HKBK COLLEGE OF ENGINEERING

(Affiliated to VTU, Belgaum and Approved by AICTE)

DEPARTMENT OF ISE

LABORATORY MANUAL
MOBILE APPLICATION DEVELOPMENT LABORATORY

18CSMP68

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018)

HKBK COLLEGE OF ENGINEERING

(Affiliated to VTU, Belgaum and Approved by AICTE)

DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING

Course outcomes: On the completion of this laboratory course,

The students will be able to:

- Create, test and debug Android application by setting up Android development environment.
- Implement adaptive, responsive user interfaces that work across a wide range of devices.
- Infer long running tasks and background work in Android applications.
- Demonstrate methods in storing, sharing and retrieving data in Android applications.
- Infer the role of permissions and security for Android applications

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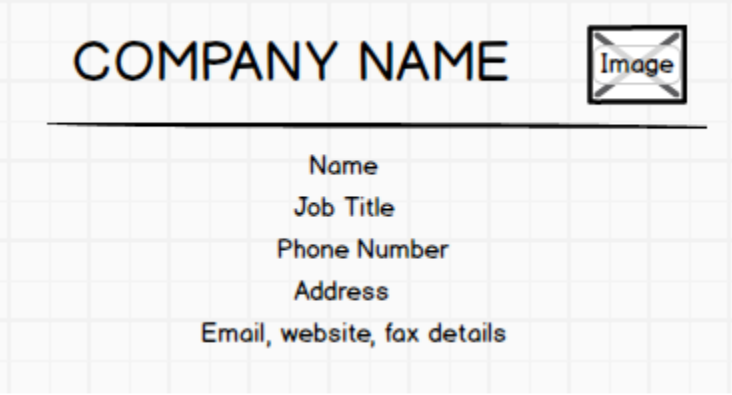
Mapping of Course outcomes to Programme outcomes

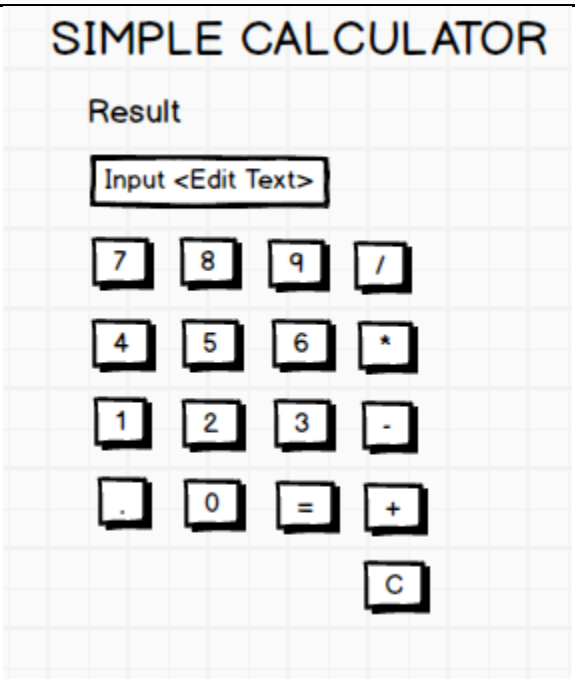
PO / CO	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
1	2	3	3	3	3	-	1	1	2	-	3	2	3	3	2
2	1	2	2	3	3	-	1	1	2	-	3	2	3	3	2
3	1	3	2	3	3	-	1	1	2	-	3	2	3	3	2

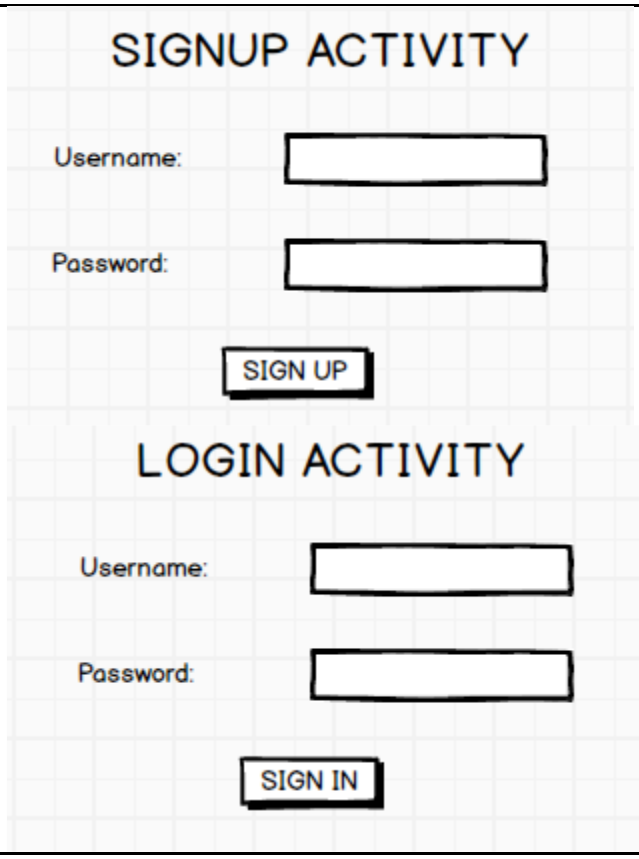
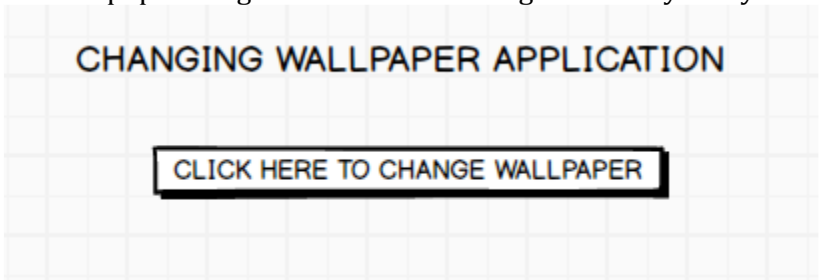
3	- High Correlation
2	- Moderate (Medium) Correlation
1	- Slight (Low) Correlation
-	- No Correlation

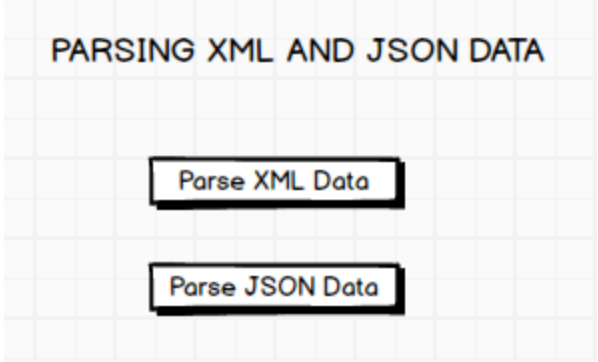
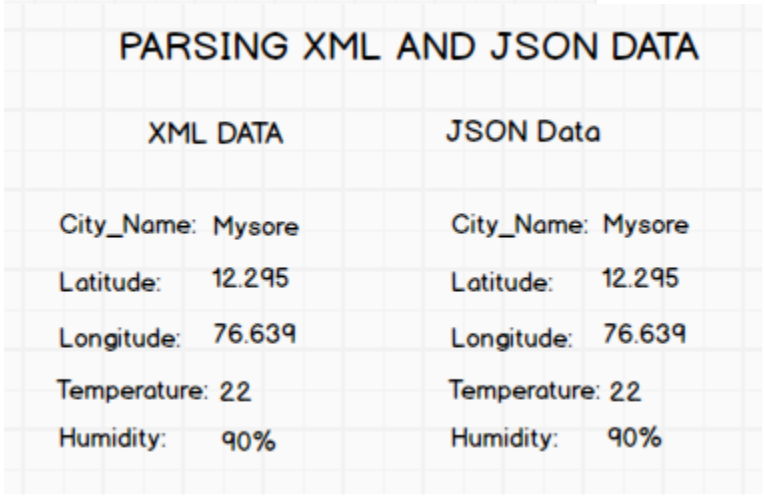
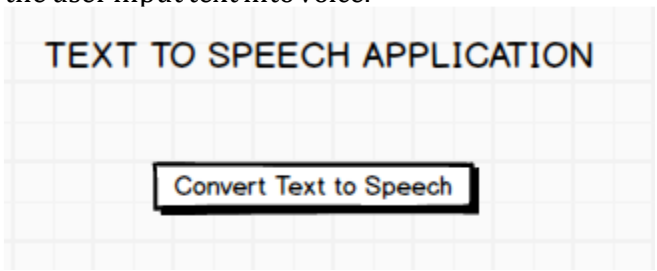
List of Experiments

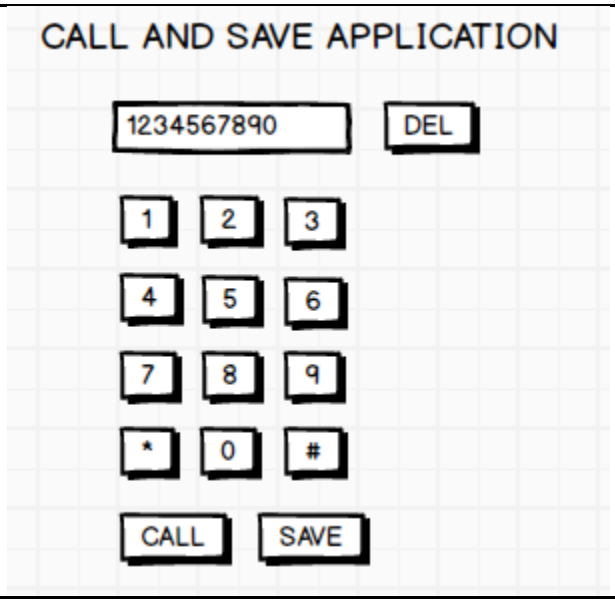
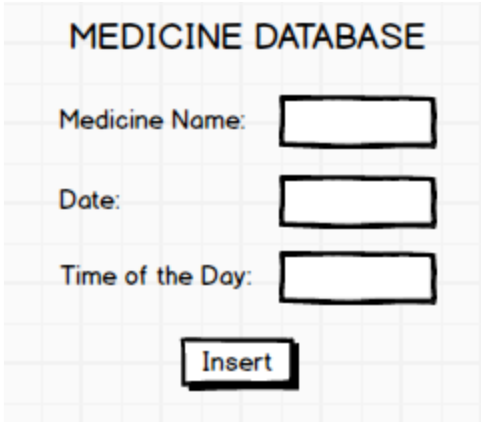
Hours/Week: 04 **Exam Hours: 03**
CIE Marks: 40 **Total Hours: 40**
Semester: 5 **SEE Marks: 100**

