp"
        app:srcCompat="@drawable/logo" />

    <View
        android:id="@+id/view"
        android:layout_width="wrap_content"
        android:layout_height="4dp"
        android:layout_alignParentBottom="true"
        android:background="#4444"
        android:layout_marginBottom="466dp" />
```

```
<TextView android:id="@+id/textView2"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentRight="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="117dp"
   android:layout_marginRight="117dp"
   android:layout_marginBottom="394dp"
   android:text="Nithin Kumar"
   android:textSize="30dp"
   android:textStyle="bold" />

<TextView android:id="@+id/textView3"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentRight="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="64dp"
   android:layout_marginRight="64dp"
   android:layout_marginBottom="343dp"
   android:text="Assistant Professor-CSE"
   android:textSize="25dp" />

<TextView android:id="@+id/textView4"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentRight="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="127dp"
   android:layout_marginRight="127dp"
   android:layout_marginBottom="294dp"
   android:text="Ph No: 8050462225"
   android:textSize="20dp" />

<TextView android:id="@+id/textView5"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentRight="true"
```

```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="10dp"
        android:layout_marginRight="10dp"
        android:layout_marginBottom="229dp"
        android:text="Kannada Sahitya Parishath Road Gokulam 3rd Stage Mysuru-02"
        android:textSize="20dp" />

    <TextView android:id="@+id/textView6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="44dp"
        android:layout_marginRight="44dp"
        android:layout_marginBottom="189dp"
        android:text="Email: nithingowda021@vvce.ac.in"
        android:textSize="20dp" />
</RelativeLayout>
```

JAVA-CODE

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity {
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

OUTPUT:

Program-2: Develop an Android application using controls like Button, TextView, EditText for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.

1) Firstly Create an Application by Name "SimpleCalci"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: Simple Calci
   - Center-Align
4) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the first number"
   - id: "@+id/editText1"

5) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the second number"
   - id: "@+id/editText2"
6) Add TextView component to display result & change the following properties:
   - Size: 40dp
   - Text: "0"
   - Center-Align
   - id: "@+id/textView1"

7) Add 4 Buttons & rename the four buttons "Add", "Sub","Mul" and "div" with following addition:
   - Onclick: "doAdd"(Add Button)
   - Onclick: "doSub"(Sub Button)
   - Onclick: "doMul"(Mul Button)
   - Onclick: "doDiv"(Div Button)

XML-CODE:

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

  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
```

```
    android:layout_marginEnd="98dp"
    android:layout_marginBottom="653dp"
    android:text="SIMPLE CALCI"
    android:textSize="38dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.042" />

  <EditText
    android:id="@+id/editText1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="115dp"
    android:layout_marginBottom="547dp"
    android:ems="10"
    android:hint="Enter the First Number"
    android:inputType="textPersonName"
    android:text="" />

  <EditText
    android:id="@+id/editText2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="111dp"
    android:layout_marginBottom="455dp"
    android:ems="10"
    android:inputType="textPersonName"
    android:hint="Enter the Second Number"
    android:text="" />

  <TextView android:id="@+id/textView1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="203dp"
    android:layout_marginBottom="350dp"
    android:text="0"  android:textSize="40dp"
    />

  <Button
    android:id="@+id/button"
```

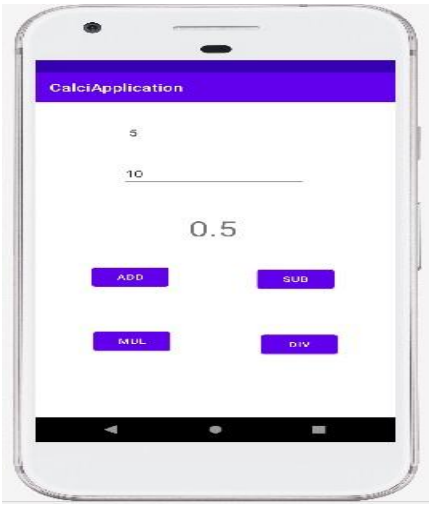
```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="274dp"
        android:layout_marginBottom="237dp"
        android:onClick="doAdd"
        android:text="ADD" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="68dp"
        android:layout_marginBottom="233dp"
        android:onClick="doSub"
        android:text="SUB" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="277dp"
        android:layout_marginBottom="115dp"
        android:onClick="doMul"
        android:text="MUL" />

    <Button
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="63dp"
        android:layout_marginBottom="104dp"
        android:onClick="doDiv"
        android:text="DIV" />

</RelativeLayout>
```

JAVA-CODE:

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

```
public class MainActivity extends AppCompatActivity {
   EditText e1,e2;
   TextView tv1;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      e1 = (EditText)findViewById(R.id.editText1); e2
      = (EditText)findViewById(R.id.editText2); tv1 =
      (TextView)findViewById(R.id.textView1);
   }
   public void doAdd(View V){
      int a1 = Integer.parseInt(e1.getText().toString()); int
      a2  =  Integer.parseInt(e2.getText().toString());  int
      result= a1+a2;
      tv1.setText(""+result);
   }
   public void doSub(View V){
      int a1 = Integer.parseInt(e1.getText().toString()); int
      a2  =  Integer.parseInt(e2.getText().toString());  int
      result= a1-a2;
      tv1.setText(""+result);
   }
   public void doMul(View V){
      int a1 = Integer.parseInt(e1.getText().toString()); int
      a2  =  Integer.parseInt(e2.getText().toString());  int
      result= a1*a2;
      tv1.setText(""+result);
   }
   public void doDiv(View V){
      int a1 = Integer.parseInt(e1.getText().toString()); int
      a2 = Integer.parseInt(e2.getText().toString()); float
      result= a1/a2;
      tv1.setText(""+result);
   }
}
```

OUTPUT:



Program-3: Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules:

- **Password should contain uppercase and lowercase letters.**
- **Password should contain letters and numbers.**
- **Password should contain special characters.**
- **Minimum length of the password (the default value is 8).**

On successful SIGN UP proceed to the next Login activity. Here the user should SIGN IN using the Username and Password created during signup activity. If the Username and Password are matched then navigate to the next activity which displays a message saying "Successful Login" or else display a toast message saying "Login Failed". The user is given only two attempts and after that display a toast message saying "Failed Login Attempts" and disable the SIGN IN button. Use Bundle to transfer information from one activity to another.

1) Firstly Create an Application by Name "SignUpActivity"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
    - Size: 38dp
    - Text: "Sign Up"
    - Center-Align
4) Add Email (EditText) component & change the following properties in XML Code:
    - Hint: "Email ID"
    - id: "@+id/emailEditText"

5) Add Password (EditText) component & change the following properties in XML Code:
    - Hint: "Password"
    - id: "@+id/passwordEditText"
6) Add Button component & change the following properties in XML
    - Id: "@+id/signBtn"
    - Text: "Sign Up"

XML-CODE

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

  <TextView android:layout_width="160dp"
    android:layout_height="42dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="112dp"
```

```
        android:layout_marginBottom="573dp"
        android:text="Sign Up"
        android:textSize="28dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText android:id="@+id/emailEditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="29dp"
        android:layout_marginBottom="431dp"
        android:ems="10"
        android:hint="Email ID"
        android:inputType="textEmailAddress"
        android:textSize="28dp" />

    <EditText
        android:id="@+id/passwordEditText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="34dp"
        android:layout_marginBottom="345dp"
        android:ems="10" android:hint="Password"
        android:inputType="textPassword"
        android:textSize="28dp" />

    <Button
        android:id="@+id/signUpBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="106dp"
        android:layout_marginBottom="226dp"
        android:text="Sign Up"
        android:textSize="28dp" />

</RelativeLayout>
```

JAVA-CODE

```
package com.example.loginapplication;

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; import
android.widget.Toast;

import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
   EditText emailEditText, passwordEditText;
   Button signUpBtn;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      emailEditText = findViewById(R.id.emailEditText);
      passwordEditText = findViewById(R.id.passwordEditText);
      signUpBtn = findViewById(R.id.signUpBtn);
      signUpBtn.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            String email = emailEditText.getText().toString();
            String password = passwordEditText.getText().toString(); if
            (!isValidPassword(password)) {
               Toast.makeText(MainActivity.this, "Password Does not match the rules",
Toast.LENGTH_LONG).show();
               return;
            }
            Intent intent = new Intent(MainActivity.this, LoginActivity.class);
            intent.putExtra("email", email);
            intent.putExtra("password", password);
            startActivity(intent);
         }
      });
   }

   Pattern lowercase = Pattern.compile("^.*[a-z].*$");
   Pattern uppercase = Pattern.compile("^.*[A-Z].*$");
   Pattern number = Pattern.compile("^.*[0-9].*$");
   Pattern specialCharacter = Pattern.compile("^.*[^a-zA-Z0-9].*$");
```

```
    private Boolean isValidPassword(String password) { if
      (password.length() < 8) {
         return false;
      }
      if (!lowercase.matcher(password).matches()) {
         return false;
      }
      if (!uppercase.matcher(password).matches()) {
         return false;
      }
      if (!number.matcher(password).matches()) {
         return false;
      }
      if (!specialCharacter.matcher(password).matches()) {
         return false;
      }
      return true;
   }
}
```

7) Right click on Java folder-> new-> activity->empty activity-> name it as "LoginActivity"
8) Go to xml code of design change the layout to "RelativeLayout"
9) Add TextView component & change the following properties:
    - Size: 38dp
    - Text: "Login"
    - Center-Align
10) Add Email (EditText) component & change the following properties in XML Code:
    - Hint: "Email ID"
    - id: "@+id/emailEditText"

11) Add Password (EditText) component & change the following properties in XML Code:
    - Hint: "Password"
    - id: "@+id/passwordEditText"
12) Add Button component & change the following properties in XML
    - Id: "@+id/loginBtn"
    - Text: "Login"

XML-CODE

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

