# Operations Research, Spring 2016
# Suggested Solution for Pre-lecture Problems for Lecture 7

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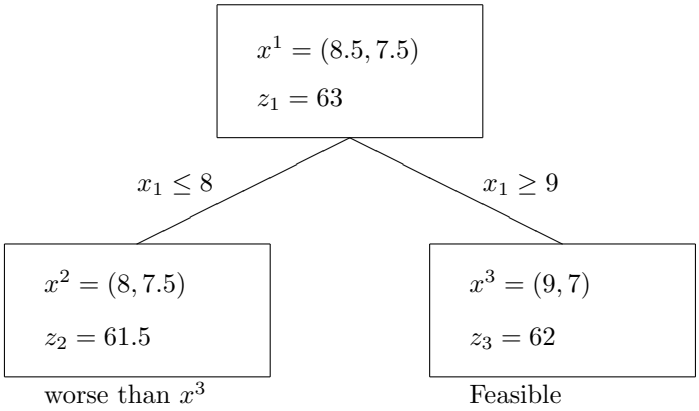
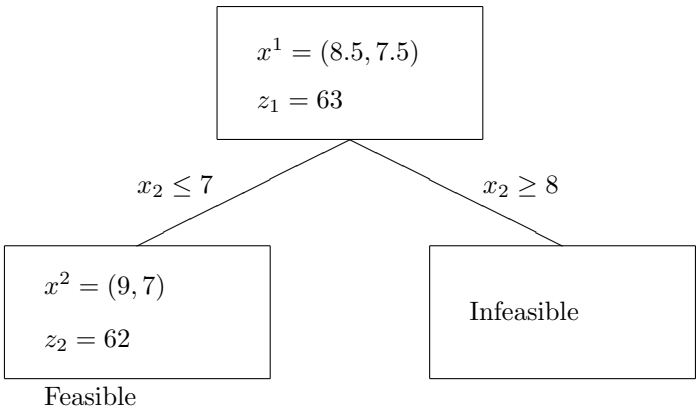
1. (a) The optimal solution of the linear relaxation is $x^1 = (8.5, 7.5)$.

   (b) Let's branch on $x_1$ first.




   (c) Branching on $x_2$




2. (a)

$$M_1 \geq 20 + 10 - 6 = 24$$
$$M_2 \geq 10 + 20 - 8 - 22$$

   (b) The feasible region on the $(x_1, x_2)$ plane is shown in Figure 1. By comparing the two extreme points (0, 6) and (8, 0) in the feasible region, (8, 0) is the better one and therefore the optimal solution.

3. First, we solve the linear relaxation of the given LP. The optimal solution is $x^1 = (0, 4)$ with the objective value 8. Since the optimal solution is IP-feasible, we stop branching.

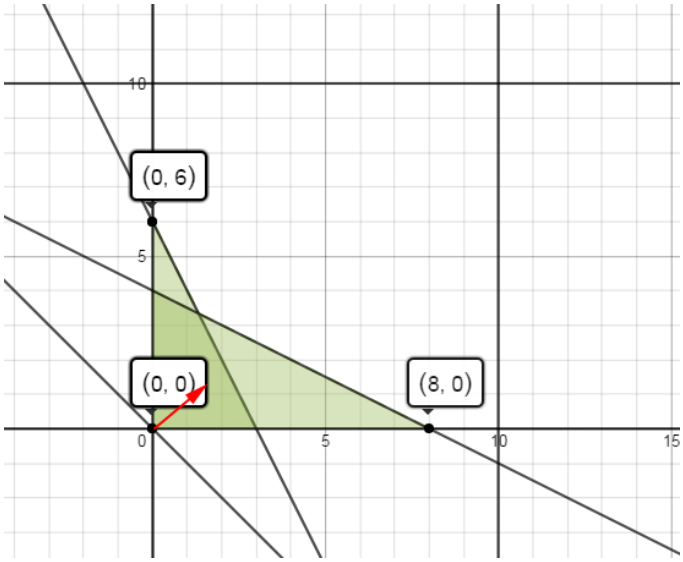



Figure 1: Feasible region for Problem 2.b