

# Introduction to Algorithms Assignment3

Due Date: 2019/01/04 12:00:59

## Resource Allocation Problem

- ✓ Given  $m$  resources and  $n$  projects, a profit(  $i, j$ ) will be obtained if  $j, 0 \leq j \leq m$ , resources are allocated to project  $i$ .
- ✓ Find an allocation of resources to maximize the total profit.
- ✓ Please 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.** 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)

7(resource)

3 4 3

6 6 4

7 9 8

8 11 9

6

**Output:**

24(6+9+3+6)

18(6+9+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 and output txt file automatically and the relative path is beside the main program