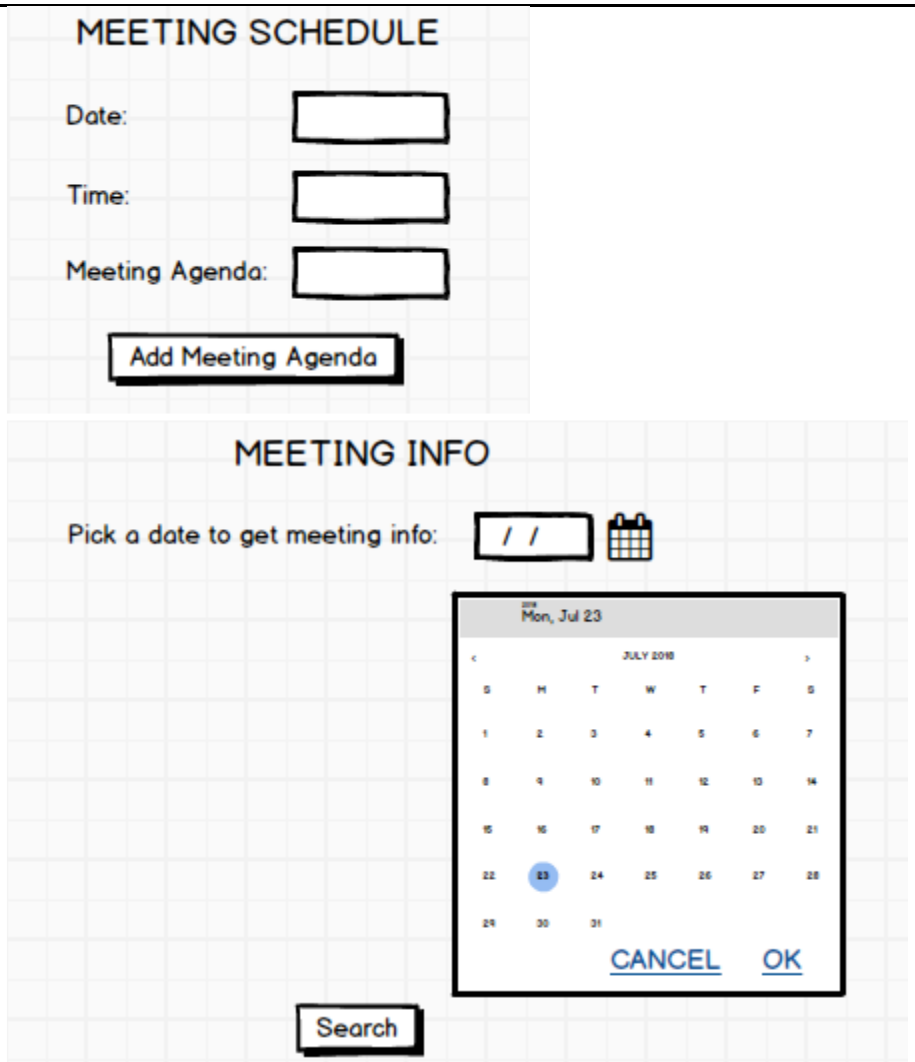
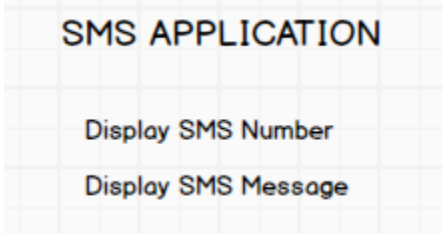
Sl.#	PART A For the experiments below modify the topology and parameters set for the experiment and take multiple rounds of reading and analyze the results available in log files. Plot necessary graphs and conclude using any suitable tool.	Page No.
1.	Create an application to design a Visiting Card. 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
2.	Develop an Android application using controls like Button, Text View, Edit Text for designing a calculator having basic functionality like Addition, Subtraction, Multiplication, and Division.	3

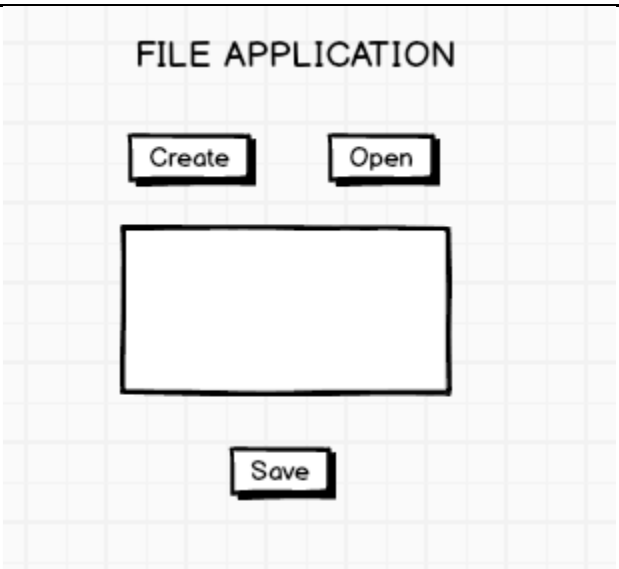
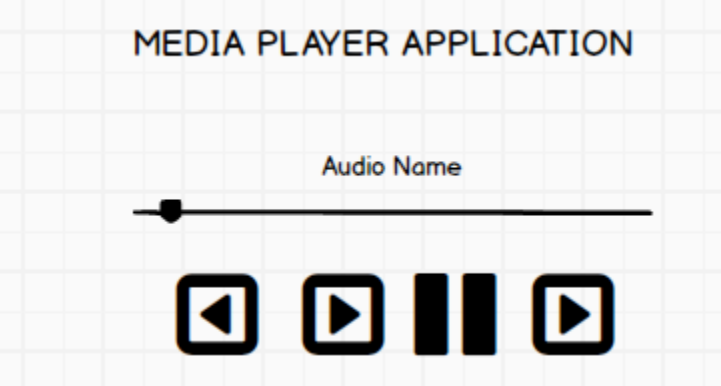
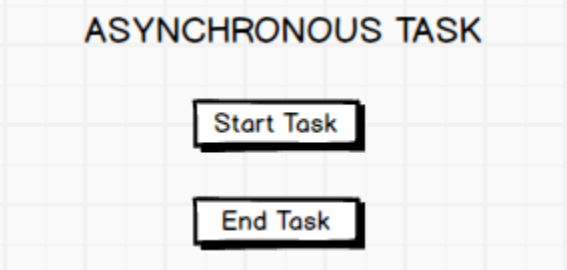
		
3.	Create a SIGN Up activity with Username and Password. Validation of password should happen based on the following rules: • Password should contain uppercase and lowercase letters. • Password should contain letters and numbers. • Password should contain special characters. • Minimum length of the password (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.	19

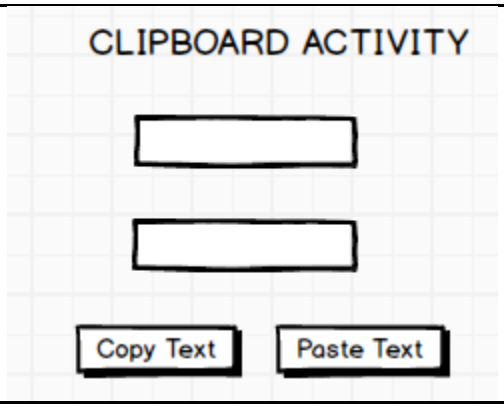
		
4.	Develop an application to set an image as wallpaper. On click of a button, the wallpaper image should start to change randomly every 30 seconds 	23
5.	Write a program to create an activity with two buttons START and STOP. On pressing of the START button, the activity must start the counter by displaying the numbers from One and the counter must keep on counting until the STOP button is pressed. Display the counter value in a Text View control 	25

6.	Create two files of XML and JSON type with values for City Name, Latitude, Longitude, Temperature and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.   	28
7.	Develop a simple application with one Edit Text 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.  	31
8.	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	33

		
	PART B	
1.	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. 	37
2.	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".	39

		
3.	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 	41
4.	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 Mk SD card. 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".	45

		
5.	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. 	48
6.	Develop an application to demonstrate the use of Asynchronous tasks in android. The asynchronous task should implement the functionality of a simple moving banner. On pressing the **Start Task** button, the banner message should scroll from right to left. On pressing the **Stop Task** button, the banner message should stop. Let the banner message be "Demonstration of Asynchronous Task". 	51
7.	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.	57

		
8.	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 Edit Text 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 Text View. Also, calculate the EMI by varying the Loan Term and Interest Rate values.	58

Laboratory Outcomes:

After studying these laboratory programs,

students will be able to

- **Create, test and debug Android application by setting up Android development environment.**
- **Implement adaptive, responsive user interfaces that work across a wide range of devices.**
- **Infer long running tasks and background work in Android applications.**
- **Demonstrate methods in storing, sharing and retrieving data in Android applications.**
- **Infer the role of permissions and security for Android applications.**

Procedure to Conduct Practical Examination

• Experiment distribution

- **For laboratories having only one part: Students are allowed to pick on experiment from the lot with equal opportunity.**
- **For laboratories having PART A and PART B: Students are allowed to pick on experiment from PART A and one experiment from PART B, with equal opportunity.**

• Change of experiment is allowed only once and marks allotted for procedure to be made zero of the changed part only.