```
    tools:context=".LoginActivity">

    <TextView android:id="@+id/textView"
       android:layout_width="210dp"
       android:layout_height="54dp"
       ndroid:layout_alignParentEnd="true"
       android:layout_alignParentBottom="true"
       android:layout_marginEnd="120dp"
       android:layout_marginBottom="576dp"
       android:text="Login Activity"
       android:textSize="28dp" />

    <EditText android:id="@+id/emailEditText"
       android:layout_width="222dp"
       android:layout_height="80dp"
       android:layout_alignParentEnd="true"
       android:layout_alignParentBottom="true"
       android:layout_marginEnd="108dp"
       android:layout_marginBottom="424dp"
       android:ems="10"
       android:hint="Email ID"
       android:inputType="textEmailAddress"
       android:textSize="28dp" />

    <EditText
       android:id="@+id/passwordEditText"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:layout_alignParentEnd="true"
       android:layout_alignParentBottom="true"
       android:layout_marginEnd="40dp"
       android:layout_marginBottom="299dp"
       android:ems="10" android:hint="Password"
       android:inputType="textPassword"
       android:textSize="28dp" />

    <Button
       android:id="@+id/loginBtn"
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:layout_alignParentEnd="true"
       android:layout_alignParentBottom="true"
       android:layout_marginEnd="173dp"
       android:layout_marginBottom="189dp"
       android:text="login"
       android:textSize="26dp" />
```

```
</RelativeLayout>
```

JAVA-CODE

```
package com.example.loginapplication;

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; import
android.widget.Toast;

public class LoginActivity extends AppCompatActivity {
EditText emailEditText, passwordEditText;
Button loginBtn;
int counter=2;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_login);
      emailEditText=findViewById(R.id.emailEditText);
      passwordEditText=findViewById(R.id.passwordEditText);
      loginBtn=findViewById(R.id.loginBtn);
      String registeredEmail=getIntent().getStringExtra("email");
      String registeredPassword=getIntent().getStringExtra("password");
      loginBtn.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            String email=emailEditText.getText().toString();
            String password=passwordEditText.getText().toString();
            if(registeredEmail.equals(email)&& registeredPassword.equals(password))
            {
               Intent intent=new Intent(LoginActivity.this,LoginSuccessActivity.class);
               startActivity(intent);
            }
            else{
               Toast.makeText(LoginActivity.this,"Invalid
Credentials",Toast.LENGTH_LONG).show();
            }
            counter--;
            if (counter==0)
            {
               Toast.makeText(getBaseContext(),"FAILED LOGIN
ATTEMPTS",Toast.LENGTH_LONG).show();
               loginBtn.setEnabled(false);
            }
```

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

13) Right click on Java folder-> new-> activity->empty activity-> name it as "LoginSuccessful"
14) Go to xml code of design change the layout to "RelativeLayout"
15) Add TextView component & change the following properties:
    - Size: 38dp
    - Text: "Login Successful"
    - Center-Align

XML-CODE

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

  <TextView android:id="@+id/textView2"
    android:layout_width="297dp"
    android:layout_height="190dp"
    android:layout_alignParentEnd="true"
    android:layout_alignParentBottom="true"
    android:layout_marginEnd="42dp"
    android:layout_marginBottom="400dp"
    android:text="Login Successful"
    android:textSize="38dp" />
</RelativeLayout>
```

JAVA-CODE

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

OUT-PUT

Program-4: Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds.

1) Firstly Create an Application by Name "WallpaperActivity"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: Wall Paper Change Application
   - Center-Align
4) Add Button component & change the following properties:
   - Size: 38dp
   - Text: Click Here To Change Wall Paper
5) Save five images (jpg format) in the drawable folder. In this example one.jpg, two.jpg, three.jpg, four.jpg and five.jpg images are saved in drawable folder.

XML-CODE

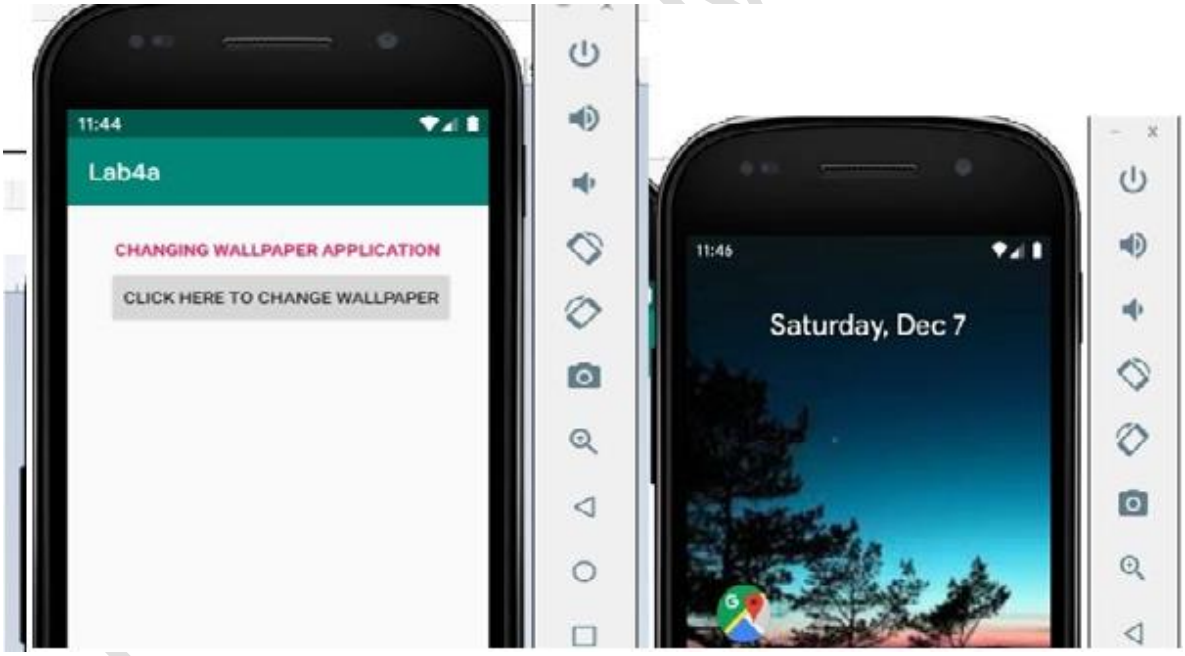
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"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

   <TextView android:id="@+id/textView"
      android:layout_width="210dp"
      android:layout_height="54dp"
      android:layout_alignParentEnd="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="120dp"
      android:layout_marginBottom="576dp"
      android:text="Wall Paper Change Application"
      android:textSize="28dp" />
<Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="173dp"
      android:layout_marginBottom="189dp"
      android:text="Click Here To Change Wall Paper"
      android:textSize="26dp" />
</RelativeLayout>
```

JAVA-CODE

```
import androidx.appcompat.app.AppCompatActivity;
import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.drawable.AnimationDrawable;
import android.graphics.drawable.BitmapDrawable; import
android.graphics.drawable.Drawable;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import java.io.IOException;
import java.util.Timer;
import java.util.TimerTask;
public class MainActivity extends AppCompatActivity {
Button changewallpaper;
Timer mytimer; Drawable
drawable;
WallpaperManager wpm;
int prev=1;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
mytimer = new Timer();
wpm = WallpaperManager.getInstance(this);
changewallpaper = findViewById(R.id.button);
changewallpaper.setOnClickListener(new View.OnClickListener() {
@Override public void onClick(View view) {
setWallpaper();
}
});
}
private void setWallpaper() {
mytimer.schedule(new TimerTask() {
@Override
public void run() {
if(prev==1) {
drawable = getResources().getDrawable(R.drawable.one);
prev = 2;
}
 else if(prev==2) {
drawable = getResources().getDrawable(R.drawable.two);
prev=3;}
```

```
else if(prev==3) {
drawable = getResources().getDrawable(R.drawable.three);
prev=4;
}
else if(prev==4) {
drawable = getResources().getDrawable(R.drawable.four);
prev=5;
}
else if(prev==5) {
drawable = getResources().getDrawable(R.drawable.five);
prev=1;
}
Bitmap wallpaper = ((BitmapDrawable)drawable).getBitmap(); try
{
wpm.setBitmap(wallpaper);
} catch (IOException e) {
e.printStackTrace();
}
}
},0,30000); } }
```

Output:



Program-5 : Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a TextViewcontrol.

1) Firstly Create an Application by Name "CounterActivity"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: "Counter Application"
   - Center-Align
4) Add TextView component & change the following properties:
   - Text: "Counter Value"
5) Add Button components & change the following properties:
   - Size: 38dp
   - Text: Start
   - id: "@+id/btn_start"
6) Add Button components & change the following properties:
   - Size: 38dp
   - Text: Stop
   - id: "@+id/btn_stop"

XML-CODE

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

   <TextView android:layout_width="378dp"
      android:layout_height="68dp"
      android:layout_alignParentEnd="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="18dp"
      android:layout_marginBottom="602dp"
      android:text="Counter Application"
      android:textSize="38dp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintLeft_toLeftOf="parent"
      app:layout_constraintRight_toRightOf="parent"
      app:layout_constraintTop_toTopOf="parent" />

   <TextView
      android:id="@+id/textView"
```

