

Exercise 7

Task 1

Find the optimal order to compute the following products (only the dimensions of the matrices are given)

(a) $(2 \times 4) \cdot (4 \times 6) \cdot (6 \times 1) \cdot (1 \times 10) \cdot (10 \times 10)$

(b) $(10 \times 3) \cdot (3 \times 3) \cdot (3 \times 3) \cdot (3 \times 3) \cdot (3 \times 10)$

(c) $(6 \times 5) \cdot (5 \times 4) \cdot (4 \times 3) \cdot (3 \times 2) \cdot (2 \times 1)$

Task 2

Find the optimal search tree for the node set $\{1, \dots, 7\}$ and the following weights

(a) $\gamma(1) = 1, \gamma(2) = 2, \gamma(3) = 3, \gamma(4) = 4, \gamma(5) = 5, \gamma(6) = 6, \gamma(7) = 7$

(b) $\gamma(1) = 3, \gamma(2) = 3, \gamma(3) = 1, \gamma(4) = 7, \gamma(5) = 6, \gamma(6) = 2, \gamma(7) = 5$

(c) $\gamma(1) = 4, \gamma(2) = 0, \gamma(3) = 1, \gamma(4) = 4, \gamma(5) = 5, \gamma(6) = 7, \gamma(7) = 3$