• Marks Distribution (Course ed to change in accordance with university regulations)

- **For laboratories having only one part – Procedure + Execution + Viva-Voce: 15+70+15= 100 Marks**
- **For laboratories having PART A and PART B**

i. Part A – Procedure + Execution + Viva = 6 + 28 + 6 = 40 Marks

ii. Part B – Procedure + Execution + Viva = 9 + 42 + 9 = 60 Marks

Text Books:

1. Google Developer Training, "Android Developer Fundamentals Course – Concept

Reference", Google Developer Training Team, 2017.

https://www.gitbook.com/book/google-developer-training/android-developer-fundamentalscourse-concepts/details

(Download pdf file from the above link)

Reference Books:

1. Erik Hellman, "Android Programming – Pushing the Limits", 1st Edition, Wiley India Pvt Ltd,

2014. ISBN-13: 978-8126547197

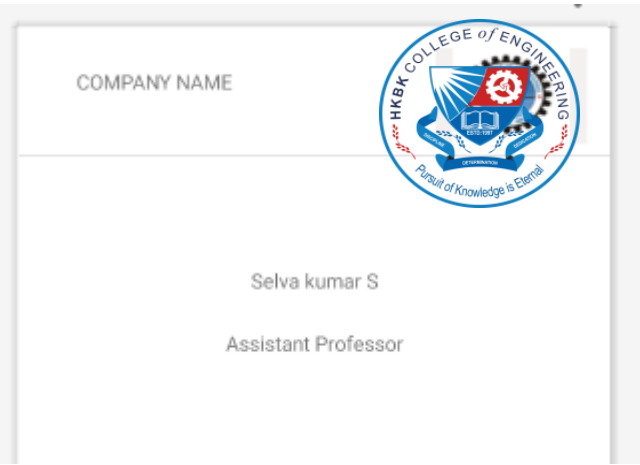
2. Dawn Griffiths and David Griffiths, "Head First Android Development", 1st Edition, O'Reilly

SPD Publishers, 2015. ISBN-13: 978-9352131341

3. Bill Phillips, Chris Stewart and Kristin Marsicano, "Android Programming: The Big Nerd Ranch Guide", 3rd Edition, Big Nerd Ranch Guides, 2017. ISBN-13: 978-0134706054

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.



AndroidManifest.xml

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

    <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/Theme.VisitingCard">
        <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>
```

Activity_main.xml

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="217dp"
        android:layout_height="37dp"
        android:layout_marginStart="40dp"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="24dp"
        android:text="COMPANY NAME"
        app:layout_constraintBottom_toTopOf="@+id/divider"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.121" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="76dp"
        android:text="Selva kumar S"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/divider" />

    <View
        android:id="@+id/divider"
        android:layout_width="match_parent"
        android:layout_height="1dp"
        android:layout_marginTop="88dp"
        android:background="?android:attr/listDivider"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="105dp"
        android:layout_height="66dp"
        android:layout_marginStart="32dp"
        android:layout_marginLeft="32dp"
        android:layout_marginBottom="8dp"
        android:background="#F4F0EF"
        app:layout_constraintBottom_toTopOf="@+id/divider"
```

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.058"
        app:layout_constraintStart_toEndOf="@+id/textView2"
        app:srcCompat="@drawable/bmslogo" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="24dp"
        android:text="Assistant Professor"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

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

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

XML File:

```
<?xml version="1.0" encoding="utf-8"?>

<android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

   xmlns:app="http://schemas.android.com/apk/res-auto"

   xmlns:tools="http://schemas.android.com/tools"

   android:layout_width="match_parent"

   android:layout_height="match_parent"

   tools:context="com.example.a84.calculator.MainActivity">
```

```
<RelativeLayout
    android:layout_width="368dp"
    android:layout_height="495dp"
    android:layout_marginBottom="8dp"
    android:layout_marginEnd="8dp"
    android:layout_marginTop="8dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toTopOf="parent">

    <Button
        android:id="@+id/btn_1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:layout_below="@+id/edText1"
        android:layout_marginTop="60dp"
        android:onClick="PressOne"
        android:text="1"
        android:textSize="18sp" />

    <Button
        android:id="@+id/btn_0"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btn_8"
```

```
    android:layout_toEndOf="@+id/btn_7"
    android:layout_toRightOf="@+id/btn_7"
    android:text="0"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_9"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_6"
    android:layout_toEndOf="@+id/btn_5"
    android:layout_toRightOf="@+id/btn_5"
    android:text="9"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_8"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_5"
    android:layout_toEndOf="@+id/btn_7"
    android:layout_toRightOf="@+id/btn_7"
    android:text="8"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_7"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/btn_4"
    android:layout_alignStart="@+id/btn_4"
    android:layout_below="@+id/btn_4"
    android:text="7"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_6"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBaseline="@+id/btn_5"
    android:layout_alignBottom="@+id/btn_5"
    android:layout_toEndOf="@+id/btn_5"
    android:layout_toRightOf="@+id/btn_5"
    android:text="6"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_5"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btn_2"
    android:layout_toEndOf="@+id/btn_4"
    android:layout_toRightOf="@+id/btn_4"
    android:text="5"
```

```
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/btn_1"
    android:layout_alignStart="@+id/btn_1"
    android:layout_below="@+id/btn_1"
    android:text="4"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignBaseline="@+id/btn_2"
    android:layout_alignBottom="@+id/btn_2"
    android:layout_toEndOf="@+id/btn_2"
    android:layout_toRightOf="@+id/btn_2"
    android:text="3"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
```

```
    android:layout_alignBaseline="@+id/btn_1"
    android:layout_alignBottom="@+id/btn_1"
    android:layout_toEndOf="@+id/btn_1"
    android:layout_toRightOf="@+id/btn_1"
    android:text="2"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Add"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_above="@+id/btn_6"
    android:layout_alignParentEnd="true"
    android:layout_alignParentRight="true"
    android:backgroundTint="@android:color/darker_gray"
    android:text="+"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Sub"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/btn_Add"
    android:layout_alignStart="@+id/btn_Add"
    android:layout_below="@+id/btn_Add"
    android:backgroundTint="@android:color/darker_gray"
```

```
    android:text="-"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Mul"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/btn_Sub"
    android:layout_alignStart="@+id/btn_Sub"
    android:layout_below="@+id/btn_6"
    android:backgroundTint="@android:color/darker_gray"
    android:text="*"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />

<Button
    android:id="@+id/btn_Div"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/btn_Mul"
    android:layout_alignStart="@+id/btn_Mul"
    android:layout_below="@+id/btn_9"
    android:backgroundTint="@android:color/darker_gray"
    android:text="/"
    android:textColor="@android:color/background_light"
    android:textSize="18sp" />
```

```
<EditText
   android:id="@+id/edText1"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_alignParentEnd="true"
   android:layout_alignParentLeft="true"
   android:layout_alignParentRight="true"
   android:layout_alignParentStart="true"
   android:layout_alignParentTop="true"
   android:layout_marginTop="22dp"
   android:ems="10"
   android:inputType="textPersonName"
   android:textAlignment="textEnd"
   android:textSize="24sp" />

<Button
   android:id="@+id/btn_calc"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_below="@+id/btn_0"
   android:layout_toEndOf="@+id/btn_0"
   android:layout_toRightOf="@+id/btn_0"
   android:backgroundTint="@android:color/holo_green_light"
   android:text="="
   android:textColor="@android:color/background_light"
   android:textSize="18sp" />
```

```
    <Button
        android:id="@+id/btn_dec"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btn_7"
        android:layout_toLeftOf="@+id/btn_8"
        android:layout_toStartOf="@+id/btn_8"
        android:text="."
        android:textSize="18sp" />

    <Button
        android:id="@+id/btn_clear"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentRight="true"
        android:layout_below="@+id/btn_Div"
        android:backgroundTint="@android:color/holo_blue_dark"
        android:text="clear"
        android:textColor="@android:color/background_light"
        android:textSize="18sp" />

  </RelativeLayout>
</android.support.constraint.ConstraintLayout>
```

Java File:

```
package com.example.a84.calculator;


import android.support.v7.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;


public class MainActivity extends AppCompatActivity {

   Button
btn_1,btn_2,btn_3,btn_4,btn_5,btn_6,btn_7,btn_8,btn_9,btn_0,btn_Add,btn_Sub,btn_Mul,btn_Div,btn_
calc,btn_dec,btn_clear;

   EditText ed1;

   float Value1, Value2;

   boolean mAddition, mSubtract, mMultiplication, mDivision ;


   @Override

   protected void onCreate(Bundle savedInstanceState) {

      super.onCreate(savedInstanceState);

      setContentView(R.layout.activity_main);


      btn_0 = (Button) findViewById(R.id.btn_0);

      btn_1 = (Button) findViewById(R.id.btn_1);

      btn_2 = (Button) findViewById(R.id.btn_2);

      btn_3 = (Button) findViewById(R.id.btn_3);

      btn_4 = (Button) findViewById(R.id.btn_4);

      btn_5 = (Button) findViewById(R.id.btn_5);
```

```
btn_6 = (Button) findViewById(R.id.btn_6);
btn_7 = (Button) findViewById(R.id.btn_7);
btn_8 = (Button) findViewById(R.id.btn_8);
btn_9 = (Button) findViewById(R.id.btn_9);
btn_Add = (Button) findViewById(R.id.btn_Add);
btn_Div = (Button) findViewById(R.id.btn_Div);
btn_Sub = (Button) findViewById(R.id.btn_Sub);
btn_Mul = (Button) findViewById(R.id.btn_Mul);
btn_calc = (Button) findViewById(R.id.btn_calc);
btn_dec = (Button) findViewById(R.id.btn_dec);
btn_clear = (Button) findViewById(R.id.btn_clear);
ed1 = (EditText) findViewById(R.id.edText1);

btn_0.setOnClickListener(new View.OnClickListener() {
   @Override
   public void onClick(View v) {
      ed1.setText(ed1.getText()+"0");
   }
});

btn_1.setOnClickListener(new View.OnClickListener() {
   @Override
   public void onClick(View v) {
      ed1.setText(ed1.getText()+"1");
   }
});
```

```
btn_2.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"2");
    }
});

btn_3.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"3");
    }
});

btn_4.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"4");
    }
});

btn_5.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"5");
    }
});
```

```
btn_6.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"6");
    }
});

btn_7.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"7");
    }
});

btn_8.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"8");
    }
});

btn_9.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+"9");
    }
```

