

Matematičke metode u prometu
9. prosinac 2006.

1. Grafičkom metodom riješite linearni problem

$$\begin{aligned} \max(2x_1 + x_2) \\ x_1 + 4x_2 &\leq 12 \\ 4x_1 + 3x_2 &\leq 24 \\ 4x_1 + x_2 &\leq 20 \\ x_1, x_2 &\geq 0 \end{aligned}$$

2. Linearni problem riješite numerički:

$$\begin{aligned} \min(2x_1 - x_2 + 3x_3) \\ 3x_1 + 4x_2 - x_3 &\leq 24 \\ x_1 + 2x_2 + x_3 &= 10 \\ 2x_1 - x_2 - x_3 &\geq 2 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

3. Odredite plan transporta robe s minimalnim troškovima i izračunajte taj trošak

| | O_1 | O_2 | O_3 | O_4 | a_i |
|-------|-------|-------|-------|-------|-------|
| I_1 | 3 | 1 | 4 | 5 | 72 |
| I_2 | 2 | 5 | 3 | 1 | 64 |
| I_3 | 1 | 4 | 2 | 3 | 80 |
| b_j | 45 | 30 | 24 | 36 | |

4. Transportna je mreža matricno zadana. Odredite maksimalni tok i najkraći put kroz mrežu.

$$M = \begin{bmatrix} 0 & 80 & 90 & 90 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 30 & 0 & 30 & 0 & 30 & 0 & 0 \\ 0 & 0 & 0 & 40 & 20 & 50 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 40 & 0 & 20 & 0 \\ 0 & 0 & 0 & 0 & 0 & 30 & 20 & 0 & 60 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 40 & 80 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 80 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 70 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix}.$$