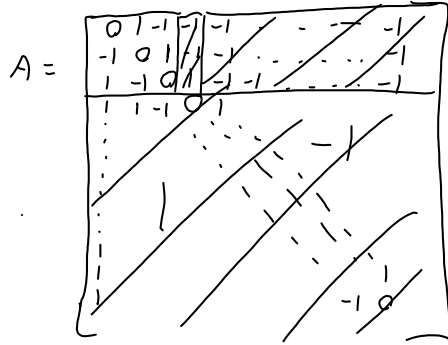


11.2 $A \in \mathbb{R}^{100,100}$



$$x^* = (1/3, 1/3, 1/3, 0, \dots, 0)$$

$$y^* = (1/3, 1/3, 1/3, 0, \dots, 0)$$

11.5

l_n optimal for $R \Rightarrow l_n$ is an opt. sd.

of $\min_y \max_x y^T A x$ (1)

l_n optimal for $C \Rightarrow l_n$ is sd. of

$$\max_x \min_y y^T A x$$
 (2)

(2) = dual (1)

[l_n and l_n optimal] $\Leftrightarrow \max_x l_n^T A x = \min_y y^T A l_n$

$$\Leftrightarrow \max_{j=1, \dots, m} l_n^T A e_j = \min_{i=1, \dots, m} e_i^T A l_n$$

||

$$\Leftrightarrow \max_j a_{nj} = \min_i a_{in} \quad (*)$$

$$(*) \Rightarrow a_{nn} \leq \max_j a_{nj} = \min_i a_{in} \leq a_{nn}$$

$$\Rightarrow a_{nn} = \max_j a_{nj} = \min_i a_{in}$$