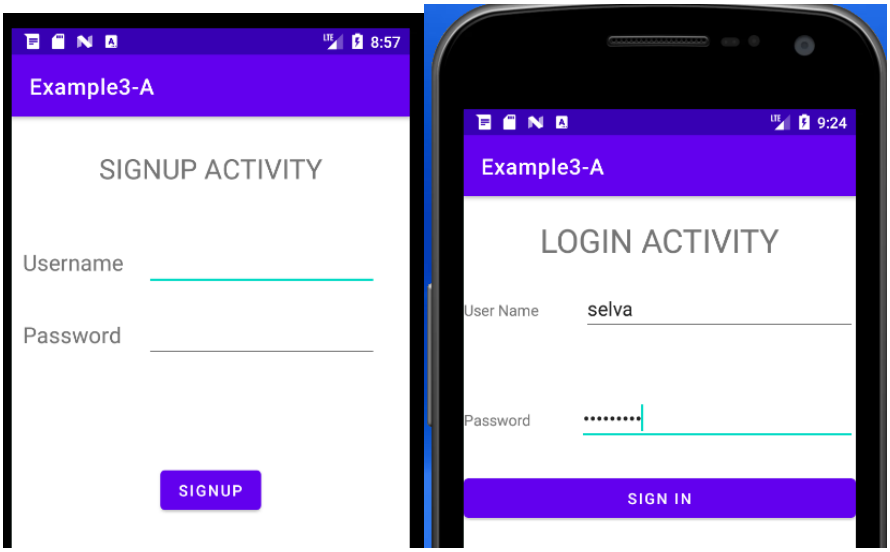
```
});

btn_dec.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText(ed1.getText()+".");
    }
});

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

        if (ed1 == null){
            ed1.setText("");
        }else {
            Value1 = Float.parseFloat(ed1.getText() + "");
            mAddition = true;
            ed1.setText(null);
        }
    }
});

btn_Sub.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Value1 = Float.parseFloat(ed1.getText() + "");
```

```
        mSubtract = true ;
        ed1.setText(null);
    }
});

btn_Mul.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v) {
        Value1 = Float.parseFloat(ed1.getText() + "");
        mMultiplication = true ;
        ed1.setText(null);
    }
});

btn_Div.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v) {
        Value1 = Float.parseFloat(ed1.getText()+"");
        mDivision = true ;
        ed1.setText(null);
    }
});

btn_calc.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v) {
        Value2 = Float.parseFloat(ed1.getText() + "");
```

```
        if (mAddition == true){
            ed1.setText(Value1 + Value2 +"");
            mAddition=false;
        }

        if (mSubtract == true){
            ed1.setText(Value1 - Value2 +"");
            mSubtract=false;
        }

        if (mMultiplication == true){
            ed1.setText(Value1 * Value2 + "");
            mMultiplication=false;
        }

        if (mDivision == true){
            ed1.setText(Value1 / Value2+"");
            mDivision=false;
        }
    }
});

btn_clear.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        ed1.setText("");
```

```
        }
    });
  }

}
```

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 "Sucessful 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.




```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.example3_a">

    <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/Theme.Example3A">
        <activity android:name=".ThirdActivity"></activity>
```

```
        <activity android:name=".SecondActivity" />
        <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>
```

MainActivity:

```
package com.example.example3_a;

import android.content.Intent;
import androidx.appcompat.app.AppCompatActivity;
        import android.os.Bundle;
        import android.view.View;
        import android.widget.ArrayAdapter;
        import android.widget.Button;
        import android.widget.EditText;
        import android.widget.Spinner;
import android.widget.Toast;

import com.google.android.material.textfield.TextInputLayout;

import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {

        //Defining the Views
        EditText e1,e2;
        Button bt;

        String name1, name2;

        // defining our own password pattern
                private static final Pattern PASSWORD_PATTERN =
                        Pattern.compile("^" +
                                "(?=.*[@#$%^&+=])" +     // at least 1 special
character
                                "(?=\\S+$)" +            // no white spaces
                                "(?=.*[A-Z])(?=.*[a-z]).*" + //upper case and lower
case letter
                                ".{8,}" +                // at least 8 characters
                                "$");
 /*                       Pattern.compile("^" +
                                "(?=.*[@#$%^&+=])" +     // at least 1 special
character
                                "(?=\\S+$)" +            // no white spaces
                                ".{8,}" +                // at least 8 characters
                                "$");*/
                private TextInputLayout editText2; //password

                @Override
```

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

        //Referring the Views
        e1= (EditText) findViewById(R.id.editText);
        e2= (EditText) findViewById(R.id.editText2);

        bt= (Button) findViewById(R.id.button);

         //Creating Listener for Button
        bt.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {

        //Getting the Values from Views(Edittext & Spinner)
        name1=e1.getText().toString();
        name2=e2.getText().toString();
        //dept=s.getSelectedItem().toString();
        if(validatePassword()) {
                //Intent For Navigating to Second Activity
                Intent i = new Intent(MainActivity.this, SecondActivity.class);

                //For Passing the Values to Second Activity
                i.putExtra("name_key", name1);
                i.putExtra("reg_key", name2);
                startActivity(i);
        }
        }
        });
                        }


        private boolean validatePassword() {
                        String passwordInput = name2.trim();
                        // if password field is empty
                        // it will display error message "Field can not be empty"

Toast.makeText(getApplicationContext(),passwordInput,Toast.LENGTH_SHORT).show();
                        if (passwordInput.isEmpty()) {
                                e2.setError("Field can not be empty");
                                return false;
                        }

                        // if password does not matches to the pattern
                        // it will display an error message "Password is too weak"
                        else if (!PASSWORD_PATTERN.matcher(passwordInput).matches())
{
                                e2.setError("Password is too weak");
                                return false;
                        } else {
                                e2.setError(null);
                                return true;
                        }
                }
        }
```

SeconActivity.java:

```
package com.example.example3_a;

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

public class SecondActivity extends AppCompatActivity {

        EditText un,pwd;
        Button b1;
        String name,pass;

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

        un= (EditText) findViewById(R.id.edtUsername);
        pwd= (EditText) findViewById(R.id.edtPassword);
        b1 = (Button) findViewById(R.id.btn_signin);
         //Getting the Intent
        Intent i = getIntent();
        //Getting the Values from First Activity using the Intent received
        name=i.getStringExtra("name_key");
        pass=i.getStringExtra("reg_key");
        Toast.makeText(getApplicationContext(),name + " "
+pass,Toast.LENGTH_LONG).show();
        }


                public void validate(View view) {
                      String usn = un.getText().toString();
                        String pswd = pwd.getText().toString();
                      if( usn.equals(name) && pswd.equals(pass)) {
                              Intent i = new Intent(SecondActivity.this,
ThirdActivity.class);
                              startActivity(i);
                      }
                      else
                      {
                              Toast.makeText(getApplicationContext(),"Login
Failed",Toast.LENGTH_SHORT).show();
                      }
                }
        }
```

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

Wallpaper

Manifest.xml:

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

    <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/Theme.WallPaperChanger">
        <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>
```

XML:

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Wall Paper Changer"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.064" />

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

```
        android:layout_marginTop="104dp"
        android:text="Change WallPaper"
        android:onClick="ChangeImage"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.042" />

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

Activity.java:

```
package com.example.wallpaperchanger;

import androidx.appcompat.app.AppCompatActivity;

import android.app.WallpaperManager;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.Toast;

import java.io.IOError;
import java.io.IOException;
import java.util.Random;

public class MainActivity extends AppCompatActivity {
    int[] images;
    Handler handler;
    Runnable runnable;
    int delay = 30000;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        handler = new Handler();
    }
    @Override
    protected void onResume() {
        handler.postDelayed(runnable = new Runnable() {
            public void run() {
                handler.postDelayed(runnable, delay);
                SetWallPaper();
                //Toast.makeText(MainActivity.this, "This method is run every 30
seconds",
                        // Toast.LENGTH_SHORT).show();
            }
        }, delay);
        super.onResume();
    }
    @Override
    protected void onPause() {
```

```
        super.onPause();
        handler.removeCallbacks(runnable); //stop handler when activity not visible
super.onPause();
    }

    public void ChangeImage(View view) {

       SetWallPaper();
    }
    private void SetWallPaper()
    {
        images = new int[] {R.drawable.a,R.drawable.b,R.drawable.c,R.drawable.d};
        int arylength = images.length;
        Random random = new Random();
        int rnum = random.nextInt(arylength);
        Bitmap bitmap = BitmapFactory.decodeResource(getResources(),images[rnum]);
        WallpaperManager manager =
WallpaperManager.getInstance(getApplicationContext());
        try {
            manager.setBitmap(bitmap);
            Toast.makeText(this,"Wall Paper changed",Toast.LENGTH_SHORT).show();

        }
        catch(IOException e)
        {
            Toast.makeText(this,"Error",Toast.LENGTH_SHORT).show();
        }
    }
}
```

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 Tex t View control

Counter App

Activity_main.xml:

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

```
android:layout_width="match_parent"
android:layout_height="fill_parent"
>
<TextView
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="@string/hello"
    />
<Chronometer
    android:id="@+id/chronometer"
    android:layout_gravity="center_horizontal"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    />
<Button
    android:id="@+id/buttonstart"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Start"
    />
<Button
    android:id="@+id/buttonstop"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Stop"
    />
<Button   android:id="@+id/buttonreset"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Reset"
    />
</LinearLayout>
```

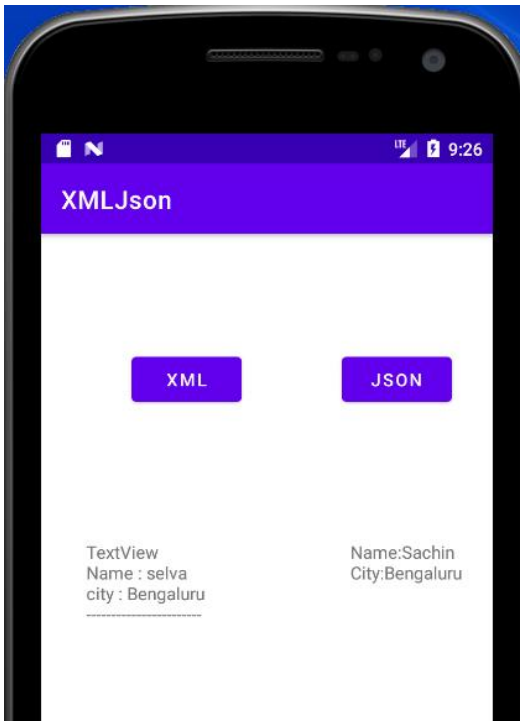
MainActivity.java:

