

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.

```
1 package bitmanipulate;
2
3 public class BitManipulation {
4
5     public static int bit(int n) {
6         int count=0;
7         while(n>0) {
8             count+=n&1;
9             n>>=1;
10        }
11        return count;
12    }
13
14    public static void main(String[] args) {
15        int num = 13;
16        int numberOfSetBits =bit(num);
17        System.out.println("Number of set bits in " + num + " is: " + numberOfSetBits);
18    }
19 }
```

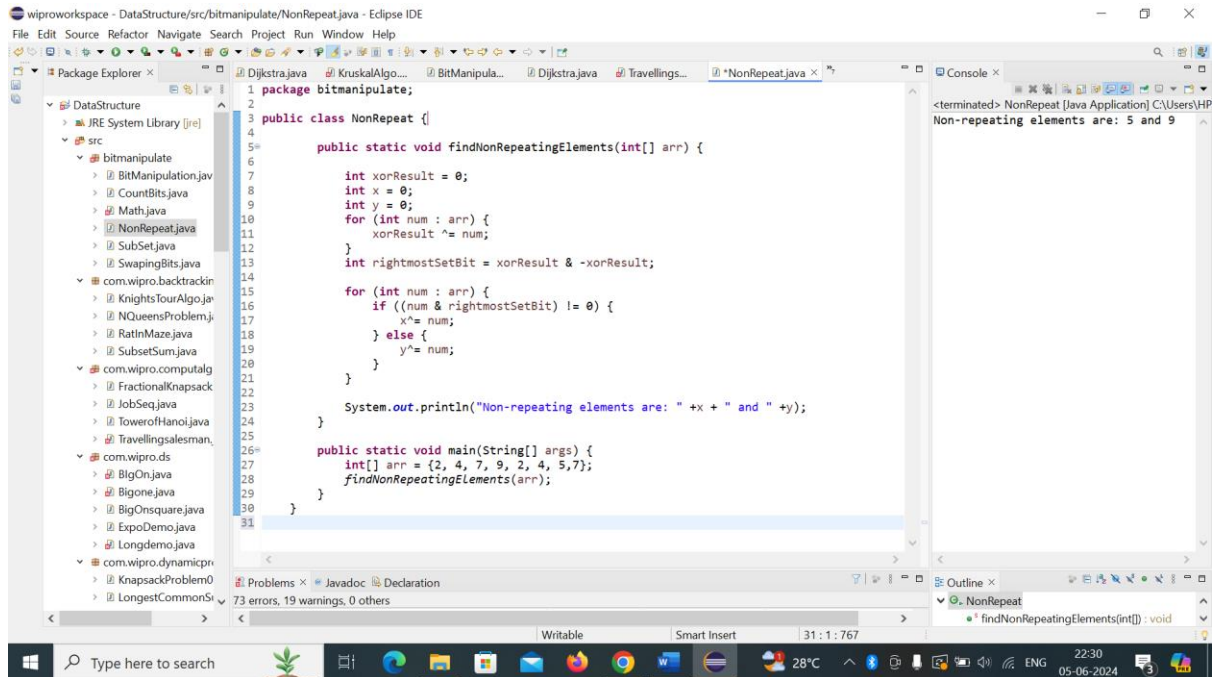
<terminated> BitManipulation (1) [Java Application] C:\U
Number of set bits in 13 is: 3

main(String[]) : void

73 errors, 19 warnings, 0 others

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.



The screenshot shows the Eclipse IDE with a project named 'wiproworkspace'. The package explorer on the left shows a package 'bitmanipulate' containing several Java files, including 'NonRepeat.java'. The main editor displays the code for 'NonRepeat.java'.

```
1 package bitmanipulate;
2
3 public class NonRepeat {
4
5     public static void findNonRepeatingElements(int[] arr) {
6
7         int xorResult = 0;
8         int x = 0;
9         int y = 0;
10        for (int num : arr) {
11            xorResult ^= num;
12        }
13        int rightmostSetBit = xorResult & -xorResult;
14
15        for (int num : arr) {
16            if ((num & rightmostSetBit) != 0) {
17                x ^= num;
18            } else {
19                y ^= num;
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 }
30
31
```

The console on the right shows the output of the program: "Non-repeating elements are: 5 and 9". The status bar at the bottom indicates 73 errors, 19 warnings, and 0 others.