ADS Assignment-1

1. Write a Java program to check if a given number is an Armstrong number.

```
import java.util.Scanner;

class ArmstrongNumber {

	public static void main(String[] args) {

		Scanner sc = new Scanner(System.in);

		int num = sc.nextInt();
		int originalNum = num;

		int sum = 0;

		while(num != 0) {
			int a = num % 10;
			sum += a*a*a;
			num = num / 10;
		}

		if(originalNum == sum)
			System.out.println("true");
		else
			System.out.println("false");
	}
}
```

Output

```
D:\Practice\ADS\Assignment1>java ArmstrongNumber
153
true

D:\Practice\ADS\Assignment1>javac ArmstrongNumber.java

D:\Practice\ADS\Assignment1>java ArmstrongNumber
123
false
```

2. Write a Java program to check if a given number is prime.

```
import java.util.Scanner;

class PrimeNumber {

	public static void main(String[] args) {
```

```
		Scanner sc = new Scanner(System.in);
		int n = sc.nextInt();
		int flag = 0;

		for(int i = 2; i < n; i++) {
			if(n % i == 0) {
				flag = 0;
				break;
			} else {
				flag = 1;
			}
		}

		if (flag == 1)
			System.out.print("true");
		else
			System.out.println("false");
	}
}
```

Output

```
D:\Practice\ADS\Assignment1>java PrimeNumber
29
true
D:\Practice\ADS\Assignment1>javac PrimeNumber.java

D:\Practice\ADS\Assignment1>java PrimeNumber
15
false
```

3. Write a Java program to compute the factorial of a given number.

```
import java.util.Scanner;

class Factorial {

	public static void main(String[] args) {

		Scanner sc= new Scanner(System.in);

		int n = sc.nextInt();

		int product = 1;
```

```
        for (int i = 1; i <= n; i++) {
            product *= i;
        }
        System.out.println(product);
    }
}
```

Output

```
D:\Practice\ADS\Assignment1>javac Factorial.java

D:\Practice\ADS\Assignment1>java Factorial
5
120

D:\Practice\ADS\Assignment1>javac Factorial.java

D:\Practice\ADS\Assignment1>java Factorial
0
1
```

4. Write a Java program to print the first n numbers in the Fibonacci series.

```
import java.util.Scanner;

class Fibonacci {
    static int fib(int n) {
        if(n <= 1)
            return n;
        else
            return fib(n-1) + fib(n-2);
    }
    public static void main(String[] args) {
        Scanner sc= new Scanner(System.in);
        int n = sc.nextInt();
```

```
        for(int i = 0; i < n; i++) {

        System.out.print(fib(i) + " ");

        }

    }

}
```

Output

```
D:\Practice\ADS\Assignment1>javac Fibonacci.java

D:\Practice\ADS\Assignment1>java Fibonacci
5
0 1 1 2 3
D:\Practice\ADS\Assignment1>javac Fibonacci.java

D:\Practice\ADS\Assignment1>java Fibonacci
8
0 1 1 2 3 5 8 13
```

5. Write a Java program to find the Greatest Common Divisor (GCD) of two numbers.

```
import java.util.Scanner;

class GCD {

    static int gcd(int a, int b) {
        if(b == 0)
            return a;
        return gcd (b, a % b);
    }

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        int x = sc.nextInt();
        int y = sc.nextInt();

        System.out.println(gcd(x,y));
    }
}
```

Output

```
D:\Practice\ADS\Assignment1>javac GCD.java

D:\Practice\ADS\Assignment1>java GCD
54
24
6

D:\Practice\ADS\Assignment1>javac GCD.java

D:\Practice\ADS\Assignment1>java GCD
17
13
1
```

9. Write a Java program to check if a given integer is a palindrome.

```
import java.util.Scanner;

class Palindrome {

	public static void main(String[] args) {

		Scanner sc = new Scanner(System.in);
		int num = sc.nextInt();

		int revNum = 0;

		int temp = num;
		while(temp > 0) {
			revNum = (revNum*10) + (temp % 10);
			temp = temp / 10;
		}

		if(num == revNum)
			System.out.println("true");
		else
			System.out.println("false");
	}
}
```

Output

```
D:\Practice\ADS\Assignment1>javac Palindrome.java

D:\Practice\ADS\Assignment1>java Palindrome
121
true

D:\Practice\ADS\Assignment1>javac Palindrome.java

D:\Practice\ADS\Assignment1>java Palindrome
-121
false
```

10. Write a Java program to check if a given year is a leap year.

```
import java.util.Scanner;
class LeapYear {
	public static void main(String[] args) {
		Scanner sc = new Scanner(System.in);
		int year = sc.nextInt();
		if(year % 400 == 0)
			System.out.println("ture");
		else if(year % 100 == 0)
			System.out.println("false");
		else if(year % 4 == 0)
			System.out.println("true");
		else
			System.out.println("false");
	}
}
```

Output

```
D:\Practice\ADS\Assignment1>javac LeapYear.java

D:\Practice\ADS\Assignment1>java LeapYear
2020
true

D:\Practice\ADS\Assignment1>javac LeapYear.java

D:\Practice\ADS\Assignment1>java LeapYear
1900
false
```