Ex: An electronics company manufactures only white and red LED's (Light Emitting Diodes). The profit earned by producing one LED is as shown below:

PROFIT PER LED VS COLOR

LED Color	Profit
White	\$0.10 per LED
Red	\$0.01 per LED

The objective is to maximize the profit per hour of manufacturing. Thus, the objective function, $J(\vec{x})$, is defined as follows:

$$J(x_1,x_2) = 0.1 \cdot x_1 + 0.2 \cdot x_2 \qquad \text{(Objective function)}$$

where

$x_1 \equiv$ # White LED's / hr

$x_2 \equiv$ # Red LED's / hr

Making an LED requires four manufacturing steps (in this oversimplified example). In each step, there is a maximum capacity per hour for producing LED's of a given color, as listed below.

MANUFACTURING CAPACITY (LED'S PER HOUR) VS COLOR

Manufacturing Step	White LED's	Red LED's
Diffusion Process	100/hr	1200/hr
Photolithography	300/hr	400/hr
Metal Evaporation	150/hr	250/hr
Packaging	100/hr	200/hr

The reciprocal of the capacity equals the amount of time required to produce one LED. Any number of white and red LED's may be made each hour so long as the total time required to make them is less than or equal to one hour. (This means there is no cost associated with switching colors in a manufacturing step, nor is there any requirement that LED's be produced in batches of any particular size.) It follows that the following constraints apply to numbers of LED's produced each hour:

$$\frac{x_1}{100} + \frac{x_2}{1200} \le 1 \qquad \text{(Diffusion process constraint)}$$

$$\frac{x_1}{300} + \frac{x_2}{400} \le 1 \qquad \text{(Photolithography constraint)}$$

$$\frac{x_1}{150} + \frac{x_2}{250} \le 1 \qquad \text{(Metal evaporation constraint)}$$

$$\frac{x_1}{100} + \frac{x_2}{200} \le 1 \qquad \text{(Packaging constraint)}$$