Slip 2

Q1.Perfect number

```
<!-- activity_main.xml -->
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"     android:padding="16dp"
tools:context=".MainActivity">

   <EditText        android:id="@+id/editTextNumber1"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:hint="Enter Number 1"
android:inputType="numberDecimal" />

   <EditText        android:id="@+id/editTextNumber2"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_below="@id/editTextNumber1"
android:layout_marginTop="16dp"
android:hint="Enter Number 2"
android:inputType="numberDecimal" />

   <Button        android:id="@+id/buttonSubmit"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@id/editTextNumber2"
android:layout_marginTop="16dp"
android:text="Submit" />
```

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

</RelativeLayout>
```

MainActivity.java- package com.example.myapplication; import androidx.appcompat.app.AppCompatActivity;

```
import android.os.Bundle; import
android.view.View; import
android.widget.Button; import
android.widget.EditText; import
android.widget.TextView;


public class MainActivity extends AppCompatActivity {
```

```
    private EditText editTextNumber1;
private EditText editTextNumber2;     private
Button buttonSubmit;     private TextView
textViewResult;


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

        editTextNumber1         =         findViewById(R.id.editTextNumber1);
editTextNumber2             =             findViewById(R.id.editTextNumber2);
buttonSubmit = findViewById(R.id.buttonSubmit);         textViewResult =
findViewById(R.id.textViewResult);

        buttonSubmit.setOnClickListener(new
View.OnClickListener() {             @Override
            public void onClick(View v) {
submitNumbers();
            }
        });
    }

    private void submitNumbers() {
        String number1String = editTextNumber1.getText().toString().trim();
        String number2String = editTextNumber2.getText().toString().trim();

        if (number1String.isEmpty() || number2String.isEmpty()) {
textViewResult.setText("Please enter both numbers.");
```

```
            return;
        }

            double number1 = Double.parseDouble(number1String);        double
                    number2 = Double.parseDouble(number2String);

        if (number1 > 20 && number2 > 20) {
            textViewResult.setText("Both numbers are greater than
20. Please enter new numbers.");
            editTextNumber1.setText("");
editTextNumber2.setText("");            return;
        }

        textViewResult.setText("Number 1: " + number1 + "\nNumber 2: " +
number2);
    }
}
```

Q2. Java Android Program to perform all arithmetic Operations using Calculators.

Ans

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```
<!-- activity_calculator.xml -->
<RelativeLayout
```

```
xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="match_parent"
android:layout_height="match_parent"     android:padding="16dp">

   <TextView        android:id="@+id/textViewResult"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:textSize="24sp"
android:layout_marginBottom="16dp"
       android:text="0"
       android:textAlignment="textEnd"/>

   <GridLayout
       android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_below="@id/textViewResult"        android:columnCount="4"
android:orientation="horizontal">

       <Button            android:id="@+id/button0"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="0"
android:onClick="onButtonClick"/>

       <Button            android:id="@+id/button1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="1"
android:onClick="onButtonClick"/>
```

```
    <Button          android:id="@+id/button2"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="2"
android:onClick="onButtonClick"/>

    <Button
       android:id="@+id/button3"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:text="3"
android:onClick="onButtonClick"/>       <Button
android:id="@+id/button4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:text="4"
android:onClick="onButtonClick"/>
    <Button          android:id="@+id/button5"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="5"
android:onClick="onButtonClick"/>

    <Button          android:id="@+id/button6"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="6"
android:onClick="onButtonClick"/>

    <Button
```

```
        android:id="@+id/button7"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:text="7"
android:onClick="onButtonClick"/>       <Button
android:id="@+id/button8"
android:layout_width="wrap_content"
android:layout_height="wrap_content"          android:text="8"
android:onClick="onButtonClick"/>

    <Button          android:id="@+id/button9"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="9"
android:onClick="onButtonClick"/>

    <Button          android:id="@+id/buttonPlus"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
        android:text="+"          android:onClick="onButtonClick"/>

    <Button          android:id="@+id/buttonsubtraction"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
        android:text="-"          android:onClick="onButtonClick"/>

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

```
        android:text="×"          android:onClick="onButtonClick"/>

    <Button          android:id="@+id/buttondivision"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
        android:text="÷"          android:onClick="onButtonClick"/>

    <Button          android:id="@+id/buttonequal"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="="
android:onClick="onButtonClick"/>

    <Button          android:id="@+id/buttonclear"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="C"
android:onClick="onButtonClick"/>
  </GridLayout>
</RelativeLayout>
```

MainActivity.java-

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

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

```
public class CalculatorActivity extends AppCompatActivity {

    private TextView textViewResult;     private
String input = "";
    private double operand1 = Double.NaN;     private
double operand2 = Double.NaN;
    private String operator = "";

    @Override     protected void onCreate(Bundle
savedInstanceState) {         super.onCreate(savedInstanceState);
setContentView(R.layout.activity_calculator);         textViewResult
= findViewById(R.id.textViewResult);

    }

    public void onButtonClick(View view) {
        Button button = (Button) view;
        String buttonText = button.getText().toString();

        switch (buttonText) {
            case "C":
clear();
break;             case "+":
case "-":             case
"×":             case "÷":
                if (!input.isEmpty()) {
                    operand1 = Double.parseDouble(input);                    operator
= buttonText;
                    input = "";
```

```
            }
            break;
case "=":
            if (!Double.isNaN(operand1) && !input.isEmpty()) {
operand2 = Double.parseDouble(input);                    input =
String.valueOf(calculate());                    operand1 = Double.NaN;
                operand2 = Double.NaN;
                operator = "";
            }
break;
default:
            input += buttonText;
        }

        textViewResult.setText(input);
    }

    private void clear() {
input = "";
        operand1 = Double.NaN;        operand2 =
Double.NaN;
        operator = "";        textViewResult.setText("0");
    }

    private double calculate() {        switch
(operator) {            case "+":                return
operand1 + operand2;
            case "-":                return operand1 -
operand2;            case "×":
```

```
            return operand1 * operand2;
        case "÷":
            if (operand2 == 0) return Double.NaN; // handle division by
zero                return operand1 / operand2;            default:
            return Double.NaN;
    }
  }
}
```