

Campus Liquids. Inc

Variables: $x_1 \hat{=}$ # of bottles of bourbon (in 1000)
 $x_2 \hat{=}$ # of bottles of blended whiskey (in 1000)

Objective:

$$\text{maximize (profit)} \quad 2x_1 + 2.50x_2$$

$$\left[(5-3)x_1 + (4.50-2)x_2 \right]$$

Constraints:

$$3x_1 + 4x_2 \leq 20 \text{ (I)} \quad (\text{machine hours})$$

$$x_1 + 0.2x_2 \leq 4.4 \text{ (II)} \quad (\text{production cost})$$

$$\left[3x_1 + 2x_2 \leq 4.4 + 0.4(5x_1 + 4.5x_2) \right]$$

$$x_1 \geq 0$$

$$x_2 \geq 0$$

sketch:

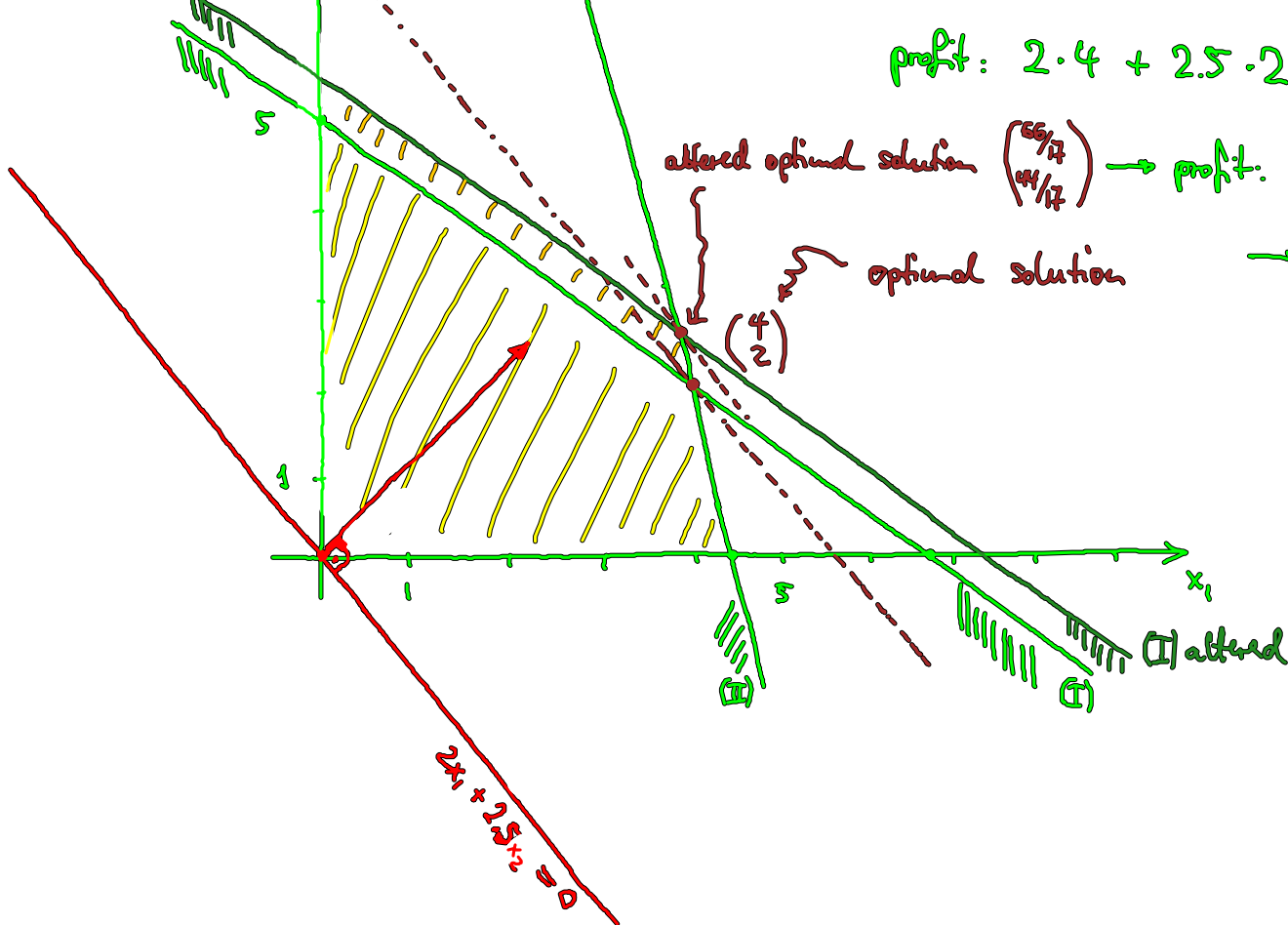
x_2 ↑



profit: $2 \cdot 4 + 2.5 \cdot 2 = 13$

altered optimal solution $\begin{pmatrix} 56/17 \\ 44/17 \end{pmatrix} \rightarrow$ profit: 14.235

optimal solution \rightarrow 1.235



alternative: maximize x_3

subject to

$$\begin{aligned} 2x_1 + 2.5x_2 - x_3 &\geq 13 \\ 3x_1 + 4x_2 &\leq 22 \\ x_1 + 0.2x_2 &\leq 4.4 \\ x_1 &\geq 0 \\ x_2 &\geq 0 \\ x_3 &\geq 0 \end{aligned}$$

Another example: Berlin airlift

1 Cargo unit $\hat{=}$ 1 airplane carry unit $\hat{=}$ 2000 t

TO BE CONTINUED...