Different LP Problems

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Contents

1 Wikipedia **1**

2 Grötschel **1**

1 Wikipedia

Problem:

$$\text{argmax}_{x\in\mathbb{R}^n}\{c^t x | Ax \leq b, x \geq 0\}$$

Phase I:

$$\text{argmin}_{z\in\mathbb{R}^m}\{\sum_{i=1}^{m} z_i | Ax + z = b, x \geq 0, z \geq 0\}$$

in standard form

$$\text{argmax}_{z\in\mathbb{R}^m}\{sum_{i=1}^{m} - z_i | Ax + z = b, x \geq 0, z \geq 0\}$$

2 Grötschel

Problem:

$$\text{argmax}_{x\in\mathbb{R}^n}\{c^t x | Ax \leq b\}$$

p111-p
Lineares Program in Standardform [p112]:

$$\text{argmax}_{x\in\mathbb{R}^n}\{c^t x | Ax = b, x \geq 0\}$$

mit

1. $m < n$
2. $A \in \mathbb{R}^{m,n}$
3. $\text{rang}(A) = m$
4. $P(A, b) \neq \emptyset$

Phase I:

$$
\begin{aligned}
max \mathbf{1}^t Ax & \\
(A, I) \begin{pmatrix} x \\ z \end{pmatrix} &= b \\
x &\geq 0 \\
z &\geq 0
\end{aligned}
$$