

## 12.1 Previous Tutorial

Discuss questions remaining from tutorial 11.

## 12.2 Homework

Discuss problems in Homework 5.

## 12.3 Linear Programming

(*Duality*) A linear programming problem in the standard form can be written in short using the following vector notation:

$$\begin{array}{l} \mathbf{LP1:} \text{ Maximize } (c^T \cdot x), \\ \text{subject to } A \cdot x \leq b \\ x \geq 0 \end{array}$$

Here  $x, c, b$  are vectors and  $A$  is a  $m \times n$  matrix. Consider the following related linear program:

$$\begin{array}{l} \mathbf{LP2:} \text{ Minimize } (b^T \cdot y), \\ \text{subject to } A \cdot x \geq c \\ y \geq 0 \end{array}$$

Here  $y$  is vector of size  $m$ . Consider the following linear program:

Let  $f_1$  be any feasible solution for LP1 and let  $f_2$  be any feasible solution for LP2. Show that  $f_1 \leq f_2$ .