

强对偶定理: 若 (P) 和 (D) 有一个有有限最优解, 则另一个亦有, 且目标函数值相等.

$$\begin{array}{ll}
 \text{(P)} & \text{(D)} \\
 \max C^T x & \min y^T b \\
 \text{s.t. } Ax \leq b & \text{s.t. } A^T y \geq c \\
 x \geq 0 & y \geq 0
 \end{array}$$



不妨设 (P) 有有限最优解  
 $x^* = (x_B, x_N)^T$   
 $(A_B \ A_N)$



$$\begin{array}{l}
 Ax + I \cdot \bar{x} = b \\
 \hline
 \begin{array}{ccc}
 C^T - C_B^T \bar{A}_B^{-1} A & -C_B^T \bar{A}_B^{-1} & -C_B^T \bar{A}_B^{-1} b \\
 \text{1/0} & \bar{A}_B^{-1} A & \bar{A}_B^{-1} & \bar{A}_B^{-1} b
 \end{array} \\
 \hline
 C_B^T \bar{A}_B^{-1} A \geq C^T \\
 C_B^T \bar{A}_B^{-1} \geq 0 \\
 C_B^T \bar{A}_B^{-1} b = C^T x^* \\
 \hline
 y^T = C_B^T \bar{A}_B^{-1}
 \end{array}$$