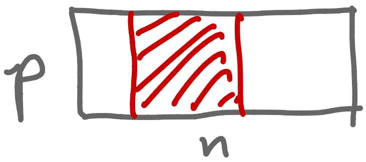
EMO 16.1.16

$$\max \langle c, x \rangle$$

$$Cx = d$$



$\operatorname{rang}(C) = p$

$$x \geq \mathbb{0}_n$$

$B \subseteq [n]$, $|B| = p$, $C_{*,B}$ regulär

↑ Basis (von C)

$N := [n] \setminus B$

$$Cx = d \iff C_{*,B} \cdot x_B + C_{*,N} \cdot x_N = d$$

$$\iff x_B = \underbrace{C_{*,B}^{-1} \cdot d}_{\bar{d}(B)} \underbrace{- C_{*,B}^{-1} \cdot C_{*,N}}_{\bar{C}(B)} \cdot x_N$$

$$\iff x_B = \bar{d}(B) + \bar{C}(B) \cdot x_N$$

Basis-Lösung zu B: $\bar{x} = (\bar{x}_B, \bar{x}_N)$ mit

$$\bar{x}_B = \bar{d}(B)$$

$$\bar{x}_N = \mathbb{0}_N$$

zulässige Basis(-Lösung): $\bar{d}(B) \geq \mathbb{0}_B$

$$\max \langle c_B, x_B \rangle + \langle c_N, x_N \rangle$$

$$\text{s.t.} \quad x_B = \bar{\alpha}(B) + \bar{G}(B) \cdot x_N$$

$$x \geq 0$$

$$\langle c_B, \bar{\alpha}(B) + \bar{G}(B) \cdot x_N \rangle + \langle c_N, x_N \rangle$$

$$= \underbrace{\langle c_B, \bar{\alpha}(B) \rangle}_{\langle c, \bar{x} \rangle} + \langle \underbrace{c_B^T \cdot \bar{G}(B) + c_N}_{\bar{c}(B) = c_N - c_B^T \cdot G_{*,B}^{-1} \cdot G_{*,N}}, x_N \rangle$$

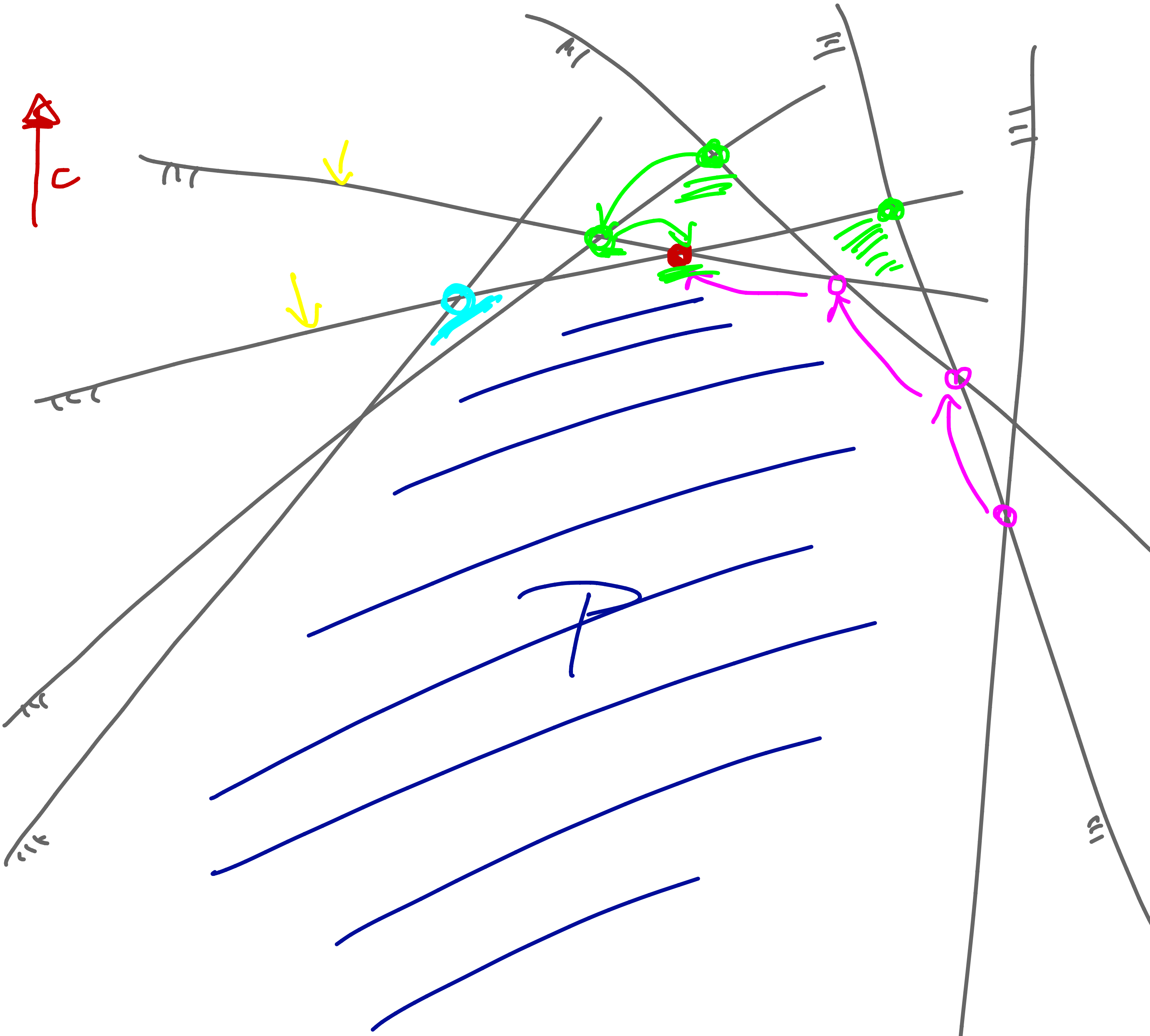
„reduzierte Kosten bzgl. B"

$$= \text{Wert der Basis-Lösung} + \langle \bar{c}(B), x_N \rangle$$

$A = LU$ (L untere, U obere Dreiecksmatrix)

regulär

$$Ax = b \iff L(\underbrace{Ux}_{y}) = b$$



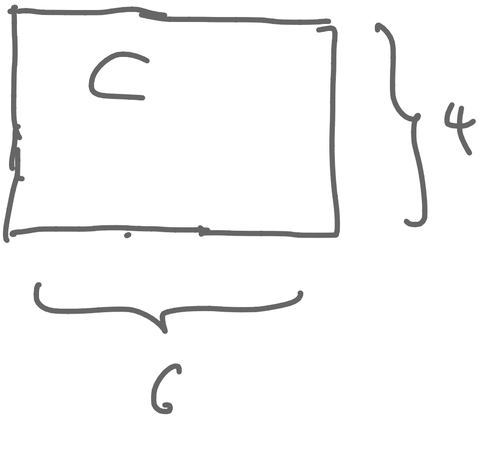


Bild ist in

$$\{x \in \mathbb{R}^6 : Cx = d\}$$

↑ 2-dim.