

COP 3503 Recitation Worksheet - Dynamic Programming

1) Find the length of the longest common subsequence between “GACATATAGGA” and “AGCATTACGAG” utilizing the dynamic programming algorithm shown in class. In order to get full credit, you have to fill in the matrix provided below.

2) Utilize the dynamic programming algorithm shown in class to solve the 0-1 knapsack problem to determine the most valuable knapsack of weight 13 utilizing the items below:

Item	Weight	Value
A	5	107
B	3	60
C	6	140
D	2	35
E	8	180
F	4	93

3) Determine the number of ways to make change for 11 cents using 2 cent, 3 cent, 4 cent and 7 cent coins. In order to get full credit, please complete the chart below using the algorithm shown in class.

Num Cents	1	2	3	4	5	6	7	8	9	10	11
Max Coin											
2											
3											
4											
7											

4) Determine the fewest number of coins to make change for 11 cents using 2 cent, 3 cent, 4 cent and 7 cent coins. In order to get full credit, please complete the chart below using the algorithm shown in class.

Num Cents	1	2	3	4	5	6	7	8	9	10	11
Max Coin											
2											
3											
4											
7											

5) (Note: Leave this for one week later. I left it on the sheet so that you all still had the practice problem.) Determine the fewest number of multiplications to calculate the product ABCDE, for matrices A, B, C, D, E with the following dimensions:

Matrix	Dimensions
A	2x6
B	6x1
C	1x3
D	3x5
E	5x2

In order to get full credit you must fill out the chart below appropriately, as shown in class. Please include your calculations below the chart.

	A	B	C	D	E
A	0				
B	X	0			
C	X	X	0		
D	X	X	X	0	
E	X	X	X	X	0