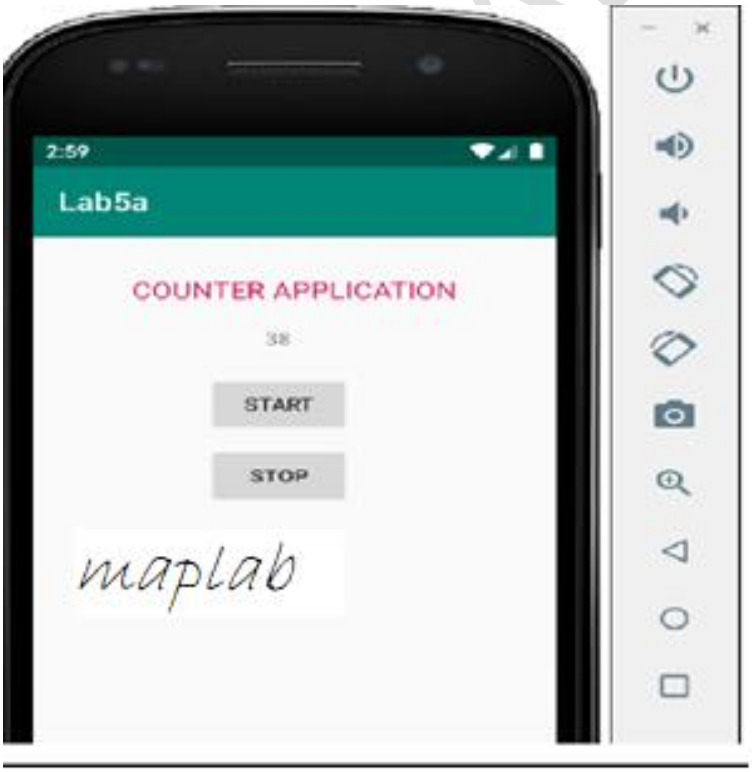
```
        android:layout_width="121dp"
        android:layout_height="32dp"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="145dp"
        android:layout_marginBottom="478dp"
        android:text="Counter Value" />

    <Button
        android:id="@+id/btn_start"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="297dp"
        android:layout_marginBottom="295dp"
        android:text="Start" />

    <Button
        android:id="@+id/btn_stop"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="74dp"
        android:layout_marginBottom="292dp"
        android:text="Stop" />

</RelativeLayout>
```

JAVA-CODE

```
package com.example.counterapplication;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.os.Handler; import
android.view.View; import
android.widget.Button; import
android.widget.TextView;

public class MainActivity extends AppCompatActivity {
Button btnstart, btnstop;
TextView txtcounter;
int i=1;
Handler customHandler=new Handler();
   @Override
```

```
    protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      btnstart=findViewById(R.id.btn_start);
      btnstop=findViewById(R.id.btn_stop);
      txtcounter=findViewById(R.id.textView);
      btnstart.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
          customHandler.postDelayed(updateTimerThread,0);
        }
      });
      btnstop.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
          customHandler.removeCallbacks(updateTimerThread);
        }
      });
    }
    private final Runnable updateTimerThread=new Runnable() {
      @Override
      public void run() { txtcounter.setText(""+i);
        customHandler.postDelayed(this,1000); i++;
      }
    };
}
```

Output:



Program-6: Develop a simple application with one EditText so that the user can write some text in it. Create a button called "Convert Text to Speech" that converts the user input text into voice.

1) Firstly Create an Application by Name "TextToSpeech"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
4) Size: 38dp
5) Text: Text2Speech App
6) Center-Align
7) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Enter the text to be converted"
   - id: "@+id/editText"

8) Add Button component & change the following properties in XML Code:
   - Name: Convert
   - onClick: convert

XML-CODE:

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

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
      android:layout_alignParentRight="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="59dp"
      android:layout_marginRight="59dp"
      android:layout_marginBottom="649dp"
      android:text="Text2SpeechApp"
      android:textSize="40dp" />

   <EditText
      android:id="@+id/editText"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
```

```
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="101dp"
        android:layout_marginRight="101dp"
        android:layout_marginBottom="514dp"
        android:ems="10"
        android:hint="Enter the text to be converted"
        android:inputType="textPersonName"
        android:text="" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="162dp"
        android:onClick="convert"
        android:layout_marginRight="162dp"
        android:layout_marginBottom="329dp"
        android:text="Convert" />
</RelativeLayout>
```

JAVA-CODE:

```
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    TextToSpeech t1;
    EditText e1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = findViewById(R.id.editText);
        t1 = new TextToSpeech(getApplicationContext(), new
TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int status) {
                if (status!=TextToSpeech.ERROR){
                    t1.setLanguage(Locale.UK);
                }
```

```
        }
      });
  }
  public void convert(View view){
    String tospeak = e1.getText().toString();
    t1.speak(tospeak,TextToSpeech.QUEUE_FLUSH,null);
  }
}
```

OUTPUT:

Program-7: Create an activity like a phone dialer with CALL and SAVE buttons. On pressing the CALL button, it must call the phone number and on pressing the SAVE button it must save the number to the phone contacts.

1) Firstly Create an Application by Name "CallActivity"
2) Go to xml code of design change the layout to "RelativeLayout"
3) Add TextView component & change the following properties:
   - Size: 38dp
   - Text: Call Activity
   - Center-Align
4) Add EditText component & change the following properties in XML Code:
   - id: "@+id/phoneNumberEditText"

5) Add PlainText(EditText) component & change the following properties in XML Code:
   - Text: ""
   - Hint: "Copied Text"
   - id: "@+id/editText2"
6) Add three buttons to the design & change the text of the Buttons to "Clear", "Call", "Save" and change the id as follows:
   - id:"@+id/clearBtn"
   - id:"@+id/callBtn"
   - id:"@+id/saveBtn"

7) Add twelve buttons to the design & change the text of the Buttons as 1,2,3,4,5,6,7,8,9,0,*,#

XML-CODE

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

   <TextView android:layout_width="298dp"
      android:layout_height="wrap_content"
      android:layout_alignParentEnd="true"
      android:layout_alignParentBottom="true"
      android:layout_marginEnd="54dp"
      android:layout_marginBottom="575dp"
      android:text="Call Application"
      android:textSize="36dp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintLeft_toLeftOf="parent"
      app:layout_constraintRight_toRightOf="parent"
      app:layout_constraintTop_toTopOf="parent" />
```

```
<EditText
   android:id="@+id/phoneNumberEditText"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="176dp"
   android:layout_marginBottom="462dp"
   android:ems="10"
   android:inputType="phone" />

<Button
   android:id="@+id/clearBtn"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="52dp"
   android:layout_marginBottom="459dp"
   android:text="Clear" />

<Button
   android:id="@+id/button2"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="311dp"
   android:onClick="inputNumber"
   android:layout_marginBottom="341dp"
   android:text="1" />

<Button
   android:id="@+id/button3"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:onClick="inputNumber"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="170dp"
   android:layout_marginBottom="341dp"
   android:text="2" />

<Button
   android:id="@+id/button4"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
```

```
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="32dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="343dp"
        android:text="3" />

    <Button
        android:id="@+id/button5"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:onClick="inputNumber"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="311dp"
        android:layout_marginBottom="241dp"
        android:text="4" />

    <Button
        android:id="@+id/button6"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="175dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="239dp"
        android:text="5" />

    <Button android:id="@+id/button7"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="32dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="239dp"
        android:text="6" />

    <Button
        android:id="@+id/button8"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="313dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="142dp"
        android:text="7" />
```

```
<Button
   android:id="@+id/button9"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="171dp"
   android:onClick="inputNumber"
   android:layout_marginBottom="147dp"
   android:text="8" />

<Button
   android:id="@+id/button10"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="34dp"
   android:onClick="inputNumber"
   android:layout_marginBottom="152dp"
   android:text="9" />

<Button
   android:id="@+id/button11"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="309dp"
   android:onClick="inputNumber"

   android:layout_marginBottom="80dp"
   android:text="#" />

<Button
   android:id="@+id/button12"
   android:layout_width="76dp"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentBottom="true"
   android:layout_marginEnd="169dp"
   android:onClick="inputNumber"
   android:layout_marginBottom="78dp"
   android:text="0" />

<Button
   android:id="@+id/button13"
   android:layout_width="76dp"
```

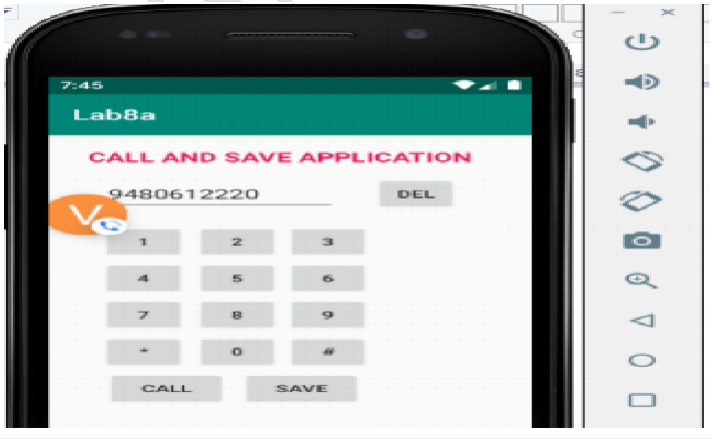
```
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="34dp"
        android:onClick="inputNumber"
        android:layout_marginBottom="88dp"
        android:text="*" />

    <Button
        android:id="@+id/callBtn"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="284dp"
        android:layout_marginBottom="17dp"
        android:text="Call" />

    <Button
        android:id="@+id/saveBtn"
        android:layout_width="76dp"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentBottom="true"
        android:layout_marginEnd="60dp"
        android:layout_marginBottom="17dp"
        android:text="Save" />
</RelativeLayout>
```

JAVA-CODE

```
package com.example.callingapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
EditText phoneNumberEditText;
Button clearBtn,callBtn,saveBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        phoneNumberEditText=findViewById(R.id.phoneNumberEditText);
```

```
        callBtn=findViewById(R.id.callBtn);
        saveBtn=findViewById(R.id.saveBtn);
        clearBtn=findViewById(R.id.clearBtn);
        clearBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                phoneNumberEditText.setText("");
            }
        });
        callBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String phoneNumber=phoneNumberEditText.getText().toString();
                Intent intent=new Intent(Intent.ACTION_DIAL);
                intent.setData(Uri.parse("tel:"+phoneNumber)); startActivity(intent);
            }
        });
        saveBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String phoneNumber=phoneNumberEditText.getText().toString(); Intent
                intent=new Intent(Intent.ACTION_INSERT);
                intent.setType(ContactsContract.Contacts.CONTENT_TYPE);
                intent.putExtra(ContactsContract.Intents.Insert.PHONE,phoneNumber);
                startActivity(intent);
            }
        });
    }
    public void inputNumber(View V){
        Button btn=(Button)V;
        String digit=btn.getText().toString();
        String phoneNumber=phoneNumberEditText.getText().toString();
        phoneNumberEditText.setText(phoneNumber +digit);
    }
}
```

Output:



PROGRAM 8. Write a program to enter Medicine Name, Date and Time of the Day as input from the user and store it in the SQLite database. Input for Time of the Day should be either Morning or Afternoon or Evening or Night. Trigger an alarm based on the Date and Time of the Day and display the Medicine Name.

