Introduction to Algorithms Assignment3

Due Date: 2020/01/07 12:00:00

Resource Allocation Problem

- ✓ Given m resources and n projects, a profit(i, j) will be obtained if j, $\mathbf{0} \leq \boldsymbol{j} \leq \boldsymbol{m}$, resources are allocated to project i.
- ✓ Find an allocation of resources to maximize the total profit.
- ✓ Must use dynamic programming approach to design an algorithm and implement the program to solve the resource allocation problem.

e.g. You have 7 days to study four courses. Each course should study **AT LEAST** 1 day, and **NO** course can be studied twice. How to plan your schedule to get the highest score?

Days to study	course			
	1	2	3	4
1	3	4	3	6
2	6	6	4	7
3	7	9	8	9
4	8	11	9	10

Answer: max score is 24.

P.S. If you study course 1 two days, you will get 6 points.

Input:
3 4 3 6
6 6 4 7
7 9 8 9
8 11 9 10 (Profit table **1**)

7 (Days for studying; corresponding data as for Profit table **1**)

5 (Days for studying; corresponding data as for Profit table **1**)

3 4 3
6 6 4
7 9 8
8 11 9 (Profit table **2**)

6 (Days for studying; corresponding data as for Profit table **2**)

4 (Days for studying; corresponding data as for Profit table **2**)

Output:
24 (6+9+3+6)
19 (6+4+3+6)
18 (6+9+3)
13 (6+4+3)

Rule of programing and the dataset:
(1) Resources is larger than number of plans (Because one plan need to choose once)
(2) One profit table may contain more than one allocation problem
(3) All element type is positive Integer.
(4) Cannot use not standard header file(e.g <bits/stdc++>) or you should attach on your zip
(5) Input file and output display automatically and the relative path is beside the main program.