CSE2011 Problem Solving, 2016 Spring

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Homework 6 (80 points): 2016/5/26

Due date: 2016/6/7 23:59 (submission to icampus)

Problem 6-1: Elevator Optimization 2 (50 points)

- Read the elevator optimization problem in Pages 253-256. We change the problem such that

    1. People can walk down but cannot walk up; and
    2. The 1st floor is the base floor.

- Sample input (the red numbers are input)

    5 (number of people <= MAX_RIDER=50)

    3 (number of stops <= MAX_STOP = 50)

    3 (the floor on which Person 1's home is located <= NFLOORS=100)

    16 (the floor on which Person 2's home is located <= NFLOORS=100)

    2 (the floor on which Person 3's home is located <= NFLOORS=100)

    10 (the floor on which Person 4's home is located <= NFLOORS=100)

    15 (the floor on which Person 5's home is located <= NFLOORS=100)

- Sample output (the red numbers are output)

  3 (the floor on which Person 1 gets off)

  16 (the floor on which Person 2 gets off)

  3 (the floor on which Person 3 gets off)

  10 (the floor on which Person 4 gets off)

  16 (the floor on which Person 5 gets off)

In your code

- Insert comments.
- TA will test your program in http://ideone.com/

In your report

- Explain your solution idea (algorithm) with an example.
- Explain your code.

Problem 6-2: Land Lease (30 points)

- You are going to lease a piece of land. For each unit of land, you should pay X amount of fee, and you will earn some money from the land.
- Develop an algorithm that finds a rectangle maximizing your profit.
- Example: *X=100,*

110	**130**	**80**	**170**	**160**
150	**120**	**170**	**160**	**90**
110	**190**	**180**	**120**	**30**
10	**80**	**110**	**130**	**140**
120	**130**	**30**	**120**	**90**
60	**120**	**80**	**100**	**50**

- Then, your maximum profit is 490, when the rectangle (1,1) – (3,4) (colored as grey) is chosen. In this case, the amount of profit is
- 110+130+80+170+150+120+170+160+110+190+180+120 – 100*12= 490

110	***130***	***80***	***170***	***160***
150	***120***	***170***	***160***	***90***
110	***190***	***180***	***120***	***30***
10	***80***	***110***	***130***	***140***
120	***130***	***30***	***120***	***90***
60	***120***	***80***	***100***	***50***

In your code

- No code

In your report

- Explain your algorithm.

- Explain your algorithm with the following example with X=150.

120	140	60	200	260	240	110	260	150	200
90	20	90	110	70	130	20	110	100	110
30	260	170	230	20	230	110	130	90	20
240	130	40	80	150	90	230	230	130	260
70	110	80	100	20	290	40	30	110	40
150	260	150	190	170	170	260	140	260	110
50	210	160	140	150	90	130	150	130	170
100	140	190	260	110	170	110	170	140	20
140	60	120	230	170	130	260	230	150	170
190	50	40	100	270	90	20	290	240	100