```
package com.example.program5_a;
import android.app.Activity;
import android.os.Bundle;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.Chronometer;

public class MainActivity extends Activity {
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        final Chronometer myChronometer =
(Chronometer)findViewById(R.id.chronometer);
        Button buttonStart = (Button)findViewById(R.id.buttonstart);
        Button buttonStop = (Button)findViewById(R.id.buttonstop);
        Button buttonReset = (Button)findViewById(R.id.buttonreset);

        buttonStart.setOnClickListener(new Button.OnClickListener(){
```

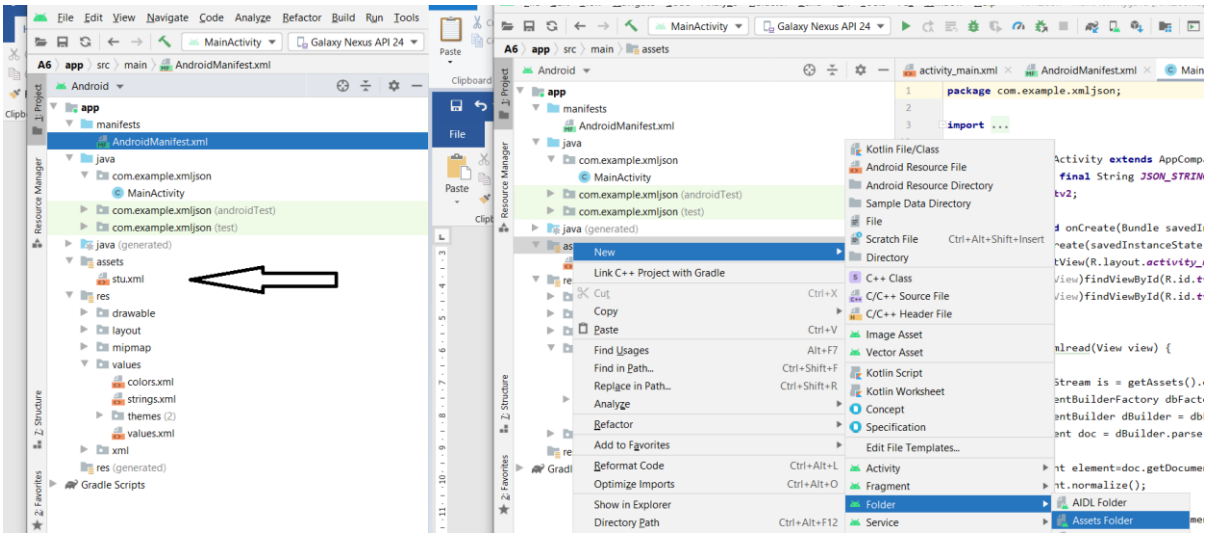
```
            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.start();
            }});

        buttonStop.setOnClickListener(new Button.OnClickListener(){

            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.stop();

            }});

        buttonReset.setOnClickListener(new Button.OnClickListener(){

            @Override
            public void onClick(View v) {
                // TODO Auto-generated method stub
                myChronometer.setBase(SystemClock.elapsedRealtime());

            }});


    }
}
```

6. Create two files of XML and JSON type with values for City_name, Latitude, Longitude, Temperature, and Humidity. Develop an application to create an activity with two buttons to parse the XML and JSON files which when clicked should display the data in their respective layouts side by side.

https://bezkoder.com/java-android-read-json-file-assets-gson/



Create Assest folder and copy paste the xml and json file



AndroidManifest.xml

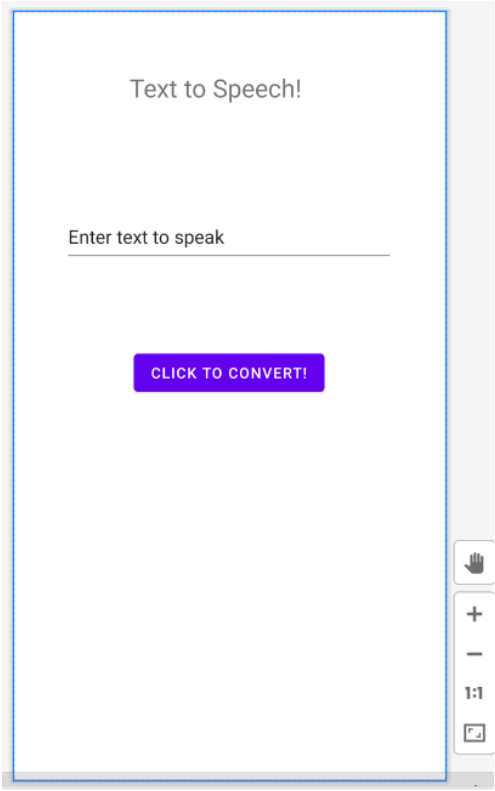
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.xmljson">

    <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/Theme.XMLJson">
        <meta-data
            android:name="com.google.android.actions"
            android:resource="@xml/actions" />

        <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>
```

MainActivity.java

```
package com.example.xmljson;

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

import androidx.appcompat.app.AppCompatActivity;

import org.json.JSONObject;
import org.w3c.dom.Document;
import org.w3c.dom.Element;
import org.w3c.dom.Node;
import org.w3c.dom.NodeList;

import java.io.InputStream;

import javax.xml.parsers.DocumentBuilder;
import javax.xml.parsers.DocumentBuilderFactory;

public class MainActivity extends AppCompatActivity {
    public static final String
JSON_STRING="{\"student\":{\"name\":\"Sachin\",\"city\":\"Bengaluru\"}}";
    TextView tv1,tv2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        tv1=(TextView)findViewById(R.id.tv_xml);
        tv2=(TextView)findViewById(R.id.tv_json);
            }
```

```
    public void xmlread(View view) {
        try {
            InputStream is = getAssets().open("stu.xml");
            DocumentBuilderFactory dbFactory = DocumentBuilderFactory.newInstance();
            DocumentBuilder dBuilder = dbFactory.newDocumentBuilder();
            Document doc = dBuilder.parse(is);

            Element element=doc.getDocumentElement();
            element.normalize();

            NodeList nList = doc.getElementsByTagName("student");

            for (int i=0; i<nList.getLength(); i++) {

                Node node = nList.item(i);
                if (node.getNodeType() == Node.ELEMENT_NODE) {
                    Element element2 = (Element) node;
                    tv1.setText(tv1.getText()+"\nName : " + getValue("name",
element2)+"\n");
                    tv1.setText(tv1.getText()+"city : " + getValue("city",
element2)+"\n");
                    tv1.setText(tv1.getText()+"-----------------------");
                }
            }

        } catch (Exception e) {e.printStackTrace();}
    }
    private static String getValue(String tag, Element element) {
        NodeList nodeList =
element.getElementsByTagName(tag).item(0).getChildNodes();
        Node node = nodeList.item(0);
        return node.getNodeValue();
    }

    public void readJson(View view) {
        try{

            JSONObject emp=(new JSONObject(JSON_STRING)).getJSONObject("student");
            String empname=emp.getString("name");
            String city=emp.getString("city");

            String str="Name:"+empname+"\n"+"City:"+city;
            tv2.setText(str);

        }catch (Exception e) {e.printStackTrace();}
    }

}
```

7. Develop a simple application with one Edit Text 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.



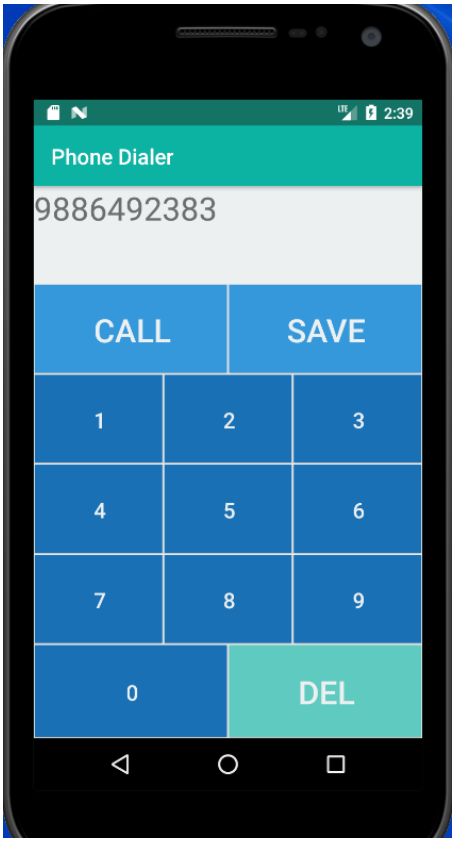
AndroidManifest.xml

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

    <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/Theme.TexttoSpeech">
        <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>
```

MainActivity.java

```
package com.example.texttospeech;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    TextToSpeech t1;
    EditText ed1;
    Button b1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ed1=(EditText)findViewById(R.id.editTextTextPersonName);
        b1=(Button)findViewById(R.id.button);

        t1=new TextToSpeech(getApplicationContext(), new
TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int status) {
                if(status != TextToSpeech.ERROR) {
                    t1.setLanguage(Locale.UK);
                }
            }
        });
    }

    public void Text2Speech(View view) {
            String toSpeak = ed1.getText().toString();
            Toast.makeText(getApplicationContext(),
toSpeak,Toast.LENGTH_SHORT).show();
            t1.speak(toSpeak, TextToSpeech.QUEUE_FLUSH, null);

