

## CS-205, Assignment –VI

Assignment Date: 04/08/2017

Submission Deadline: 10/09/2017

- A. Given a list of  $N$  coins, their values  $(V_1, V_2, \dots, V_N)$ , and the total sum  $S$ . Write a dynamic programming to find the minimum number of coins the sum of which is  $S$  (we can use as many coins of one type as we want), or report that it's not possible to select coins in such a way that they sum up to  $S$ . When solution is possible also provide exact number of coins of each denomination.

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- B. You have to enter into puzzler's house. Puzzler's house contains  $(m*n)$  numbers of rooms. Where  $m$  is the number of rows and  $n$  is the number of columns. Rooms are arranged in  $m$  by  $n$  matrix like structure. Your want to reach room  $(m,n)$  starting from room  $(0,0)$  in minimum cost. There is a cost associated with every room (take it as input). You are allowed to move downward, rightward or diagonally. For example from room  $(i,j)$  you can reach to room  $(i+1,j)$  or  $(i,j+1)$  or  $(i+1,j+1)$ . Write a dynamic programming to find out the total minimum cost and the required move at each step.

Example Input:

Value of  $m=4$  and  $n=3$  and cost corresponding to each room is given in matrix format

row	column	0	1	2
0		1	2	4
1		10	5	7
2		12	9	3
3		6	4	7

Output:

Total cost:  $1+5+3+7=16$

Move: diagonal, diagonal, downward

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- C. You have a set of  $n$  integers. Write a dynamic programming which finds two sets (Set1 and Set2) from these  $n$  integers such that it minimizes difference between  $|\text{Sum}(\text{Set1}) - \text{Sum}(\text{Set2})|$ , where  $\text{Sum}(S)$  denotes sum of all elements belong to set  $S$ .

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