# OOAD With Java Lab Week -1

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| | Date: 21.1.2022 | Exercise No: 1 |

## Problem Statement - 1

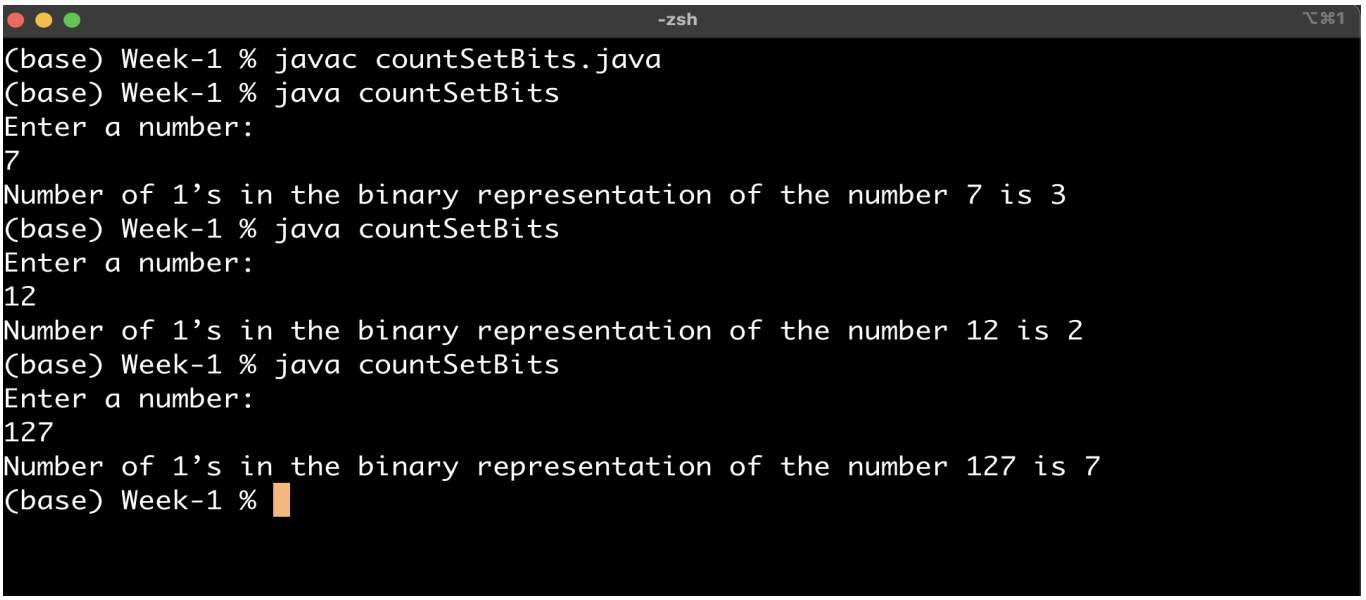
Input a number from the user and display the number of 1's in the binary representation of a number

## Code :

```
// Input a number from the user
// and display the number of 1's in the binary representation of the number

public class countSetBits
{
   public static void main(String[] args)
   {
       int n, count = 0;
       System.out.println("Enter a number: ");
       n = Integer.parseInt(System.console().readLine());
       while(n > 0)
       {
           if(n % 2 == 1)
               count++;
           n = n / 2;
       }
       System.out.println("Number of 1's in the binary representation of the number + " + n +
" is " + count);
   }
}
```

## Output with Test cases 7,12,121 :



**Problem Statement - 2**

Write a program to find surface area of a cylinder: 2PIr*r+2PIr*h
(Hint: Use Math.PI)

**Code :**

```java
// Write a program to find surface area of a cylinder: 2PIr*r+2PIr*h
// Hint: Use Math.PI

public class surfaceArea
{
   public static void main(String[] args)
   {
       // accepting radius and height from user
       System.out.println("Enter radius: ");
       double r = Double.parseDouble(System.console().readLine());
       System.out.println("Enter height: ");
       double h = Double.parseDouble(System.console().readLine());
       double area = 2 * Math.PI * r * (r + h);
       System.out.println("Surface area of a cylinder with radius " + r + " and height " + h +
" is " + area);
   }
}
```

**Output with test cases : (r=5, h=5), (r=12, h=13), (r=2, h=4)**

```
-zsh
(base) Week-1 % javac surfaceArea.java
(base) Week-1 % java surfaceArea
Enter radius:
5
Enter height:
5
Surface area of a cylinder with radius 5.0 and height 5.0 is 314.1592653589793
(base) Week-1 % java surfaceArea
Enter radius:
12
Enter height:
13
Surface area of a cylinder with radius 12.0 and height 13.0 is 1884.955592153875
8
(base) Week-1 % java surfaceArea
Enter radius:
2
Enter height:
4
Surface area of a cylinder with radius 2.0 and height 4.0 is 75.39822368615503
(base) Week-1 %
```

## Problem Statement - 3

Create a class called MyNumber as shown below. To this class, add a method to count the number of bits which are 1 in the binary representation of the number. Use the concept of package creation and importing the package

```
class MyNumber  {
        private int value;
        // display method
 }
```

**Code :**

```
// Create a class called MyNumber as shown below. To this class, add  a method to count the number of bits which are 1 in the binary representation of the number. Use the concept of package creation and importing the package
// class MyNumber  {
//   private int value;
//   // ctor
//   // display method
// }

package ThirdProgramPackage;

public class myNumber {
   private int value;

   public myNumber(int value) {
       this.value = value;
   }

   public int countBits() {
       int count = 0;
       while (value != 0) {
           if ((value & 1) == 1) {
               count++;
           }
           value = value >> 1;
       }
       return count;
   }
}
```

```
import ThirdProgramPackage.myNumber;
public class myNumberDriver {

   public static void main(String[] args) {
       // take input from user
       System.out.println("Enter a number: ");
       int num = Integer.parseInt(System.console().readLine());
       myNumber n = new myNumber(num);
       System.out.println("Number of 1's in the binary representation of " + num + " is " + n.countBits());
   }
}
```

**Output with Test cases 5, 255, 1024**