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.andr
oid.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:layout_marginTop="80dp"
android:text="Medicine Database"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

<TextView
android:id="@+id/textView3"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="20dp"
android:text="Medicine Name"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="@+id/txt_medicine_name" />
```

```
    android:id="@+id/textView4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:text="Date"
    app:layout_constraintBottom_toBottomOf="@+id/txt_date"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/txt_medicine_name" />

    <TextView
    android:id="@+id/textView5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:text="Time"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="@+id/txt_time" />

    <EditText
    android:id="@+id/txt_medicine_name"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="50dp"
    android:ems="10"
    android:inputType="textPersonName"
    app:layout_constraintStart_toEndOf="@+id/textView3"
    app:layout_constraintTop_toBottomOf="@+id/textView2" />

    <EditText
    android:id="@+id/txt_date"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="15dp"
    android:ems="10"
    android:inputType="textPersonName"
    app:layout_constraintStart_toStartOf="@+id/txt_medicine_name"
    app:layout_constraintTop_toBottomOf="@+id/txt_medicine_name" />

    <EditText
    android:id="@+id/txt_time"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="20dp"
    android:ems="10"
    android:inputType="textPersonName"
    app:layout_constraintStart_toStartOf="@+id/txt_date"
    app:layout_constraintTop_toBottomOf="@+id/txt_date" />

    <Button
    android:id="@+id/btn_save"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="50dp"
    android:text="Save"
    app:layout_constraintStart_toStartOf="@+id/txt_time"
    app:layout_constraintTop_toBottomOf="@+id/txt_time" />
```

```
<Button
android:id="@+id/btn_show"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="50dp"
android:text="Show"
app:layout_constraintEnd_toEndOf="@+id/txt_time"
app:layout_constraintTop_toBottomOf="@+id/txt_time" />

<TextView
android:id="@+id/lbl_data"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="50dp"
android:text="Data"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/btn_save" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MyDatabase.java

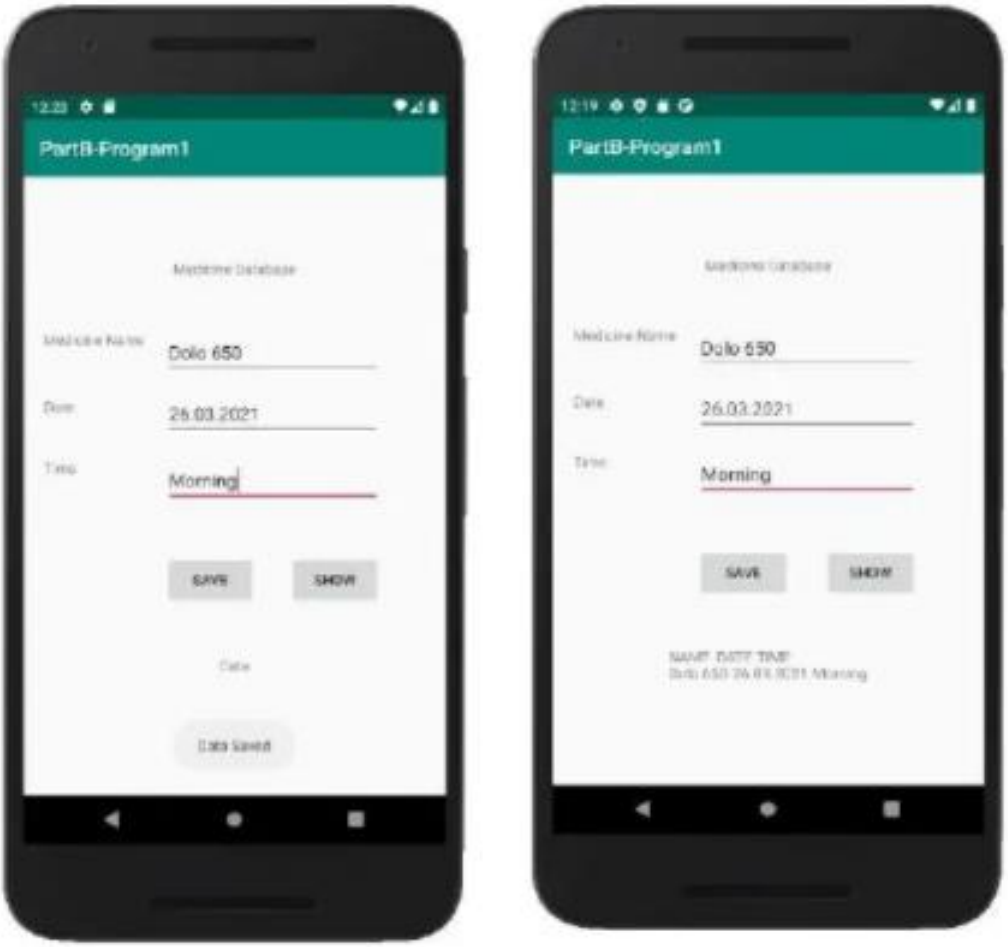
```
package com.example.partb_program1;

import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

import androidx.annotation.Nullable;

public class MyDatabaseextends SQLiteOpenHelper {

public static String DATABASE_NAME="medicine.db";

public MyDatabase(@Nullable Context context, @Nullable String name, @Nullable
SQLiteDatabase.CursorFactory factory, int version) {
super(context, name, factory, version);
    }

@Override
public void onCreate(SQLiteDatabasedb) {

db.execSQL("CREATE TABLE MEDICINE_NAMES (NAME TEXT,MDATE TEXT,MTIME TEXT)");

    }

@Override
public void onUpgrade(SQLiteDatabasedb, int oldVersion, int newVersion) {

    }
}
```

MainActivity.java

```
package com.example.partb_program1;

import androidx.appcompat.app.AppCompatActivity;

import android.content.ContentValues;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import org.w3c.dom.Text;

public class MainActivityextends AppCompatActivityimplements View.OnClickListener {

EditTexttxtMedicineName,txtDate,txtTime;
    Button btnSave,btnShow;
TextViewlblData;

MyDatabasemyDatabase;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
txtMedicineName=(EditText)findViewById(R.id.txt_medicine_name);
txtDate=(EditText)findViewById(R.id.txt_date);
txtTime=(EditText)findViewById(R.id.txt_time);

btnSave=(Button)findViewById(R.id.btn_save);
btnSave.setOnClickListener(this);
btnShow=(Button)findViewById(R.id.btn_show);
btnShow.setOnClickListener(this);
lblData=(TextView)findViewById(R.id.lbl_data);

myDatabase=new MyDatabase(getBaseContext(),
MyDatabase.DATABASE_NAME,null,1);

}

public void onClick(View v)
{
if(v.equals(btnSave))
{
String medicineName= txtMedicineName.getText().toString();
String date=txtDate.getText().toString();
String time=txtTime.getText().toString();

SQLiteDatabase database=myDatabase.getWritableDatabase();
ContentValues cv=new ContentValues();
cv.put("NAME",medicineName);
cv.put("MDATE",date);
cv.put("MTIME",time);
```

```
database.insert("MEDICINE_NAMES",null,cv);
Toast.makeText(getBaseContext(),"Data Saved",Toast.LENGTH_LONG).show();
}
else if(v.equals(btnShow))
{

SQLiteDatabase database=myDatabase.getReadableDatabase();
Cursor cursor= database.query("MEDICINE_NAMES",
new String[]{"NAME","MDATE","MTIME"},null,null,null,null,null);
lblData.setText("NAME\tDATE\tTIME\n");
while(cursor.moveToNext())
{
lblData.append(cursor.getString(0)+"\t");
lblData.append(cursor.getString(1)+"\t");
lblData.append(cursor.getString(2)+"\n");
        }
      }
   }
}
```

Sample Output



PROGRAM 9

Develop a content provider application with an activity called “Meeting Schedule” which takes Date, Time and Meeting Agenda as input from the user and store this information into the SQLite database. Create another application with an activity called “Meeting Info” having Date Picker control, which on the selection of a date should display the Meeting Agenda information for that particular date, else it should display a toast message saying “No Meeting on this Date”.

