1) Dada a sequência de dimensões $\langle 5, 10, 3, 12, 5, 50, 6 \rangle$ e a recorrência:

$$m[i,j] = \begin{cases} 0 & \text{se } i \geq j \\ \min\limits_{i \leq k < j} \{ m[i,k] + p[i-1] \cdot p[k] \cdot p[j] + m[k+1, j] \} & \text{C.C} \end{cases}$$

1 2
m[1, 1]+ m[2, 2] + P0* P1 * P2 = 150 ✓
K = 1
2 3
m[2, 2]+ m[3, 3] + P1* P2 * P3 = 360 ✓
K = 2
3 4
m[3, 3]+ m[4, 4] + P2* P3 * P4 = 180 ✓
K = 3
4 5
m[4, 4]+ m[5, 5] + P3* P4 * P5 = 3000 ✓
K = 4
5 6
m[5, 5]+ m[6, 6] + P4* P5 * P6 = 1500 ✓
K = 5

5	P_0	1
10	P_1	2
3	P_2	3
12	P_3	4
5	P_4	5
50	P_5	6
6	P_6	7

	1	2	3	4	5	6
1	0	150				
2	0	0	360			
3	0	0	0	180		
4	0	0	0	0	3K	
5	0	0	0	0	0	1,5K
6	0	0	0	0	0	0
7	0	0	0	0	0	0

1 3
m[1, 1]+ m[2, 3] + P0* P1 * P3 = 960
m[1, 2]+ m[3, 3] + P0* P2 * P3 = 330 ✓
K = 2
2 4
m[2, 2]+ m[3, 4] + P1* P2 * P4 = 330 ✓
m[2, 3]+ m[4, 4] + P1* P3 * P4 = 960
K = 2
3 5
m[3, 3]+ m[4, 5] + P2* P3 * P5 = 4800
m[3, 4]+ m[5, 5] + P2* P4 * P5 = 930 ✓
K = 4
4 6
m[4, 4]+ m[5, 6] + P3* P4 * P6 = 1860 ✓
m[4, 5]+ m[6, 6] + P3* P5 * P6 = 6600
K = 4

5	P_0
10	P_1
3	P_2
12	P_3
5	P_4
50	P_5
6	P_6

	1	2	3	4	5	6
1	0	150	330			
2	0	0	360	330		
3	0	0	0	180	930	
4	0	0	0	0	3K	1860
5	0	0	0	0	0	1,5K
6	0	0	0	0	0	0
7	0	0	0	0	0	0

1 4

m[1, 1]+ m[2, 4] + P0* P1 * P4 = 580

m[1, 2]+ m[3, 4] + P0* P2 * P4 = 405 ✓

m[1, 3]+ m[4, 4] + P0* P3 * P4 = 630

2 5 K = 2

m[2, 2]+ m[3, 5] + P1* P2 * P5 = 2430 ✓

m[2, 3]+ m[4, 5] + P1* P3 * P5 = 9360

m[2, 4]+ m[5, 5] + P1* P4 * P5 = 2830

3 6 K = 2

m[3, 3]+ m[4, 6] + P2* P3 * P6 = 2076

m[3, 4]+ m[5, 6] + P2* P4 * P6 = 1770 ✓

m[3, 5]+ m[6, 6] + P2* P5 * P6 = 1830

K = 4

5	P_0
10	P_1
3	P_2
12	P_3
5	P_4
50	P_5
6	P_6

	1	2	3	4	5	6
1	0	150	330	405		
2	0	0	360	330	2430	
3	0	0	0	180	930	1770
4	0	0	0	0	3K	1860
5	0	0	0	0	0	1,5K
6	0	0	0	0	0	0
7	0	0	0	0	0	0

1 5

m[1, 1]+ m[2, 5] + P0* P1 * P5 = 4930

m[1, 2]+ m[3, 5] + P0* P2 * P5 = 1830

m[1, 3]+ m[4, 5] + P0* P3 * P5 = 6330

m[1, 4]+ m[5, 5] + P0* P4 * P5 = 1655 ✓

K = 4

2 6

m[2, 2]+ m[3, 6] + P1* P2 * P6 = 1950 ✓

m[2, 3]+ m[4, 6] + P1* P3 * P6 = 2940

m[2, 4]+ m[5, 6] + P1* P4 * P6 = 2130

m[2, 5]+ m[6, 6] + P1* P5 * P6 = 5430

K = 2

5	P_0
10	P_1
3	P_2
12	P_3
5	P_4
50	P_5
6	P_6

	1	2	3	4	5	6
1	0	150	330	405	1655	
2	0	0	360	330	2430	1950
3	0	0	0	180	930	1770
4	0	0	0	0	3K	1860
5	0	0	0	0	0	1,5K
6	0	0	0	0	0	0
7	0	0	0	0	0	0

1 6

m[1, 1]+ m[2, 6] + P0* P1 * P6 = 2250

m[1, 2]+ m[3, 6] + P0* P2 * P6 = 2010 ✓

m[1, 3]+ m[4, 6] + P0* P3 * P6 = 2550

m[1, 4]+ m[5, 6] + P0* P4 * P6 = 2055

m[1, 5]+ m[6, 6] + P0* P5 * P6 = 3155

K = 2

5	P_0
10	P_1
3	P_2
12	P_3
5	P_4
50	P_5
6	P_6

	1	2	3	4	5	6
1	0	150	330	405	1655	2010
2	0	0	360	330	2430	1950
3	0	0	0	180	930	1770
4	0	0	0	0	3K	1860
5	0	0	0	0	0	1,5K
6	0	0	0	0	0	0
7	0	0	0	0	0	0

O valor de K destacado representa o índice, no vetor de dimensões, do menor valor obtido ao calcularmos as recorrências. Obtemos:

	1	2	3	4	5	6
1	0	1	2	2	4	2
2	0	0	2	2	2	2
3	0	0	0	3	4	4
4	0	0	0	0	4	4
5	0	0	0	0	0	5
6	0	0	0	0	0	0
7	0	0	0	0	0	0

5	P_0
10	P_1
3	P_2
12	P_3
5	P_4
50	P_5
6	P_6

Com essa matriz, vemos que o grupo final da parentização tem $K = 2$, que equivale à $P_K = 3$, então a última multiplicação é $5 \times 3 \cdot 3 \times 6$, então:

$$5 \times 6 = 5 \times 3 \cdot 3 \times 6$$
$$= (5 \times 10 \cdot 10 \times 3) \cdot (3 \times 5 \cdot 5 \times 6)$$
$$= ((5 \times 10 \cdot 10 \times 3) \cdot ((3 \times 12 \cdot 12 \times 5) \cdot (5 \times 50 \cdot 50 \cdot 6)))$$

Achamos a parentização ótima.