

## WA5 - Assignment Group 16

Sravani Kirla - skirla

Matthew Heil - heilx069

Terrence Hanrahan - hanra028

1.

Rod length (i)	1	2	3	4	5	6	7	8	9	10
Price per inch $P_i$	1	5	8	9	10	17	17	20	24	30
Density ( $p_i/i$ )	1	2.5	2.67	2.25	2	2.83	2.43	2.5	2.67	3

\* Length and Price values are based on figure 15.1 of text book.

Example:

If we consider a rod length of 4 ( $n=4$ ) and apply greedy strategy, we will get below values.

Maximum density of first cut piece for a given rod length can be considered as 2.67 from above table.

$n = 4 \Rightarrow i + (n-i) \Rightarrow 3 + 1 = 4 \Rightarrow \text{revenue} = 8+1 = 9$  ( which is the same revenue as uncut rod).

Clearly it is not the optimal solution as cut pieces 2+2 yields more revenue for a rod length of 4  
 $\text{revenue}(\text{cut piece length } 2) + \text{revenue}(\text{cut piece length } 2) \Rightarrow 5+5 = 10$ .

2.

$A_1 = 5 \times 20$ ,  $A_2 = 20 \times 1$ ,  $A_3 = 1 \times 2$ ,  $A_4 = 2 \times 10$

i				
j	Split	1	2	3
	4	2	2	3
	3	2	2	
	2	1		

## WA5 - Assignment Group 16

i					
j	Mult	1	2	3	4
	4	170	220	20	0
	3	110	40	0	
	2	100	0		
	1	0			

Optimal parenthesization of a matrix-chain product for  $A_1, A_2, A_3$  and  $A_4$  is  **$((A_1 A_2)(A_3 A_4))$**  whose sequence dimensions are (5, 20, 1, 2, 10).

3. Maximum number class can be scheduled as shown in below order using the greedy algorithm.

1. CSCI 3937 → 8:30am - 9:30 am
2. CSCI 4932 → 10 - 11:30 am
3. CSCI 5394 → 11:30am - 1:30pm
4. CSCI 9135 → 2 - 3:30pm