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## Matrična forma problema linearnog programiranja

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Neka je problem linearnog programiranja dat u standardnoj formi:  
Odrediti

$$\max_{(x_1, \dots, x_n) \in \mathcal{S}} (c_1 x_1 + c_2 x_2 + \dots + c_n x_n)$$

gde je  $\mathcal{S}$  skup rešenja sistema linearnih nejednačina

$$\begin{array}{cccccccl} a_{11}x_1 & + & a_{12}x_2 & + & \dots & + & a_{1n}x_n & \leq & b_1 \\ a_{21}x_1 & + & a_{22}x_2 & + & \dots & + & a_{2n}x_n & \leq & b_2 \\ \dots & & \dots & & \dots & & & & \\ a_{m1}x_1 & + & a_{m2}x_2 & + & \dots & + & a_{mn}x_n & \leq & b_m \end{array}$$
$$x_1 \geq 0, x_2 \geq 0, \dots, x_n \geq 0$$

Uvedimo sledeće oznake:

$$A = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & & \dots & \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix} \quad b = \begin{bmatrix} b_1 \\ b_2 \\ \dots \\ b_m \end{bmatrix}$$
$$c^T = [c_1 \ c_2 \ \dots \ c_n] \quad x^T = [x_1 \ x_2 \ \dots \ x_n].$$

Pored toga, pisaćemo

$$[x_1 \ x_2 \ \dots \ x_n] \leq [y_1 \ y_2 \ \dots \ y_n]$$

akko

$$x_1 \leq y_1 \wedge x_2 \leq y_2 \wedge \dots \wedge x_n \leq y_n.$$

Tada se problem svodi na oblik:

Odrediti

$$\max_{x \in \mathcal{S}} c^T x$$

gde je  $\mathcal{S}$  skup rešenja sistema:

$$\begin{array}{l} Ax \leq b \\ x \geq 0 \end{array}$$