**MainActivity.java**

package com.example.a5q7;

import androidx.appcompat.app.AppCompatActivity;

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

import android.widget.EditText;  
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {  
 EditText inputNumber;  
 TextView resultText;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);

inputNumber = findViewById(R.id.*inputNumber*);  
 resultText = findViewById(R.id.*resultText*);  
 }

public void calculate(View view) {  
 String numberStr = inputNumber.getText().toString();  
 if (!numberStr.isEmpty()) {  
 int number = Integer.*parseInt*(numberStr);

switch (view.getId()) {

case R.id.*btnFactorial*:  
 long factorialResult = calculateFactorial(number);  
 displayResult("Factorial: " + factorialResult);  
 break;  
 case R.id.*btnArmstrong*:

boolean armstrongResult = isArmstrong(number);  
 displayResult("Armstrong: " + armstrongResult);  
 break;  
 case R.id.*btnSumOfDigits*:  
 int sumOfDigitsResult = calculateSumOfDigits(number);  
 displayResult("Sum of Digits: " + sumOfDigitsResult);  
 break;  
 case R.id.*btnPerfectNumber*:  
 boolean perfectNumberResult = isPerfectNumber(number);  
 displayResult("Perfect Number: " + perfectNumberResult);  
 break;

}  
 } else {

displayResult("Please enter a number");  
 }  
 }  
 private long calculateFactorial(int n) {  
 if (n == 0 || n == 1) {  
 return 1;  
 }  
 return n \* calculateFactorial(n - 1);  
 }  
 private boolean isArmstrong(int n) {  
 int originalNumber = n;  
 int sum = 0;  
 while (n > 0) {  
 int digit = n % 10;

sum += Math.*pow*(digit, 3); // For a 3-digit Armstrong number  
 n /= 10;  
 }  
 return sum == originalNumber;  
 }  
 private int calculateSumOfDigits(int n) {  
 int sum = 0;  
 while (n > 0) {  
 sum += n % 10;  
 n /= 10;  
 }  
 return sum;  
 }  
 private boolean isPerfectNumber(int n) {  
 int sum = 1;  
 for (int i = 2; i \* i <= n; i++) {  
 if (n % i == 0) {  
 sum += i;

if (i != n / i) {

sum += n / i;  
 }  
 }  
 }  
 return sum == n;  
 }  
 private void displayResult(String result) {  
 resultText.setText(result);  
 }  
}