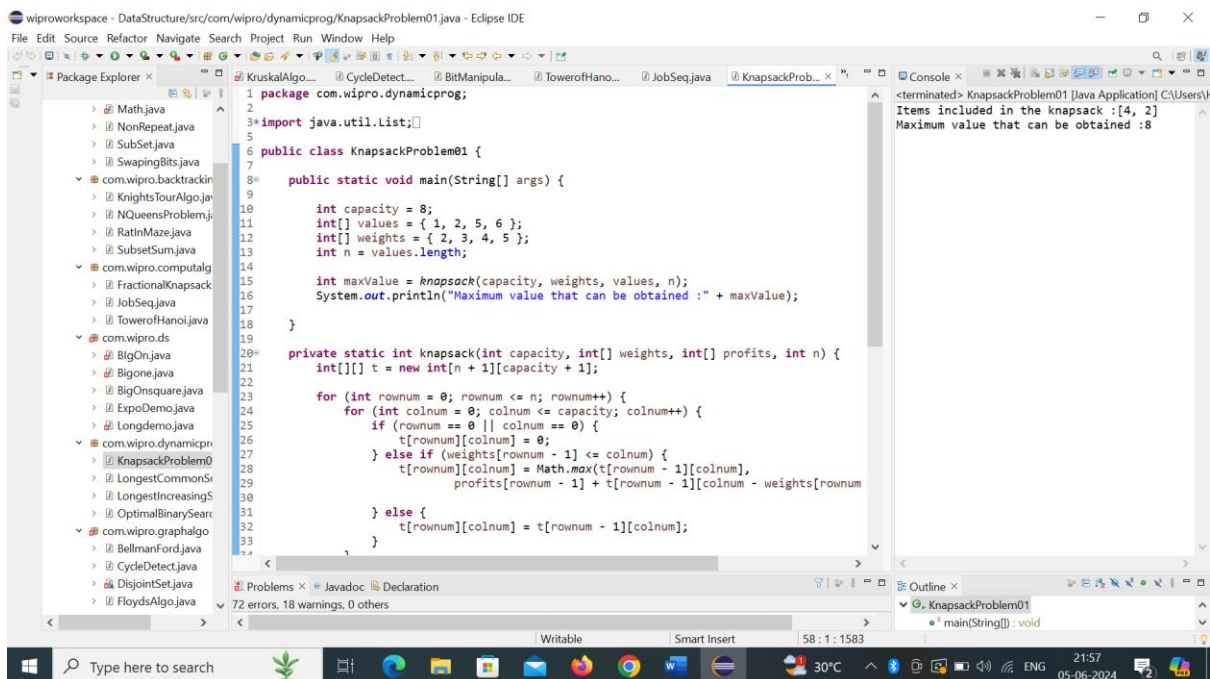


Day 15 and 16

Task 1: Knapsack Problem

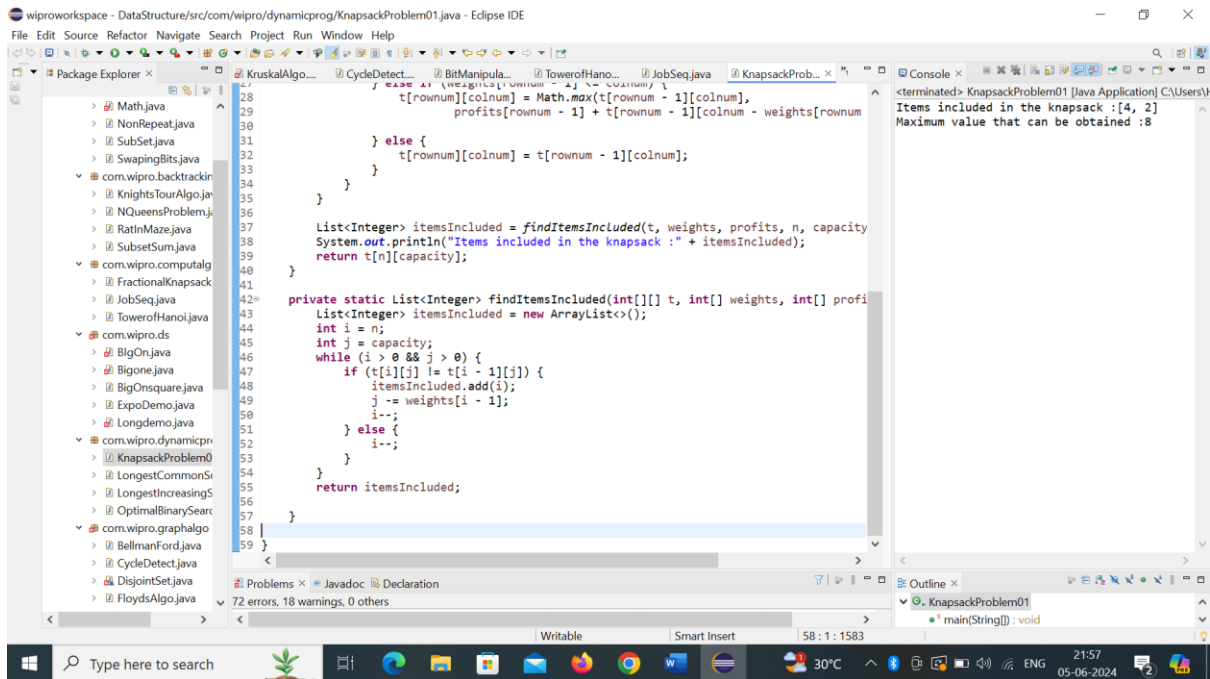
Write a function `int Knapsack(int W, int[] weights, int[] values)` in C# that determines the maximum value of items that can fit into a knapsack with a capacity `W`. The function should handle up to 100 items. Find the optimal way to fill the knapsack with the given items to achieve the maximum total value. You must consider that you cannot break items, but have to include them whole.



```
1 package com.wipro.dynamicprog;
2
3 import java.util.List;
4
5
6 public class KnapsackProblem01 {
7
8     public static void main(String[] args) {
9
10         int capacity = 8;
11         int[] values = { 1, 2, 5, 6 };
12         int[] weights = { 2, 3, 4, 5 };
13         int n = values.length;
14
15         int maxValue = knapsack(capacity, weights, values, n);
16         System.out.println("Maximum value that can be obtained : " + maxValue);
17     }
18
19     private static int knapsack(int capacity, int[] weights, int[] profits, int n) {
20         int[][] t = new int[n + 1][capacity + 1];
21
22         for (int rownum = 0; rownum <= n; rownum++) {
23             for (int colnum = 0; colnum <= capacity; colnum++) {
24                 if (rownum == 0 || colnum == 0) {
25                     t[rownum][colnum] = 0;
26                 } else if (weights[rownum - 1] <= colnum) {
27                     t[rownum][colnum] = Math.max(t[rownum - 1][colnum],
28                         profits[rownum - 1] + t[rownum - 1][colnum - weights[rownum - 1]]);
29                 } else {
30                     t[rownum][colnum] = t[rownum - 1][colnum];
31                 }
32             }
33         }
34     }
35 }
```

Console Output:

```
<terminated> KnapsackProblem01 [Java Application] C:\Users\H...
Items included in the knapsack :[4, 2]
Maximum value that can be obtained :8
```



Task 2: Longest Common Subsequence

Implement `int LCS(string text1, string text2)` to find the length of the longest common subsequence between two strings.