    }+
}
```

8. 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.



AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.DataFlair.mycalculator">
    <uses-permission android:name="android.permission.CALL_PHONE" />
    <uses-permission android:name="android.intent.action.CALL_PRIVILEGED"/>
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />

    <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>
```

MainActivity.java

```
package com.DataFlair.mycalculator;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
import android.os.Build;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;


public class MainActivity extends AppCompatActivity {

    double in1 = 0, i2 = 0;
    TextView edittext1;
    boolean Add, Sub, Multiply, Divide, Remainder, deci;
    Button button_0, button_1, button_2, button_3, button_4, button_5, button_6,
button_7, button_8, button_9, button_Add, button_Sub,
            button_Mul, button_Div, button_Equ, button_del, button_call, button_save;

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

        button_0 = (Button) findViewById(R.id.b0);
        button_1 = (Button) findViewById(R.id.b1);
        button_2 = (Button) findViewById(R.id.b2);
        button_3 = (Button) findViewById(R.id.b3);
        button_4 = (Button) findViewById(R.id.b4);
        button_5 = (Button) findViewById(R.id.b5);
        button_6 = (Button) findViewById(R.id.b6);
        button_7 = (Button) findViewById(R.id.b7);
        button_8 = (Button) findViewById(R.id.b8);
        button_9 = (Button) findViewById(R.id.b9);
        button_del = (Button) findViewById(R.id.BRemain);
        button_call = (Button) findViewById(R.id.buttonDel);
        button_save = (Button) findViewById(R.id.buttoneql);

        edittext1 = (TextView) findViewById(R.id.display);

        button_1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                edittext1.setText(edittext1.getText() + "1");
            }
        });

        button_2.setOnClickListener(new View.OnClickListener() {
```

```
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "2");
    }
});

button_3.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "3");
    }
});

button_4.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "4");
    }
});

button_5.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "5");
    }
});

button_6.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "6");
    }
});

button_7.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "7");
    }
});

button_8.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "8");
    }
});

button_9.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "9");
    }
});

button_0.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        edittext1.setText(edittext1.getText() + "0");
```

```
            }
        });


        button_del.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (edittext1.getText().length() != 0) {
                    edittext1.setText("");
                    in1 = 0.0;
                    i2 = 0.0;
                }
            }
        });

        button_save.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
               Intent intent = new Intent(ContactsContract.Intents.Insert.ACTION);
               intent.setType(ContactsContract.RawContacts.CONTENT_TYPE);
               intent.putExtra(ContactsContract.Intents.Insert.PHONE,
edittext1.getText());
                startActivity(intent);
            }
        });

        button_call.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                final int REQUEST_PHONE_CALL = 1;
                if (android.os.Build.VERSION.SDK_INT >= Build.VERSION_CODES.M) {
                    if (ContextCompat.checkSelfPermission(MainActivity.this,
Manifest.permission.CALL_PHONE) != PackageManager.PERMISSION_GRANTED) {
                        ActivityCompat.requestPermissions(MainActivity.this, new
String[]{Manifest.permission.CALL_PHONE}, REQUEST_PHONE_CALL);
                    }
                    else {
                        String number = edittext1.getText().toString();
                        Intent callIntent = new Intent(Intent.ACTION_CALL);
                        callIntent.setData(Uri.parse("tel:" + number));
                        startActivity(callIntent);
                    }
                }
             }
        });

    }
}
```

PART B

1. 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.

Program-1:DATABASE

MainActivity.java:

```
package com.example.example5;
import android.app.Activity;
import android.app.AlertDialog.Builder;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends Activity implements OnClickListener
{
    EditText Rollno,Name,Marks;
    Button Insert,Delete,Update,View,ViewAll;
    SQLiteDatabase db;
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        Rollno=(EditText)findViewById(R.id.Medicine);
        Name=(EditText)findViewById(R.id.meddate);
        Marks=(EditText)findViewById(R.id.medtime);
        Insert=(Button)findViewById(R.id.Insert);
        Delete=(Button)findViewById(R.id.Delete);
        Update=(Button)findViewById(R.id.Update);
        View=(Button)findViewById(R.id.View);
        ViewAll=(Button)findViewById(R.id.ViewAll);

        Insert.setOnClickListener(this);
        Delete.setOnClickListener(this);
        Update.setOnClickListener(this);
        View.setOnClickListener(this);
        ViewAll.setOnClickListener(this);

        // Creating database and table
```

```
        db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE,
null);
        db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno
VARCHAR,name VARCHAR,marks VARCHAR);");
    }



    public void onClick(View view)
    {
        // Inserting a record to the Student table
        if(view==Insert)
        {
            // Checking for empty fields
            if(Rollno.getText().toString().trim().length()==0||
                    Name.getText().toString().trim().length()==0||
                    Marks.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter all values");
                return;
            }
            db.execSQL("INSERT INTO student
VALUES('"+Rollno.getText()+"','"+Name.getText()+
                    "','"+Marks.getText()+"');");
            showMessage("Success", "Record added");
            clearText();
        }
        // Deleting a record from the Student table
        if(view==Delete)
        {
            // Checking for empty roll number
            if(Rollno.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
            if(c.moveToFirst())
            {
                db.execSQL("DELETE FROM student WHERE
rollno='"+Rollno.getText()+"'");
                showMessage("Success", "Record Deleted");
            }
            else
            {
                showMessage("Error", "Invalid Rollno");
            }
            clearText();
```

```
        }
        // Updating a record in the Student table
        if(view==Update)
        {
            // Checking for empty roll number
            if(Rollno.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
            if(c.moveToFirst()) {
                db.execSQL("UPDATE student SET name='"+ Name.getText()
+ "',marks='"+ Marks.getText() +
                        "' WHERE rollno='"+Rollno.getText()+"'");
                showMessage("Success", "Record Modified");
            }
            else{
                showMessage("Error", "Invalid Rollno");
            }
            clearText();
        }
        // Display a record from the Student table
        if(view==View)
        {
            // Checking for empty roll number
            if(Rollno.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
            if(c.moveToFirst())
            {
                Name.setText(c.getString(1));
                Marks.setText(c.getString(2));
            }
            else
            {
                showMessage("Error", "Invalid Rollno");
                clearText();
            }
        }
        // Displaying all the records
        if(view==ViewAll)
        {
            Cursor c=db.rawQuery("SELECT * FROM student", null);
```

```
            if(c.getCount()==0)
            {
                showMessage("Error", "No records found");
                return;
            }
            StringBuffer buffer=new StringBuffer();
            while(c.moveToNext())
            {
                buffer.append("Rollno: "+c.getString(0)+"\n");
                buffer.append("Name: "+c.getString(1)+"\n");
                buffer.append("Marks: "+c.getString(2)+"\n\n");
            }
            showMessage("Student Details", buffer.toString());
        }
    }
    public void showMessage(String title,String message)
    {
        Builder builder=new Builder(this);
        builder.setCancelable(true);
        builder.setTitle(title);
        builder.setMessage(message);
        builder.show();
    }
    public void clearText()
    {
        Rollno.setText("");
        Name.setText("");
        Marks.setText("");
        Rollno.requestFocus();
    }
}
```

Program-2:

Program-3:

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.

Manifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.smsnotification">
    <uses-permission android:name="android.permission.WRITE_SMS" />
    <uses-permission android:name="android.permission.READ_SMS" />
    <uses-permission android:name="android.permission.RECEIVE_SMS" />

    <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/Theme.SMSNotification">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <receiver android:name=".SMSIncoming" android:exported="true" >
            <intent-filter android:priority="999" >
                <action
android:name="android.provider.Telephony.SMS_RECEIVED" />
            </intent-filter>
        </receiver>
      </application>

</manifest>
```

MainActivity.java:

```
package com.example.smsnotification;

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

```
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.content.ContentResolver;
import android.content.pm.PackageManager;
import android.database.Cursor;
import android.net.Uri;
import android.os.Bundle;
import android.provider.Telephony;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    private static MainActivity inst;
    ArrayList<String> smsMessagesList = new ArrayList<String>();
    ListView smsListView;
    ArrayAdapter arrayAdapter;
    public static MainActivity instance() {
        return inst;
    }
    @Override
    public void onStart() {
        super.onStart();
        inst = this;
    }
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        smsListView = (ListView) findViewById(R.id.SMSList);
        arrayAdapter = new ArrayAdapter<String>(this,
android.R.layout.simple_list_item_1, smsMessagesList);
        smsListView.setAdapter(arrayAdapter);
        smsListView.setOnItemClickListener(this::onItemClick);
        if(ContextCompat.checkSelfPermission(getBaseContext(),
"android.permission.READ_SMS") == PackageManager.PERMISSION_GRANTED) {
            refreshSmsInbox();
        }
        else
        {
            final int REQUEST_CODE_ASK_PERMISSIONS = 123;
            ActivityCompat.requestPermissions(MainActivity.this, new
String[]{"android.permission.READ_SMS"}, REQUEST_CODE_ASK_PERMISSIONS);
```

```
        }

    }

    public void refreshSmsInbox() {
        ContentResolver contentResolver = getContentResolver();
        Cursor smsInboxCursor =
contentResolver.query(Uri.parse("content://sms/inbox"), null, null,
null, null);
        int indexBody = smsInboxCursor.getColumnIndex("body");
        int indexAddress = smsInboxCursor.getColumnIndex("address");
        if (indexBody < 0 || !smsInboxCursor.moveToFirst()) return;
        arrayAdapter.clear();
        do {
            String str = "SMS From: " +
smsInboxCursor.getString(indexAddress) +
                    "\n" + smsInboxCursor.getString(indexBody) + "\n";
            arrayAdapter.add(str);
        } while (smsInboxCursor.moveToNext());
    }

    public void updateList(final String smsMessage) {
        arrayAdapter.insert(smsMessage, 0);
        arrayAdapter.notifyDataSetChanged();
    }

    public void onItemClick(AdapterView<?> parent, View view, int pos,
long id) {
        try {
            String[] smsMessages =
smsMessagesList.get(pos).split("\n");
            String address = smsMessages[0];
            String smsMessage = "";
            for (int i = 1; i < smsMessages.length; ++i) {
                smsMessage += smsMessages[i];
            }

            String smsMessageStr = address + "\n";
            smsMessageStr += smsMessage;
            Toast.makeText(this, smsMessageStr,
Toast.LENGTH_SHORT).show();
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

SMS Incoming.java:

