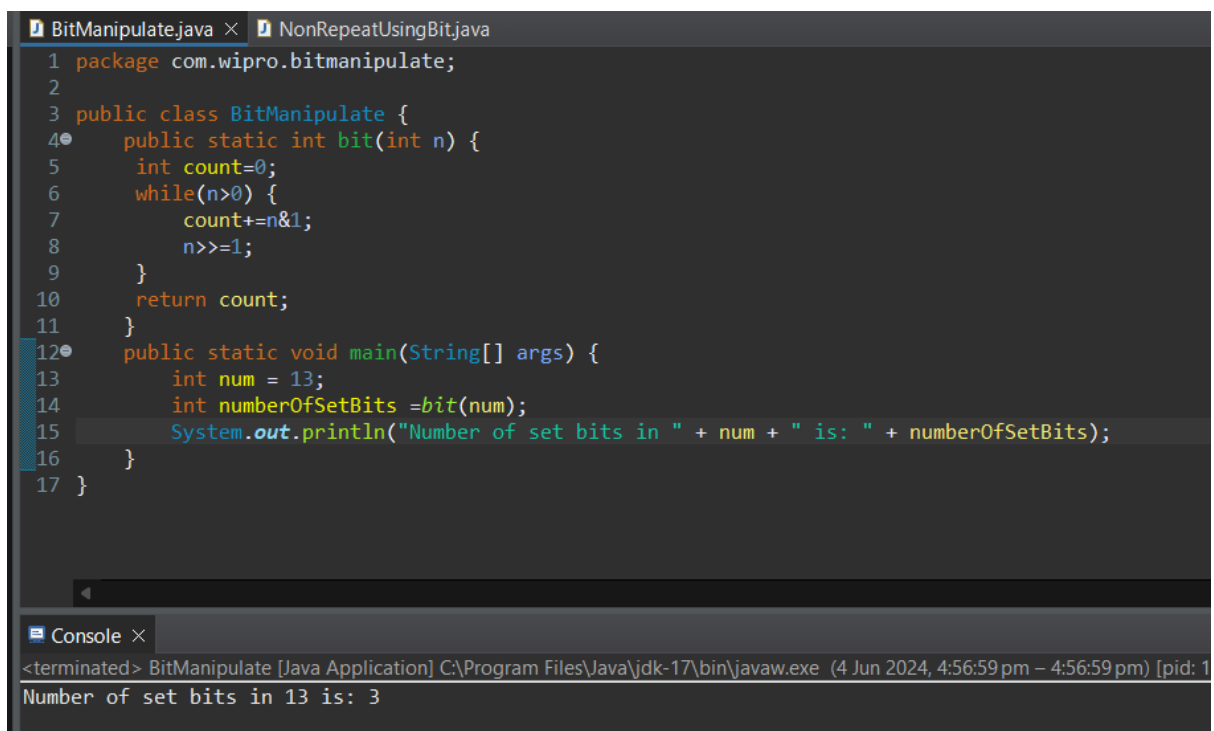


DAY-12 JAVA ASSIGNMENT

Day 12:

Task 1: Bit Manipulation Basics

Create a function that counts the number of set bits (1s) in the binary representation of an integer. Extend this to count the total number of set bits in all integers from 1 to n.



```
BitManipulate.java × NonRepeatUsingBit.java
1 package com.wipro.bitmanipulate;
2
3 public class BitManipulate {
4     public static int bit(int n) {
5         int count=0;
6         while(n>0) {
7             count+=n&1;
8             n>>=1;
9         }
10        return count;
11    }
12    public static void main(String[] args) {
13        int num = 13;
14        int numberOfSetBits =bit(num);
15        System.out.println("Number of set bits in " + num + " is: " + numberOfSetBits);
16    }
17 }
```

```
Console ×
<terminated> BitManipulate [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (4 Jun 2024, 4:56:59 pm – 4:56:59 pm) [pid: 1
Number of set bits in 13 is: 3
```

Task 2: Unique Elements Identification

Given an array of integers where every element appears twice except for two, write a function that efficiently finds these two non-repeating elements using bitwise XOR operations.

```
NonRepeatUsingBit.java ×
1 package com.wipro.bitmanipulate;
2
3 public class NonRepeatUsingBit {
4     public static void findNonRepeatingElements(int[] arr) {
5
6         int xorResult = 0;
7         int x = 0;
8         int y = 0;
9         for (int num : arr) {
10             xorResult ^= num;
11         }
12         int rightmostSetBit = xorResult & -xorResult;
13
14         for (int num : arr) {
15             if ((num & rightmostSetBit) != 0) {
16                 x ^= num;
17             } else {
18                 y ^= num;
19             }
20         }
21
22         System.out.println("Non-repeating elements are: " + x + " and " + y);
23     }
24
25     public static void main(String[] args) {
26         int[] arr = { 2, 4, 7, 9, 2, 4, 5, 7 };
27         findNonRepeatingElements(arr);
28     }
29 }
```

```
Console ×
<terminated> NonRepeatUsingBit [Java Application] C:\Program Files\Java\jdk-17\bin\javaw.exe (4 Jun 2024, 4:58:04 pm)
Non-repeating elements are: 5 and 9
```