Program code

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.coordinatorlayout.widget.CoordinatorLayout
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"
tools:context=".MainActivity"
...>
<com.google.android.material.appbar.AppBarLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:theme="@style/Theme.MeetingInfo.AppBarOverlay"
...>
<TextView
android:id="@+id/title"
android:text="Meeting Details"
android:textAppearance="@style/TextAppearance.Widget.AppCompat.Toolbar.Title"
.../>
<com.google.android.material.tabs.TabLayout
android:id="@+id/tabs"
android:layout_width="match_parent"
... />
</com.google.android.material.appbar.AppBarLayout>
<androidx.viewpager.widget.ViewPager
android:id="@+id/view_pager"
app:layout_behavior="@string/appbar_scrolling_view_behavior"
...>
<TextView
android:id="@+id/textView"
android:text="TextView"
.../>
</androidx.viewpager.widget.ViewPager>
</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

fragment_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:id="@+id/constraintLayout"
tools:context=".main.PlaceholderFragment"
...>
<TextView
android:id="@+id/section_label"
android:text="Schedule Meeting"
... />
</androidx.constraintlayout.widget.ConstraintLayout>
```

fragment_layout1.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"
...>
```

```
<EditText
android:id="@+id/txtDate"
android:hint="DD/MM/YYYY"
android:inputType="textPersonName"
... />
<EditText
android:id="@+id/txtTime"
android:hint="hh:mm"
android:inputType="textPersonName"
... />
<TextView
android:id="@+id/mDate"
android:text="Date:"
android:textAppearance="@style/TextAppearance.AppCompat.Large"
... />

 <TextView
android:id="@+id/txt2"
android:text="Time:"
android:textAppearance="@style/TextAppearance.AppCompat.Large"
.../>
<TextView
android:id="@+id/txt3"
android:text="Meeting Agenda:"
... />
<Button
android:id="@+id/btn1"
android:text="Add Meeting Schedule"
.../>
<EditText
android:id="@+id/txtAgenda"
android:inputType="textPersonName"
... />
<CalendarView
android:id="@+id/mCal"
.../>
</androidx.constraintlayout.widget.ConstraintLayout>
```

fragment2_ layout.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"
...>
<TextView
android:id="@+id/textView2"
android:text="Select Date to get Meeting Details"
.../>

 <EditText
android:id="@+id/editTextDate"
android:inputType="text"
... />
<CalendarView
android:id="@+id/calendarView"
app:layout_constraintTop_toBottomOf="@+id/editTextDate"
.../>
<Button
android:id="@+id/btn2"
android:text="Search to get Meeting Details"
... />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.android.meetingschedule;
import android.os.Bundle;
import com.android.meetingschedule.main.SectionsPagerAdapter;
import com.google.android.material.tabs.TabLayout;
import androidx.viewpager.widget.ViewPager;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
SectionsPagerAdapter sectionsPagerAdapter = new SectionsPagerAdapter(this,
getSupportFragmentManager());
ViewPager viewPager = findViewById(R.id.view_pager);
viewPager.setAdapter(sectionsPagerAdapter);
TabLayout tabs = findViewById(R.id.tabs);
tabs.setupWithViewPager(viewPager);

}
}
Fragment1.java
package com.android.meetingschedule;
import android.content.Context;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.view.inputmethod.InputMethodManager;
import android.widget.Button;
import android.widget.CalendarView;
import android.widget.EditText;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;
public class Fragment1 extends Fragment {
EditText date,time,agenda;
DataBaseConn dbc;
CalendarView calendarView;
Button btn;
@Nullable
@Override
public View onCreateView(@NonNull LayoutInflater inflater, @Nullable
ViewGroup
container, @Nullable Bundle savedInstanceState) {
View view=inflater.inflate(R.layout.fragment_layout1,container,false);
date=view.findViewById(R.id.txtDate);
time=view.findViewById(R.id.txtTime);
agenda=view.findViewById(R.id.txtAgenda);
btn=view.findViewById(R.id.btn1);
calendarView=view.findViewById(R.id.mCal);
dbc=new DataBaseConn(getActivity()); //need to initialize here only
calendarView.setVisibility(View.INVISIBLE);
date.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
```

```
closeKeyBoard();
calendarView.setVisibility(View.VISIBLE);
calendarView.setOnDateChangeListener(new
CalendarView.OnDateChangeListener() {
@Override
public void onSelectedDayChange(@NonNull CalendarView view, int year, int
month, int dayOfMonth) {
String d=dayOfMonth+"/"+(month+1)+"/"+year;
date.setText(d);
calendarView.setVisibility(View.INVISIBLE);
}
});
}
});
btn.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
String mdate,mTime,mAgenda;
mdate=date.getText().toString();
mTime=time.getText().toString();
mAgenda=agenda.getText().toString();
Boolean insert=dbc.insertvalue(mdate,mTime,mAgenda);
if(insert==true){
Toast.makeText(getActivity(),"Data Inserted",Toast.LENGTH_SHORT).show();
}
else
Toast.makeText(getActivity(),"Data NOT
Inserted",Toast.LENGTH_SHORT).show();


}
});
return view;
}
private void closeKeyBoard(){
View view = getActivity().getCurrentFocus();
if (view != null) {
InputMethodManager imm = (InputMethodManager)
getActivity().getSystemService(Context.INPUT_METHOD_SERVICE);
imm.hideSoftInputFromWindow(view.getWindowToken(), 0);
}
}
}
```

Fragment2.java

```
package com.android.meetingschedule;
import android.database.Cursor;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.CalendarView;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;
public class Fragment2 extends Fragment {
EditText date;
CalendarView cal;
Button btn1;
DataBaseConn dbc;
TextView t;
```

```
@Nullable
@Override
public View onCreateView(@NonNull LayoutInflater inflater, @Nullable
ViewGroup
container, @Nullable Bundle savedInstanceState) {
View view=inflater.inflate(R.layout.fragment2_layout,container,false);
date=view.findViewById(R.id.editTextDate);
cal=view.findViewById(R.id.calendarView);
btn1=view.findViewById(R.id.btn2);
dbc=new DataBaseConn(getActivity());
cal.setOnDateChangeListener(new CalendarView.OnDateChangeListener() {
@Override
public void onSelectedDayChange(@NonNull CalendarView view, int year, int
month, int dayOfMonth) {
String d=dayOfMonth+"/"+(month+1)+"/"+year;
date.setText(d);
}
});
btn1.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
String d1=date.getText().toString();
StringBuffer res=new StringBuffer();
Cursor c=dbc.fetch(d1);
int count=c.getCount();
c.moveToFirst();
if(count>0) {
do {
res.append(c.getString(c.getColumnIndex("agenda"))+"\t"+"at"+"\t"+c.getString
(c.getColum
nIndex("time")));
res.append("\n");
}while (c.moveToNext());

Toast.makeText(getActivity(), res, Toast.LENGTH_LONG).show();
}
else
{
Toast.makeText(getActivity(), "No Meeting on This Day....",
Toast.LENGTH_LONG).show();
}
}
});
return view;
}
@Override
public void onCreate(@Nullable Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
}
}
```

DBMS.java

```
package com.android.meetingschedule;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;
public class DBMS extends SQLiteOpenHelper {
public DBMS(@Nullable Context context, @Nullable String name, @Nullable
SQLiteDatabase.CursorFactory factory, int version) {
super(context, name, factory, version);
}
```

```
@Override
public void onCreate(SQLiteDatabase db) {
}
@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {


}
}
```

DataBaseConn.java

```
package com.android.meetingschedule;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
public class DataBaseConn extends SQLiteOpenHelper {
public DataBaseConn(Context context) {
super(context,"MeetingDB.db",null,1);
}
@Override
public void onCreate(SQLiteDatabase db) {
db.execSQL("create Table meetingTbl(date TEXT,time TEXT, agenda TEXT)");
}
@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
db.execSQL("drop Table if exists meetingTbl");
}
public boolean insertvalue(String d, String t, String agd){
SQLiteDatabase DB=this.getWritableDatabase();
ContentValues cv = new ContentValues();
cv.put("date",d);
cv.put("time",t);
cv.put("agenda",agd);
long res=DB.insert("meetingTbl",null,cv); //query to insert
if(res==-1){
return false;
}
else

return true;
}
public Cursor fetch(String d){
SQLiteDatabase DB=this.getReadableDatabase();
Cursor c = DB.rawQuery("Select time,agenda from meetingTbl where date='"+d+"'
",null);
return c;
}
}
```

PageViewModel.java

```
package com.android.meetingschedule.main;
import androidx.arch.core.util.Function;
import androidx.lifecycle.LiveData;
import androidx.lifecycle.MutableLiveData;
import androidx.lifecycle.Transformations;
import androidx.lifecycle.ViewModel;
public class PageViewModel extends ViewModel {
private MutableLiveData<Integer> mIndex = new MutableLiveData<>();
private LiveData<String> mText = Transformations.map(mIndex, new
Function<Integer,
String>() {
```

```
@Override
public String apply(Integer input) {
return "Hello world from section: " + input;
}
});
public void setIndex(int index) {
mIndex.setValue(index);
}
public LiveData<String> getText() {
return mText;