```
package com.example.smsnotification;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.telephony.SmsMessage;
import android.util.Log;
import android.widget.Toast;

import com.example.smsnotification.MainActivity;

public class SMSIncoming extends BroadcastReceiver {

    public static final String SMS_BUNDLE = "pdus"; //protocol data
unit (PDU)

    public void onReceive(Context context, Intent intent) {
        Bundle intentExtras = intent.getExtras();
        if (intentExtras != null) {
            Object[] sms = (Object[]) intentExtras.get(SMS_BUNDLE);
            String smsMessageStr = "";
            for (int i = 0; i < sms.length; ++i) {
                SmsMessage smsMessage =
SmsMessage.createFromPdu((byte[]) sms[i]);

                String smsBody =
smsMessage.getMessageBody().toString();
                String address = smsMessage.getOriginatingAddress();

                smsMessageStr += "SMS From: " + address + "\n";
                smsMessageStr += smsBody + "\n";
            }

//Toast.makeText(context,"Hellooooooo",Toast.LENGTH_LONG).show();
            Toast.makeText(context, smsMessageStr,
Toast.LENGTH_SHORT).show();

            //this will update the UI with message
            MainActivity inst = MainActivity.instance();
            inst.updateList(smsMessageStr);
        }
    }

}
```

Program-4:

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 MkSDcard. 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".

sdcard

Java file:

```
package com.example.sdcard;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStreamReader;
import java.io.OutputStreamWriter;


public class MainActivity extends AppCompatActivity {

    EditText txtdata;
    Button btn_save, btn_open, btn_create;
    // Storage Permissions
    private static final int REQUEST_EXTERNAL_STORAGE = 1;
    private static String[] PERMISSIONS_STORAGE = {
            Manifest.permission.READ_EXTERNAL_STORAGE,
            Manifest.permission.WRITE_EXTERNAL_STORAGE
```

```
    };

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        txtdata = findViewById(R.id.editTextcontent);
        btn_save = findViewById(R.id.btn_save);
        btn_open = findViewById(R.id.btn_open);
        btn_create = findViewById(R.id.btn_create);

    }


    public void call_create(View view) {
            String filename = "myfile1.txt";
            String data = txtdata.getText().toString();

            FileOutputStream fos;
        int permission =
ActivityCompat.checkSelfPermission(MainActivity.this,
Manifest.permission.WRITE_EXTERNAL_STORAGE);

        if (permission != PackageManager.PERMISSION_GRANTED) {
            // We don't have permission so prompt the user
            ActivityCompat.requestPermissions(
                    MainActivity.this,
                    PERMISSIONS_STORAGE,
                    REQUEST_EXTERNAL_STORAGE
            );
        }
        else{
                  try {
                        File myFile = new File("/sdcard/" + filename);
                        myFile.createNewFile();
                        Toast.makeText(getApplicationContext(),
filename + " Created", Toast.LENGTH_LONG).show();

            } catch (IOException e) {
                e.printStackTrace();
            }
        }
        }

    public void call_save(View view) {
        String filename = "myfile1.txt";
        String data = txtdata.getText().toString();

        File file = new File("/sdcard/"+filename);
```

```
        if(file.exists())
        {
                    FileOutputStream fos;
        try {
            FileOutputStream fOut = new
FileOutputStream("/sdcard/"+filename);
            OutputStreamWriter myOutWriter = new
OutputStreamWriter(fOut);
            myOutWriter.append(data);
            myOutWriter.close();
            fOut.close();
            Toast.makeText(getApplicationContext(), filename + "
Saved", Toast.LENGTH_LONG).show();
            txtdata.setText("");

        } catch (IOException e) {
            Toast.makeText(getApplicationContext(), "First create a
File", Toast.LENGTH_LONG).show();
            e.printStackTrace();
        }
        }

        else
            Toast.makeText(getApplicationContext(), "First create a
File", Toast.LENGTH_LONG).show();
    }


    public void call_open(View view) {
        String filename = "myfile1.txt";
        String aDataRow = "";
        String aBuffer = "";
        try {
            File myFile = new File("/sdcard/"+filename);
            FileInputStream fIn = new FileInputStream(myFile);
            BufferedReader myReader = new BufferedReader(
                    new InputStreamReader(fIn));
            while ((aDataRow = myReader.readLine()) != null) {
                aBuffer += aDataRow + "\n";
            }
            myReader.close();
        } catch (IOException e) {
            e.printStackTrace();
        }

Toast.makeText(getApplicationContext(),aBuffer,Toast.LENGTH_LONG).show(
);
        txtdata.setText(aBuffer);
    }
```

```
}
```

Manifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.sdcard">
    <uses-permission
android:name="android.permission.WRITE_EXTERNAL_STORAGE"/>
    <uses-permission
android:name="android.permission.READ_EXTERNAL_STORAGE"/>
    <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/Theme.SdCard">
        <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>
```

Program-5:

Create an application to demonstrate a basic media playerthat 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.

Media Player

Java file:

```
package com.example.mediaplayer;

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

```
import android.media.MediaPlayer;
import android.os.Bundle;
import android.os.Handler;
import android.view.View;
import android.widget.ImageButton;
import android.widget.SeekBar;
import android.widget.TextView;
import android.widget.Toast;

import java.util.concurrent.TimeUnit;

public class MainActivity extends AppCompatActivity {
    private ImageButton forwardbtn, backwardbtn, pausebtn, playbtn;
    private MediaPlayer mPlayer;
    private TextView songName, startTime, songTime;
    private SeekBar songPrgs;
    private static int oTime =0, sTime =0, eTime =0, fTime = 5000,
bTime = 5000;
    private Handler hdlr = new Handler();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        backwardbtn = (ImageButton)findViewById(R.id.btnBackward);
        forwardbtn = (ImageButton)findViewById(R.id.btnForward);
        playbtn = (ImageButton)findViewById(R.id.btnPlay);
        pausebtn = (ImageButton)findViewById(R.id.btnPause);
        songName = (TextView)findViewById(R.id.txtSname);
        startTime = (TextView)findViewById(R.id.txtStartTime);
        songTime = (TextView)findViewById(R.id.txtSongTime);
        songName.setText("Sample MP3");
        mPlayer = MediaPlayer.create(this, R.raw.sample);
        songPrgs = (SeekBar)findViewById(R.id.sBar);
        songPrgs.setClickable(true);
        pausebtn.setEnabled(true);

        playbtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Toast.makeText(MainActivity.this, "Playing Audio",
Toast.LENGTH_SHORT).show();
                mPlayer.start();
                eTime = mPlayer.getDuration();
                sTime = mPlayer.getCurrentPosition();
                if(oTime == 0){
                    songPrgs.setMax(eTime);
                    oTime =1;
                }
                songTime.setText(String.format("%d min, %d sec",
```

```
TimeUnit.MILLISECONDS.toMinutes(eTime),
                        TimeUnit.MILLISECONDS.toSeconds(eTime) -
TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS. toMinutes(eTime))) );
                startTime.setText(String.format("%d min, %d sec",
TimeUnit.MILLISECONDS.toMinutes(sTime),
                        TimeUnit.MILLISECONDS.toSeconds(sTime) -
TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS. toMinutes(sTime))) );
                songPrgs.setProgress(sTime);
                hdlr.postDelayed(UpdateSongTime, 100);
                pausebtn.setEnabled(true);
                playbtn.setEnabled(false);
            }
        });
        pausebtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                mPlayer.pause();
                pausebtn.setEnabled(false);
                playbtn.setEnabled(true);
                Toast.makeText(getApplicationContext(),"Pausing Audio",
Toast.LENGTH_SHORT).show();
            }
        });
        forwardbtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if((sTime + fTime) <= eTime)
                {
                    sTime = sTime + fTime;
                    mPlayer.seekTo(sTime);
                }
                else
                {
                    Toast.makeText(getApplicationContext(), "Cannot
jump forward 5 seconds", Toast.LENGTH_SHORT).show();
                }
                if(!playbtn.isEnabled()){
                    playbtn.setEnabled(true);
                }
            }
        });
        backwardbtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if((sTime - bTime) > 0)
                {
                    sTime = sTime - bTime;
                    mPlayer.seekTo(sTime);
                }
```

```
                else
                {
                    Toast.makeText(getApplicationContext(), "Cannot
jump backward 5 seconds", Toast.LENGTH_SHORT).show();
                }
                if(!playbtn.isEnabled()){
                    playbtn.setEnabled(true);
                }
            }
        });
    }
    private Runnable UpdateSongTime = new Runnable() {
        @Override
        public void run() {
            sTime = mPlayer.getCurrentPosition();
            startTime.setText(String.format("%d min, %d sec",
TimeUnit.MILLISECONDS.toMinutes(sTime),
                    TimeUnit.MILLISECONDS.toSeconds(sTime) -
TimeUnit.MINUTES.toSeconds(TimeUnit.MILLISECONDS.toMinutes(sTime))) );
            songPrgs.setProgress(sTime);
            hdlr.postDelayed(this, 100);
        }
    };
}
```

Program-6:

Develop an application to demonstrate the use of Asynchronous tasks in android. The asynchronous task should implement the functionality of a simple moving banner. On pressing the Start Task button, the banner message should scrollfrom right to left. On pressing the Stop Task button, the banner message should stop.Let the banner message be “Demonstration of Asynchronous Task”.

ActivityMain.xml

```
<?xml version = "1.0" encoding = "utf-8"?>

<LinearLayout xmlns:android = "http://schemas.android.com/apk/res/android"

xmlns:tools = "http://schemas.android.com/tools"

android:id = "@+id/rootview"

android:layout_width = "match_parent"

android:layout_height = "match_parent"

android:orientation = "vertical"

android:background = "#c1c1c1"

android:gravity = "center_horizontal"

