

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.

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

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1. Grafičkom metodom riješite linearni problem

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

2. Linearni problem riješite numerički:

$$\begin{aligned} \max(2x_1 - x_2 + 3x_3) \\ 3x_1 + 4x_2 - x_3 &\geq 6 \\ x_1 + 2x_2 + x_3 &= 12 \\ 2x_1 - x_2 - x_3 &\leq 18 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

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

	$O_1$	$O_2$	$O_3$	$a_i$
$I_1$	3	1	4	32
$I_2$	2	5	3	24
$I_3$	1	4	2	40
$I_4$	5	1	3	42
$b_j$	75	50	64	

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

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