}

}
```

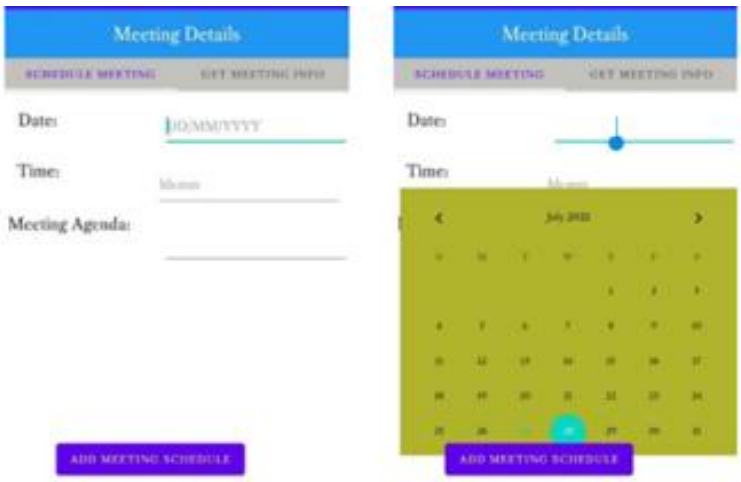
PlaceholderFragment.java

```
package com.android.meetingschedule.main;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;
import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;
import androidx.lifecycle.Observer;
import androidx.lifecycle.ViewModelProvider;
import com.android.meetingschedule.R;
public class PlaceholderFragment extends Fragment {
private static final String ARG_SECTION_NUMBER = "section_number";
private PageViewModel pageViewModel;
public static PlaceholderFragment newInstance(int index) {
PlaceholderFragment fragment = new PlaceholderFragment();
Bundle bundle = new Bundle();
bundle.putInt(ARG_SECTION_NUMBER, index);
fragment.setArguments(bundle);
return fragment;
}
@Override
public void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
pageViewModel = new ViewModelProvider(this).get(PageViewModel.class);
int index = 1;
if (getArguments() != null) {




index = getArguments().getInt(ARG_SECTION_NUMBER);
}
pageViewModel.setIndex(index);
}
@Override
public View onCreateView(
@NonNull LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) {
View root = inflater.inflate(R.layout.fragment_main, container, false);
final TextView textView = root.findViewById(R.id.section_label);
pageViewModel.getText().observe(PlaceholderFragment.this, new
Observer<String>()
{
@Override
public void onChanged(@Nullable String s) {
```

```
textView.setText(s);
}
});
return root;
}
}
```

SectionsPagerAdapter.java

```
package com.android.meetingschedule.main;
import android.content.Context;
import androidx.annotation.Nullable;
import androidx.annotation.StringRes;
import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentManager;
import androidx.fragment.app.FragmentPagerAdapter;
import com.android.meetingschedule.Fragment1;
import com.android.meetingschedule.Fragment2;
import com.android.meetingschedule.R;


public class SectionsPagerAdapter extends FragmentPagerAdapter {
@StringRes
private static final int[] TAB_TITLES = new int[]{R.string.tab_text_1,
R.string.tab_text_2};
private final Context mContext;
public SectionsPagerAdapter(Context context, FragmentManager fm) {
super(fm);
mContext = context;
}
@Override
public Fragment getItem(int position) {
Fragment fragment=null;
switch (position){
case 0:
fragment=new Fragment1();
break;
case 1:
fragment=new Fragment2();
break;
}
return fragment;
}
@Nullable
@Override
public CharSequence getPageTitle(int position) {
return mContext.getResources().getString(TAB_TITLES[position]);
}
@Override
public int getCount() {
return 2;
}
}
```



PROGRAM 10

Create an application to receive an incoming SMS, which is notified to the user. On clicking this SMS notification, the message content and the number should be displayed on the screen. Use appropriate emulator control to send the SMS message to your application.

```
<?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:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context="MainActivity">

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Sending SMS Example"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:textSize="30dp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Tutorials point "
        android:textColor="#ff87ff09"
        android:textSize="30dp"
        android:layout_below="@+id/textView1"
        android:layout_alignRight="@+id/imageButton"
        android:layout_alignEnd="@+id/imageButton" />

    <ImageButton
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/imageButton"
        android:src="@drawable/abc"
        android:layout_below="@+id/textView2"
        android:layout_centerHorizontal="true" />

    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/editText"
        android:hint="Enter Phone Number"
        android:phoneNumber="true"
        android:textColorHint="@color/abc_primary_text_material_dark"
        android:layout_below="@+id/imageButton"
        android:layout_centerHorizontal="true" />

    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/editText2"
        android:layout_below="@+id/editText"
        android:layout_alignLeft="@+id/editText"
        android:layout_alignStart="@+id/editText"
        android:textColorHint="@color/abc_primary_text_material_dark"
        android:layout_alignRight="@+id/imageButton"
```

```
      android:layout_alignEnd="@+id/imageButton"
      android:hint="Enter SMS" />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Send Sms"
      android:id="@+id/btnSendSMS"
      android:layout_below="@+id/editText2"
      android:layout_centerHorizontal="true"
      android:layout_marginTop="48dp" />

</RelativeLayout>
```

MainActivity.java

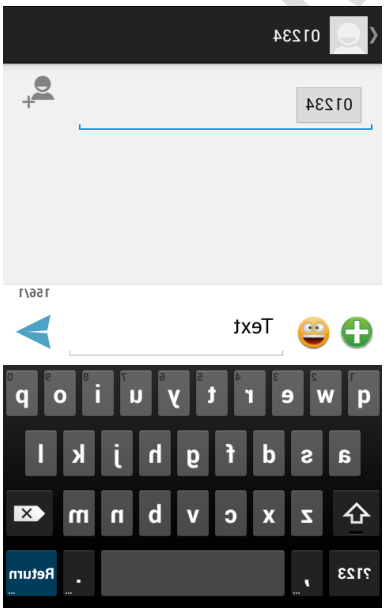
```
package com.partb.smsexp;

import android.Manifest;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.app.Activity;

import android.support.v4.app.ActivityCompat;
import android.support.v4.content.ContextCompat;
import android.telephony.SmsManager;

import android.util.Log;
import android.view.Menu;
import android.view.View;

import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends Activity {
   private static final int MY_PERMISSIONS_REQUEST_SEND_SMS =0 ;
   Button sendBtn;
   EditText txtphoneNo;
   EditText txtMessage;
   String phoneNo;
   String message;

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

      sendBtn = (Button) findViewById(R.id.btnSendSMS);
      txtphoneNo = (EditText) findViewById(R.id.editText);
      txtMessage = (EditText) findViewById(R.id.editText2);

      sendBtn.setOnClickListener(new View.OnClickListener() {
         public void onClick(View view) {
            sendSMSMessage();
         }
      });
```

```
    }

    protected void sendSMSMessage() {
        phoneNo = txtphoneNo.getText().toString();
        message = txtMessage.getText().toString();

        if (ContextCompat.checkSelfPermission(this,
            Manifest.permission.SEND_SMS)
            != PackageManager.PERMISSION_GRANTED) {
                if
(ActivityCompat.shouldShowRequestPermissionRationale(this,
                    Manifest.permission.SEND_SMS)) {
                } else {
                    ActivityCompat.requestPermissions(this,
                        new String[]{Manifest.permission.SEND_SMS},
                        MY_PERMISSIONS_REQUEST_SEND_SMS);
                }
        }
    }

    @Override
    public void onRequestPermissionsResult(int requestCode,String
permissions[], int[] grantResults) {
        switch (requestCode) {
            case MY_PERMISSIONS_REQUEST_SEND_SMS: {
                if (grantResults.length > 0
                    && grantResults[0] ==
PackageManager.PERMISSION_GRANTED) {
                    SmsManager smsManager = SmsManager.getDefault();
                    smsManager.sendTextMessage(phoneNo, null,
message, null, null);
                    Toast.makeText(getApplicationContext(), "SMS
sent.",
                            Toast.LENGTH_LONG).show();
                } else {
                    Toast.makeText(getApplicationContext(),
                    "SMS faild, please try again.",
Toast.LENGTH_LONG).show();
                    return;
                }
            }
        }

    }
}
```

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

    <application
        android:allowBackup="true"
```

```
        android:icon="@drawable/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme" >

        <activity
            android:name="com.partb.smsexp.MainActivity"
            android:label="@string/app_name" >

            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>

        </activity>

    </application>
</manifest>
```


OUTPUT



PROGRAM 11:

Write a program to create an activity having a Text box, and also Save, Open and Create buttons. The user has to write some text in the Text box. On pressing the Create button the text should be saved as a text file in SDcard. On subsequent changes to the text, the Save button should be pressed to store the latest content to the same file. On pressing the Open button, it should display the contents from the previously stored files in the Text box. If the user tries to save the contents in the Textbox to a file without creating it, then a toast message has to be displayed saying "First Create a File"

Activity_main.xml

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

...>
<Button
android:id="@+id/create"
android:layout_gravity="center_horizontal"
android:text="create"
.../>
<EditText
android:id="@+id/etText"
android:layout_marginTop="20dp"
... >
<requestFocus>
</requestFocus>
</EditText>
<LinearLayout
android:id="@+id/linearLayout1"
android:orientation="horizontal"
... >
<Button
android:id="@+id/btnSave"
android:text="Save"
```

```
...>
</Button>
<Button
android:id="@+id/btnLoad"
android:text="Load"
...>
</Button>
</LinearLayout>
</LinearLayout>
```

MainActivity.java

```
package com.android.sharedpreferences;
import android.app.Activity;
import android.content.SharedPreferences;
import android.content.SharedPreferences.Editor;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity extends Activity implements OnClickListener {
EditText etText;
Button btnSave, btnLoad,btcreate;
SharedPreferences sPref;
final String SAVED_TEXT = "saved_text";
@Override
public void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
etText = (EditText) findViewById(R.id.etText);
btnSave = (Button) findViewById(R.id.btnSave);
btnSave.setOnClickListener(this);
btnLoad = (Button) findViewById(R.id.btnLoad);
btcreate=(Button) findViewById(R.id.create);
btcreate.setOnClickListener(this);
btnLoad.setOnClickListener(this);
loadText();
}
@Override
public void onClick(View v) {
switch (v.getId()) {
case R.id.btnSave:
saveText();
break;
case R.id.create:
createtext();
break;
case R.id.btnLoad:
loadText();
break;
default:
break;
}
}
void createtext() {
sPref = getPreferences(MODE_PRIVATE);
Editor ed = sPref.edit();
ed.putString(SAVED_TEXT, etText.getText().toString());
ed.commit();
Toast.makeText(this, "Text created", Toast.LENGTH_SHORT).show();
}
void saveText() {
```

