

Pomocný simplex

$$\begin{aligned}
 s_1 &= 40 - 8x_1 + 5x_3 + x_4 \\
 s_2 &= 24 - 4x_2 + x_3 + x_4 \\
 s_3 &= 8 - x_3 - x_5 \\
 s_4 &= 8 + 2x_3 - x_4 - x_6 \\
 \min s_1 + s_2 + s_3 + s_4 \\
 &\rightarrow \min -8x_1 - 4x_2 + 7x_3 + x_4 - x_5 - x_6 + 80 \\
 &\rightarrow \max 8x_1 + 4x_2 - 7x_3 - x_4 + x_5 + x_6 - 80
 \end{aligned}$$

$$\begin{aligned}
 &\rightarrow x_1, s_1 \rightarrow \\
 x_1 &= 5 + \frac{5}{8}x_3 + \frac{1}{8}x_4 - \frac{1}{8}s_1 \\
 s_2 &= 24 - 4x_2 + x_3 + x_4 \\
 s_3 &= 8 - x_3 - x_5 \\
 s_4 &= 8 + 2x_3 - x_4 - x_6 \\
 \max -s_1 + 4x_2 - 2x_3 + x_5 + x_6 - 40
 \end{aligned}$$

$$\begin{aligned}
 &\rightarrow x_2, s_2 \rightarrow \\
 x_1 &= 5 + \frac{5}{8}x_3 + \frac{1}{8}x_4 - \frac{1}{8}s_1 \\
 x_2 &= 6 - \frac{1}{4}x_3 + \frac{1}{4}x_4 - \frac{1}{4}s_2 \\
 s_3 &= 8 - x_3 - x_5 \\
 s_4 &= 8 + 2x_3 - x_4 - x_6 \\
 \max -s_1 - s_2 - 3x_3 + x_4 + x_5 + x_6 - 16
 \end{aligned}$$

$$\begin{aligned}
 &\rightarrow x_5, s_3 \rightarrow \\
 x_1 &= 5 + \frac{5}{8}x_3 + \frac{1}{8}x_4 - \frac{1}{8}s_1 \\
 x_2 &= 6 - \frac{1}{4}x_3 + \frac{1}{4}x_4 - \frac{1}{4}s_2 \\
 x_5 &= 8 - x_3 - s_3 \\
 s_4 &= 8 + 2x_3 - x_4 - x_6 \\
 \max -s_1 - s_2 - s_3 - 4x_3 + x_4 + x_6 - 8
 \end{aligned}$$

$$\begin{aligned}
 &\rightarrow x_4, s_4 \rightarrow \\
 x_1 &= 6 + \frac{7}{8}x_3 - \frac{1}{8}x_6 - \frac{1}{8}s_1 - \frac{1}{8}s_4 \\
 x_2 &= 8 + \frac{1}{4}x_3 - \frac{1}{4}x_6 - \frac{1}{4}s_2 - \frac{1}{4}s_4 \\
 x_5 &= 8 - x_3 - s_3 \\
 x_4 &= 8 + 2x_3 - x_6 - s_4 \\
 \max -s_1 - s_2 - s_3 - s_4 - 2x_3 + x_4 - 0
 \end{aligned}$$

$$(x_1, x_2, x_4, x_5) = (6, 8, 8, 8)$$

Opravdový simplex

$$x_1 = 6 + \frac{7}{8}x_3 - \frac{1}{8}x_6$$

$$x_2 = 8 + \frac{1}{4}x_3 - \frac{1}{4}x_6$$

$$x_5 = 8 - x_3$$

$$x_4 = 8 + 2x_3 - x_6$$

$$\max 4x_1 + x_3 + x_4$$

$$\rightarrow \max 4\left(6 + \frac{7}{8}x_3 - \frac{1}{8}x_6\right) + x_3 + (8 + 2x_3 - x_6)$$

$$\rightarrow \max \frac{13}{2}x_3 - \frac{3}{2}x_6 + 32$$

$$\rightarrow x_3, x_5 \rightarrow$$

$$x_1 = 13 - \frac{7}{8}x_5 - \frac{1}{8}x_6$$

$$x_2 = 14 - \frac{1}{4}x_5 - \frac{1}{4}x_6$$

$$x_3 = 8 - x_5$$

$$x_4 = 24 - 2x_5 - x_6$$

$$\max 84 - \frac{13}{2}x_5 - \frac{3}{2}x_6$$

$$(x_1, x_2, x_3, x_4, x_5, x_6) = (13, 14, 8, 24, 0, 0),$$

optimalizační funkce nabývá maxima 84