Name: *Alexander Molodyh* V# V00342973

Take home quiz. The quiz is open books, notes, and Internet. The quiz is not open to peers (in or not in in the class now)

1. You are given the input p = <20, 25, 30, 5, 8, 4, 10>, populate the m and s arrays according to the MATRIC-CHAIN-ORDER(p) algorithm given on slide #10 (6 points).

m array

1	2	3	4	5	6	
0	15000	6,250	7050	5760	6560	1
	0	3750	4,750	3760	4760	2
		0	1200	760	1860	3
			0	160	360	4
				0	320	5
					0	6

s array

1	2	3	4	5	6	
	1	1	3	1	5	1
		2	3	2	5	2
			3	3	3	3
				4	5	4
					5	5
						6

2. You are given the input p = <20, 8, 4, 25, 30, 5, 10>, populate the m array according to the Memoized Matrix Chain algorithm given on slide #25 (4 points).

0	640	2640	6040	4560	5240
	0	800	3960	3760	4120
		0	3000	3600	3800
			0	3750	5000
				0	1500
					0

3. Following the 0/1 knapsack problem on slide 11 of the greedy algorithms slides to solve the following problem: (4 points). The sack's weight limit is 10. That is w = 10 (7 points).

Item	w_i	v_i
I_1	4	6
I_2	2	4
I_3	3	5
I_4	1	3
I_5	6	9
I_6	4	7

Item	0	1	2	3	4	5	6	7	8	9	10
1	0	0	0	0	6	6	6	6	6	6	6
2	0	0	4	4	6	6	10	10	10	10	10
3	0	0	4	5	6	9	10	11	11	15	15
4	0	3	4	7	8	9	12	13	14	15	18
5	0	3	4	4	8	9	12	13	14	16	18
6	0	3	4	7	8	10	12	14	15	16	19

4. If the problem described in problem is reclassified as a fractional knapsack one. What is the total value carried out by a sack of capacity 10? Show the problem solving process (3 points).

Reorder in ascending order by weight

item	W	V	V/W
4	1	3	3
2	2	4	2
6	4	7	1.75
3	3	5	1.66
1	4	6	1.5
5	6	9	1.5

Knapsack Weight is=10

W=10

item	Weight	Value	Total weight	Benefit
4	1	3	1	3
2	2	4	3	7
6	4	7	7	14
3	3	5	10	19

I=item

I_4 W1, V3

$I_4 + I_2$ weight 1+2=3 Value 3+4=7

$I_4 + I_2 + I_6$ Weight 3+4=7 Value 7+7=14

$I_4 + I_2 + I_6 + I_3$ weight 7+3=10 Value 14+5=19