```
if (etText!=null){
sPref = getPreferences(MODE_PRIVATE);
Editor ed = sPref.edit();
ed.putString(SAVED_TEXT, etText.getText().toString());
ed.commit();
Toast.makeText(this, "Text saved", Toast.LENGTH_SHORT).show();
}
else {
Toast.makeText(this, "first create the file", Toast.LENGTH_SHORT).show();
}
}
void loadText() {
sPref = getPreferences(MODE_PRIVATE);
String savedText = sPref.getString(SAVED_TEXT, "");
etText.setText(savedText);
Toast.makeText(this, "Text Opened", Toast.LENGTH_SHORT).show();

}
@Override
protected void onDestroy() {
super.onDestroy();
saveText();
}
}
```


OUTPUT:

PROGRAM 12:

Create an application to demonstrate a basic media player that allows the user to Forward, Backward, Play and Pause an audio. Also, make use of the indicator in the seek bar to move the audio forward or backward as required.

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:paddingLeft="@dimen/activity_horizontal_margin"
   android:paddingRight="@dimen/activity_horizontal_margin"
   android:paddingTop="@dimen/activity_vertical_margin"
   android:paddingBottom="@dimen/activity_vertical_margin"
tools:context=".MainActivity">

   <TextView android:text="Music Palyer"
android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:id="@+id/textview"
      android:textSize="35dp"
      android:layout_alignParentTop="true"
      android:layout_centerHorizontal="true" />
```

```
<Button
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="@string/forward"
   android:id="@+id/button"
   android:layout_alignParentBottom="true"
   android:layout_alignParentLeft="true"
   android:layout_alignParentStart="true" />

<Button
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="@string/pause"
   android:id="@+id/button2"
   android:layout_alignParentBottom="true"
   android:layout_alignLeft="@+id/imageView"
   android:layout_alignStart="@+id/imageView" />

<Button
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="@string/back"
   android:id="@+id/button3"
   android:layout_alignTop="@+id/button2"
   android:layout_toRightOf="@+id/button2"
   android:layout_toEndOf="@+id/button2" />

<Button
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="@string/rewind"
   android:id="@+id/button4"
   android:layout_alignTop="@+id/button3"
   android:layout_toRightOf="@+id/button3"
   android:layout_toEndOf="@+id/button3" />

<SeekBar
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:id="@+id/seekBar"
   android:layout_alignLeft="@+id/textview"
   android:layout_alignStart="@+id/textview"
   android:layout_alignRight="@+id/textview"
   android:layout_alignEnd="@+id/textview"
   android:layout_above="@+id/button" />

<TextView
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:textAppearance="?android:attr/textAppearanceSmall"
   android:text="Small Text"
   android:id="@+id/textView2"
   android:layout_above="@+id/seekBar"
   android:layout_toLeftOf="@+id/textView"
   android:layout_toStartOf="@+id/textView" />
```

```
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceSmall"
        android:text="Small Text"
        android:id="@+id/textView3"
        android:layout_above="@+id/seekBar"
        android:layout_alignRight="@+id/button4"
        android:layout_alignEnd="@+id/button4" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textAppearance="?android:attr/textAppearanceMedium"
        android:text="Medium Text"
        android:id="@+id/textView4"
        android:layout_alignBaseline="@+id/textView2"
        android:layout_alignBottom="@+id/textView2"
        android:layout_centerHorizontal="true" />

</RelativeLayout>
```

JAVA CODE:

```
package com.partb.mediaplayer;

import android.app.Activity;
import android.media.MediaPlayer;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;

import android.widget.Button;
import android.widget.ImageView;
import android.widget.SeekBar;
import android.widget.TextView;
import android.widget.Toast;
import java.util.concurrent.TimeUnit;


public class MainActivity extends Activity {
    private Button b1,b2,b3,b4;
    private ImageView iv;
    private MediaPlayer mediaPlayer;

    private double startTime = 0;
    private double finalTime = 0;

    private Handler myHandler = new Handler();;
    private int forwardTime = 5000;
    private int backwardTime = 5000;
    private SeekBar seekbar;
    private TextView tx1,tx2,tx3;
```

```
    public static int oneTimeOnly = 0;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        b1 = (Button) findViewById(R.id.button);
        b2 = (Button) findViewById(R.id.button2);
        b3 = (Button)findViewById(R.id.button3);
        b4 = (Button)findViewById(R.id.button4);
        iv = (ImageView)findViewById(R.id.imageView);

        tx1 = (TextView)findViewById(R.id.textView2);
        tx2 = (TextView)findViewById(R.id.textView3);
        tx3 = (TextView)findViewById(R.id.textView4);
        tx3.setText("Song.mp3");

        mediaPlayer = MediaPlayer.create(this, R.raw.song);
        seekbar = (SeekBar)findViewById(R.id.seekBar);
        seekbar.setClickable(false);
        b2.setEnabled(false);

        b3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Toast.makeText(getApplicationContext(), "Playing
                    sound",Toast.LENGTH_SHORT).show();
                mediaPlayer.start();

                finalTime = mediaPlayer.getDuration();
                startTime = mediaPlayer.getCurrentPosition();

                if (oneTimeOnly == 0) {
                    seekbar.setMax((int) finalTime);
                    oneTimeOnly = 1;
                }

                tx2.setText(String.format("%d min, %d sec",
                    TimeUnit.MILLISECONDS.toMinutes((long) finalTime),
                    TimeUnit.MILLISECONDS.toSeconds((long) finalTime) -

TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS.toMinutes((long)
                        finalTime)))
                );

                tx1.setText(String.format("%d min, %d sec",
                    TimeUnit.MILLISECONDS.toMinutes((long) startTime),
                    TimeUnit.MILLISECONDS.toSeconds((long) startTime) -

TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS.toMinutes((long)
                        startTime)))
                );

                seekbar.setProgress((int)startTime);
                myHandler.postDelayed(UpdateSongTime,100);
```

```
            b2.setEnabled(true);
            b3.setEnabled(false);
        }
    });

    b2.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            Toast.makeText(getApplicationContext(), "Pausing
                sound",Toast.LENGTH_SHORT).show();
            mediaPlayer.pause();
            b2.setEnabled(false);
            b3.setEnabled(true);
        }
    });

    b1.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            int temp = (int)startTime;

            if((temp+forwardTime)<=finalTime){
                startTime = startTime + forwardTime;
                mediaPlayer.seekTo((int) startTime);
                Toast.makeText(getApplicationContext(),"You have
Jumped forward 5
                    seconds",Toast.LENGTH_SHORT).show();
            }else{
                Toast.makeText(getApplicationContext(),"Cannot jump
forward 5
                    seconds",Toast.LENGTH_SHORT).show();
            }
        }
    });

    b4.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            int temp = (int)startTime;

            if((temp-backwardTime)>0){
                startTime = startTime - backwardTime;
                mediaPlayer.seekTo((int) startTime);
                Toast.makeText(getApplicationContext(),"You have
Jumped backward 5
                    seconds",Toast.LENGTH_SHORT).show();
            }else{
                Toast.makeText(getApplicationContext(),"Cannot jump
backward 5
                    seconds",Toast.LENGTH_SHORT).show();
            }
        }
    });
}
```

```
   private Runnable UpdateSongTime = new Runnable() {
      public void run() {
         startTime = mediaPlayer.getCurrentPosition();
         tx1.setText(String.format("%d min, %d sec",
            TimeUnit.MILLISECONDS.toMinutes((long) startTime),
            TimeUnit.MILLISECONDS.toSeconds((long) startTime) -
            TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS.
            toMinutes((long) startTime)))
         );
         seekbar.setProgress((int)startTime);
         myHandler.postDelayed(this, 100);
      }
   };
}
```

AndroidManifest.xml

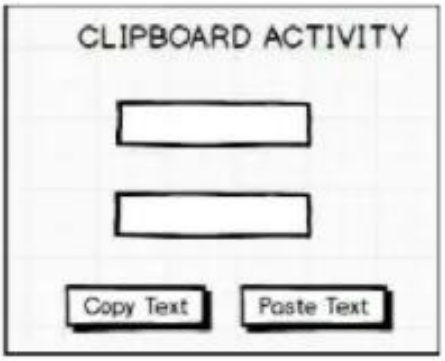
```
<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
   package="com.partb.mediaplayer " >

   <application
      android:allowBackup="true"
      android:icon="@drawable/ic_launcher"
      android:label="@string/app_name"
      android:theme="@style/AppTheme" >

      <activity
         android:name=" com.partb.mediaplayer.MainActivity"
         android:label="@string/app_name" >

         <intent-filter>
            <action android:name="android.intent.action.MAIN" />
            <category
android:name="android.intent.category.LAUNCHER" />
         </intent-filter>

      </activity>

   </application>
</manifest>
```


OUTPUT:

MAP LAB DEMO

PROGRAM 13:

Develop an application that makes use of the clipboard framework for copying and pasting of the text. The activity consists of two EditText controls and two Buttons to trigger the copy and paste functionality.