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

```
<Button
   android:id = "@+id/asyncTask"
   android:text = "Download"
   android:layout_width = "wrap_content"
   android:layout_height = "wrap_content"/>
<ImageView
   android:id = "@+id/image"
   android:layout_width = "300dp"
   android:layout_height = "300dp" />
<ImageView
   android:id = "@+id/image2"
   android:layout_width = "300dp"
   android:layout_height = "300dp" />
</LinearLayout>
```

MainActivity.java

```
package com.example.example6_b;

import android.app.ProgressDialog;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.AsyncTask;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import java.io.IOException;
import java.io.InputStream;
```

```
import java.net.HttpURLConnection;
import java.net.URL;


public class MainActivity extends AppCompatActivity {
   URL ImageUrl = null;
   InputStream is = null;
   Bitmap bmImg = null;
   ImageView imageView = null;
   ImageView imageView2 = null;
   AsyncTaskExample asyncTask = null;
   AsyncTaskExample2 asyncTask2 = null;
   ProgressDialog p;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
       super.onCreate(savedInstanceState);
       setContentView(R.layout.activity_main);
       Button button = findViewById(R.id.asyncTask);
       imageView = findViewById(R.id.image);
       imageView2 = findViewById(R.id.image2);
       button.setOnClickListener(new View.OnClickListener() {
           @Override
           public void onClick(View v) {
               asyncTask2 = new AsyncTaskExample2();
               asyncTask2.executeOnExecutor(AsyncTask.THREAD_POOL_EXECUTOR,
"https://www.tutorialspoint.com/cprogramming/images/logo.png");
               asyncTask = new AsyncTaskExample();
               asyncTask.executeOnExecutor(AsyncTask.THREAD_POOL_EXECUTOR,
"https://www.tutorialspoint.com/images/tp-logo-diamond.png");
           }
       });
   }
```

```
private class AsyncTaskExample extends AsyncTask<String, String, Bitmap> {
    @Override
    protected void onPreExecute() {
        super.onPreExecute();
        p = new ProgressDialog(MainActivity.this);
        p.setMessage("Please wait...It is downloading");
        p.setIndeterminate(true);
        p.setCancelable(false);
        p.show();
    }
    @Override
    protected Bitmap doInBackground(String... strings) {
        try {
            ImageUrl = new URL(strings[0]);
            HttpURLConnection conn = (HttpURLConnection) ImageUrl
                    .openConnection();
            conn.setDoInput(true);
            conn.connect();
            is = conn.getInputStream();
            BitmapFactory.Options options = new BitmapFactory.Options();
            options.inPreferredConfig = Bitmap.Config.RGB_565;
            bmImg = BitmapFactory.decodeStream(is, null, options);
        } catch (IOException e) {
            e.printStackTrace();
        }
        return bmImg;
    }
    @Override
    protected void onPostExecute(Bitmap bitmap) {
        super.onPostExecute(bitmap);
```

```
            if (imageView!= null) {
                p.hide();
                imageView.setImageBitmap(bitmap);
            } else {
                p.show();
            }
        }
    }
    private class AsyncTaskExample2 extends AsyncTask<String, String, Bitmap> {
        @Override
        protected Bitmap doInBackground(String... strings) {
            try {
                ImageUrl = new URL(strings[0]);
                HttpURLConnection conn = (HttpURLConnection) ImageUrl
                        .openConnection();
                conn.setDoInput(true);
                conn.connect();
                is = conn.getInputStream();
                BitmapFactory.Options options = new BitmapFactory.Options();
                options.inPreferredConfig = Bitmap.Config.RGB_565;
                bmImg = BitmapFactory.decodeStream(is, null, options);
            } catch (IOException e) {
                e.printStackTrace();
            }
            return bmImg;
        }
        @Override
        protected void onPostExecute(Bitmap bitmap) {
            super.onPostExecute(bitmap);
            if (imageView2 != null) {
```

```
                imageView2.setImageBitmap(bitmap);
            } else {
            }
        }
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.example6_b">
    <uses-permission android:name = "android.permission.INTERNET"/>


    <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/Theme.Example6B">
        <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>
```

Program-7:

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.

```
package com.example.clipboard;

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 MainActivity extends AppCompatActivity {

    EditText ed1, ed2;
    Button b1, b2;

    private ClipboardManager myClipboard;
    private ClipData myClip;

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

        ed1 = (EditText) findViewById(R.id.editText);
        ed2 = (EditText) findViewById(R.id.editText2);

        b1 = (Button) findViewById(R.id.button);
        b2 = (Button) findViewById(R.id.button2);

        myClipboard = (ClipboardManager)
getSystemService(CLIPBOARD_SERVICE);

        b1.setOnClickListener(new View.OnClickListener() {

            @Override
            public void onClick(View v) {
                String text;
                text = ed1.getText().toString();

                myClip = ClipData.newPlainText("text", text);
                myClipboard.setPrimaryClip(myClip);
```

```
                Toast.makeText(getApplicationContext(), "Text Copied",
                        Toast.LENGTH_SHORT).show();
            }
        });

        b2.setOnClickListener(new View.OnClickListener() {

            @Override
            public void onClick(View v) {
                ClipData abc = myClipboard.getPrimaryClip();
                ClipData.Item item = abc.getItemAt(0);

                String text = item.getText().toString();
                ed2.setText(text);


                Toast.makeText(getApplicationContext(), "Text Pasted",
                        Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

Program-8:

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 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 and Interest Rate values.

Manifest.xml:

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

    <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/Theme.AIDLProgram">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category
android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <service
            android:name=".AdditionService">
            <intent-filter>
                <action android:name="aidlprogram" />
            </intent-filter>
        </service>

</application>

</manifest>
```

Create new AIDL file:

```
// IMyAidlInterface.aidl
package com.example.aidlprogram;

// Declare any non-default types here with import statements

interface IMyAidlInterface {
    /**
     * Demonstrates some basic types that you can use as parameters
     * and return values in AIDL.
     */
double add(int p, int r, int n);
}
```

Rebuild the project to create Interface file automatically.

Create a service (new java file):

AdditionService.java:

```
package com.example.aidlprogram;

import android.app.Service;
import android.content.Intent;
```

```
import android.os.IBinder;
import android.os.RemoteException;
import android.util.Log;

import static java.lang.Math.pow;

public class AdditionService extends Service {
    private static final String TAG = "AdditionService";

    @Override
    public void onCreate() {
        super.onCreate();
        Log.d(TAG, "onCreate()");
    }

    @Override
    public IBinder onBind(Intent intent) {

        return new IMyAidlInterface.Stub() {
            /**
             * Implementation of the add() method
             */
            public double add(int p, int r, int n) throws
RemoteException {
                Log.d(TAG, String.format("AdditionService.add(%d,
%d)",p, r));
                return p*((r * pow((1+r),n)) /((pow((1+r),n) -1)));
            }

        };
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        Log.d(TAG, "onDestroy()");
    }
}
```

Main Activity.java:

```
package com.example.aidlprogram;

import androidx.appcompat.app.AppCompatActivity;

import android.content.ComponentName;
import android.content.Context;
import android.content.Intent;
```

```
import android.content.ServiceConnection;
import android.os.Bundle;
import android.os.IBinder;
import android.os.RemoteException;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    private static final String TAG = "AIDLDemo";
    IMyAidlInterface service;
    AdditionServiceConnection connection;

    /**
     * This class represents the actual service connection. It casts
the bound
     * stub implementation of the service to the AIDL interface.
     */
    class AdditionServiceConnection implements ServiceConnection {

        public void onServiceConnected(ComponentName name, IBinder
boundService) {
            service = IMyAidlInterface.Stub.asInterface((IBinder)
boundService);
            Log.d(TAG, "onServiceConnected() connected");
            Toast.makeText(getApplicationContext(), "Service
connected", Toast.LENGTH_LONG)
                    .show();
        }

        public void onServiceDisconnected(ComponentName name) {
            service = null;
            Log.d(TAG, "onServiceDisconnected() disconnected");
            Toast.makeText(getApplicationContext(), "Service
connected", Toast.LENGTH_LONG)
                    .show();
        }
    }

    /** Binds this activity to the service. */
    private void initService() {
        connection = new AdditionServiceConnection();
        Intent i = new Intent();
        i.setClassName("com.example.aidlprogram",
com.example.aidlprogram.AdditionService.class.getName());
```

```
        boolean ret = bindService(i, connection,
Context.BIND_AUTO_CREATE);
        Log.d(TAG, "initService() bound with " + ret);
    }

    /** Unbinds this activity from the service. */
    private void releaseService() {
        unbindService(connection);
        connection = null;
        Log.d(TAG, "releaseService() unbound.");
    }

    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        initService();

        // Setup the UI
        Button buttonCalc = (Button) findViewById(R.id.btn_calculate);

        buttonCalc.setOnClickListener(new View.OnClickListener() {
            TextView result = (TextView) findViewById(R.id.txt_result);
            EditText value1 = (EditText)
findViewById(R.id.edtPrinciple);
            EditText value2 = (EditText)
findViewById(R.id.edtDownpayment);
            EditText value3 = (EditText)
findViewById(R.id.edtInterestRate);
            EditText value4 = (EditText)
findViewById(R.id.edtLoanTerm);
            public void onClick(View v) {
                int P,Dp,r, n;
                double res = 0;
                P = Integer.parseInt(value1.getText().toString());
                Dp = Integer.parseInt(value2.getText().toString());
                r = Integer.parseInt(value2.getText().toString());
                n = Integer.parseInt(value2.getText().toString());

//Toast.makeText(getApplicationContext(),String.valueOf(v1),Toast.LENGT
H_LONG).show();

//Toast.makeText(getApplicationContext(),String.valueOf(v2),Toast.LENGT
H_LONG).show();
                try {
                    res = service.add(P, r,n);
                } catch (RemoteException e) {
```

```
                    Log.d(TAG, "onClick failed with: " + e);
                    e.printStackTrace();
                }
                result.setText(String.valueOf(res));
            }
        });
    }

    /** Called when the activity is about to be destroyed. */
    @Override
    protected void onDestroy() {
        releaseService();
    }


}
```