

MATRIX-CHAIN-ORDER(p)

$p = [p_0, p_1, p_2, \dots, p_{n-1}, p_n]$   
 $\underbrace{p_0, p_1}_{A_1}, \underbrace{p_2, p_3}_{A_2}, \dots, \underbrace{p_{n-1}, p_n}_{A_n}$

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1  n = p.length - 1
2  let m[1..n, 1..n] and s[1..n-1, 2..n] be new tables
3  for i = 1 to n
4      m[i, i] = 0
5  for l = 2 to n          // l is the chain length
6      for i = 1 to n - l + 1
7          j = i + l - 1
8          m[i, j] = ∞
9          for k = i to j - 1
10             q = m[i, k] + m[k + 1, j] + p[i-1]p_kp_j
11             if q < m[i, j]
12                 m[i, j] = q
13                 s[i, j] = k
14  return m and s
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$p = [30, 35, 15, 5, 10, 20, 25]$

$\min(m[i, j])$

matris	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>	A <sub>6</sub>
dim	30x35	35x15	15x5	5x10	10x20	20x25
	$p_0 \ p_1$	$p_2$	$p_3$			

	1	2	3	4	5	6
1	○	15125	2875			
2		○	2625	4375	7125	
3			○	750	2500	
4				○	1000	3500
5					○	5000
6						○

$l=2$  ve  $i=1$  için  
 $j=2$   $k=1$  to  $1$   
 $q = m_{11} + m_{22} + p_0 p_1 p_2$   
 $= 15125$   
 $i=2$  için  $j=3$   
 $k=2$  to  $2$   
 $q = m_{22} + m_{33} + p_1 p_2 p_3$   
 $= 2625$

$l=3$  için  $i=1$   $j=3$   
 $k=1$  to  $2$   
 $A_1(A_2A_3)$

$m_{13} = \min \left\{ \begin{aligned} &\cancel{m_{11}} + \cancel{m_{23}} + p_0 p_1 p_3 = 7875 \text{ min} \\ &\cancel{m_{12}} + \cancel{m_{33}} + p_0 p_2 p_3 = 7375 \end{aligned} \right.$   
 $(A_1A_2)A_3$

$A_2A_3A_4A_5$

$m_{25} = \min \left\{ \begin{aligned} &\cancel{m_{22}} + \cancel{m_{35}} + p_1 p_2 p_5 = 13000 \\ &\cancel{m_{23}} + \cancel{m_{45}} + p_1 p_3 p_5 = 7125 \rightarrow \text{min} \\ &\cancel{m_{24}} + \cancel{m_{55}} + p_1 p_4 p_5 = 11375 \end{aligned} \right.$

4. Optimal çözümü bulmak

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

$$S_{16} = 3$$

$$S_{13} = 1$$

$$S_{46} = 5$$

Optimal değer =  $m[1,6] = 15125$

Optimal çözüm:  $(A_1(A_2A_3)(A_4A_5)A_6)$