Design

activity_main.xml

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


<Button
android:id="@+id/btn_create"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="10dp"
android:layout_marginTop="40dp"
android:text="Create"
app:layout_constraintEnd_toStartOf="@+id/textView2"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView2" />

<Button
android:id="@+id/btn_open"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="40dp"
android:layout_marginEnd="10dp"
android:text="Open"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toEndOf="@+id/textView2"
app:layout_constraintTop_toBottomOf="@+id/textView2" />

<TextView
android:id="@+id/textView2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="50dp"
android:text="File Application"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />

<EditText
android:id="@+id/txt_content"
android:layout_width="272dp"
android:layout_height="138dp"
android:layout_marginTop="50dp"
android:ems="10"
android:inputType="textPersonName"
app:layout_constraintTop_toBottomOf="@+id/btn_create"
tools:layout_editor_absoluteX="65dp" />

<Button
android:id="@+id/btn_save"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="50dp"
android:text="Save"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/txt_content" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

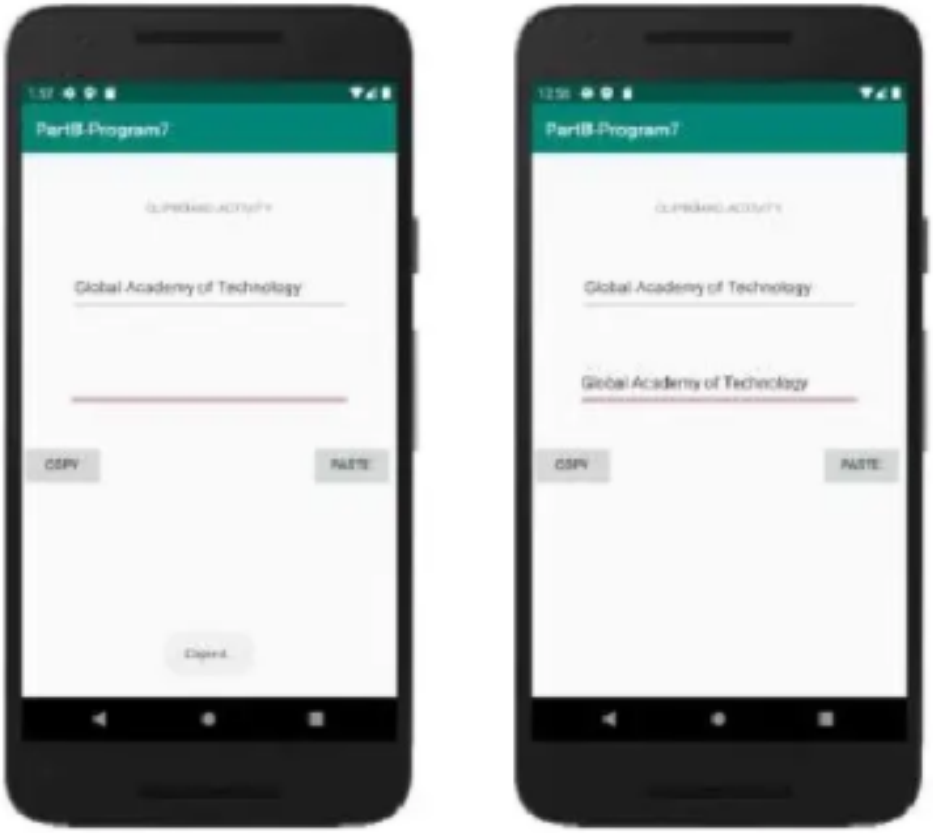
MainActivity.java

```
package com.example.partbprogram7;

import androidx.appcompat.app.AppCompatActivity;
import android.content.ClipData;
import android.content.ClipboardManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivityextends AppCompatActivityimplements View.OnClickListener {
EditTexttxtCopy,txtPaste;
Button btnCopy,btnPaste;

ClipboardManagermyClipboard;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
txtCopy=(EditText)findViewById(R.id.txt_copy);
txtPaste=(EditText)findViewById(R.id.txt_paste);

btnCopy=(Button)findViewById(R.id.btn_copy);
btnCopy.setOnClickListener(this);

btnPaste=(Button)findViewById(R.id.btn_paste);
btnPaste.setOnClickListener(this);

myClipboard= (ClipboardManager)getSystemService(CLIPBOARD_SERVICE);
}

@Override
public void onClick(View v) {
if(v.equals(btnCopy))
{
ClipDatamyClip;
String data = txtCopy.getText().toString();
myClip = ClipData.newPlainText("text", data);
myClipboard.setPrimaryClip(myClip);
Toast.makeText(getBaseContext(),"Copied..",Toast.LENGTH_LONG).show();
}

 else if(v.equals(btnPaste))
 {
 ClipDataabc = myClipboard.getPrimaryClip();
 ClipData.Item item = abc.getItemAt(0);
 txtPaste.setText(item.getText().toString());
      }
   }
 }
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
package="com.example.partbprogram7">

<application
android:allowBackup="true"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:roundIcon="@mipmap/ic_launcher_round"
android:supportsRtl="true"
android:theme="@style/AppTheme">
<activity android:name=".MainActivity">
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>
</application>
</manifest>
```

Sample Output



PROGRAM 14:

Create an AIDL service that calculates Car Loan EMI. The formula to calculate EMI is

$$E = P * (r(1+r)^n)/((1+r)^n-1)$$

where

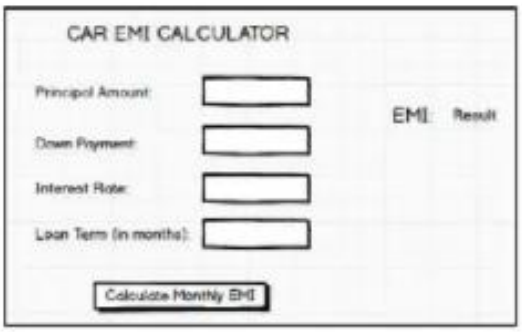
E = The EMI payable on the car loan amount

P = The Car loan Principal Amount

r = The interest rate value computed on a monthly basis

n = The loan tenure in the form of months

The down payment amount has to be deducted from the principal amount paid towards buying theCar. Develop an application that makes use of this AIDL service to calculate the EMI. Thisapplication should have four EditText to read the PrincipalAmount, Down Payment, Interest Rate,Loan Term (in months) and a button named as "Calculate Monthly EMI". On click of this button,the result should be shown in a TextView. Also, calculate the EMI by varying the Loan Term andInterest Rate values.



Design

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.andr
oid.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/lblpayment"
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="EMI CALCULATOR"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
tools:layout_editor_absoluteY="76dp" />

<TextView
android:id="@+id/textView2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="20dp"
android:layout_marginTop="30dp"
android:text="Principal Amount"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/textView" />

<EditText
android:id="@+id/txt_principal"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="10dp"
android:layout_marginTop="30dp"
android:ems="10"
android:inputType="textPersonName"
app:layout_constraintStart_toEndOf="@+id/textView2"
app:layout_constraintTop_toBottomOf="@+id/textView" />

<TextView
android:id="@+id/downpayment"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Down Payment"
app:layout_constraintStart_toStartOf="@+id/textView2"
app:layout_constraintTop_toTopOf="@+id/txt_downnpayment" />

<EditText
android:id="@+id/txt_downnpayment"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="40dp"
android:ems="10"
android:inputType="textPersonName"
app:layout_constraintStart_toStartOf="@+id/txt_principal"
```

```
app:layout_constraintTop_toBottomOf="@+id/txt_principal" />

<TextView
android:id="@+id/textView4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Interest Rate"
app:layout_constraintStart_toStartOf="@+id/downpayment"
app:layout_constraintTop_toTopOf="@+id/txt_interestrate" />


<EditText
android:id="@+id/txt_interestrate"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="40dp"
android:ems="10"
android:inputType="textPersonName"
app:layout_constraintStart_toStartOf="@+id/txt_downnpayment"
app:layout_constraintTop_toBottomOf="@+id/txt_downnpayment" />

<TextView
android:id="@+id/textView5"
android:layout_width="130dp"
android:layout_height="33dp"
android:layout_marginTop="8dp"
android:text="Loan Term (Months)"
app:layout_constraintStart_toStartOf="@+id/textView4"
app:layout_constraintTop_toTopOf="@+id/txt_termmonths" />

<EditText
android:id="@+id/txt_termmonths"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="20dp"
android:layout_marginTop="32dp"
android:ems="10"
android:inputType="textPersonName"
app:layout_constraintStart_toStartOf="@+id/txt_interestrate"
app:layout_constraintTop_toBottomOf="@+id/txt_interestrate" />

<Button
android:id="@+id/btn_calculate"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="30dp"
android:text="Calculate EMI"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/txt_termmonths" />

<TextView
android:id="@+id/lbl_emiamount"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginTop="30dp"
android:text="Emi Amount"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/btn_calculate" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.example.partb_program8;

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;

import java.text.DecimalFormat;
import java.util.logging.SimpleFormatter;

public class MainActivityextends AppCompatActivityimplements View.OnClickListener {

EditTexttxtPrinicple,txtDownPayment,txtInterestRate,txtLoanTerm;

Button btnCalculate;

TextViewlblResult;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
txtPrinicple=(EditText)findViewById(R.id.txt_principal);
txtDownPayment=(EditText)findViewById(R.id.txt_downnpayment);
txtInterestRate=(EditText)findViewById(R.id. txt_interestrate);
txtLoanTerm=(EditText)findViewById(R.id.txt_termmonths);

btnCalculate=(Button)findViewById(R.id.btn_calculate);
btnCalculate.setOnClickListener(this);

lblResult=(TextView)findViewById(R.id.lbl_emiamount);

}

public void onClick(View v)
{
try
{

DecimalFormat formatter = new
DecimalFormat("#0.00");

double prinicipleAmount=
Double.parseDouble(txtPrinicple.
getText().toString());
double downPayment=Double.parseDouble(txtDownPayment.getText().toString());
```

```
prinicipleAmount=prinicipleAmount-downPayment;
double interestRate=Double.parseDouble(txtInterestRate.getText().toString());
interestRate=interestRate/(12*100);
double loanTerm=Double.parseDouble(txtLoanTerm.getText().toString());

double emi=prinicipleAmount*
                    (interestRate*Math.pow((1+interestRate),loanTerm))
                    /(Math.pow((1+interestRate),loanTerm)-1);
lblResult.setText(String.valueOf(formatter.format(emi)));
}

catch(Exception e)
{
Toast.makeText(getBaseContext(),"Invalid Input",Toast.LENGTH_LONG).show();
}
}
}
```

Sample Output