Homework 7

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Statement of Integrity: I, Joni Vrapi, attempted to answer each question honestly and to the best of my abilities. I cited any, and all, help that I received in completing this assignment.

Problem 1. decision variables are the variables you need to make a decision on - eg how many bowls/mugs do you need to produce to have the most revenue

Problem 2a. If we let $x = (x_1, x_2, x_3)$ and $y = (y_1, y_2, y_3)$, then the expected loss for Player 1 can be calculated as $\sum x A y^T$ resulting in:

$$x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) \tag{1}$$

Problem 2b. Player 2 playing any strategy other than $(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$ will allow Player 1 to adjust his strategy to play off of Player 2's strategy, resulting in an expected gain for Player 1. For example, assume Player 2 plays $(1, 0, 0)$. Player 1 would then adjust his strategy to play $(0, 1, 0)$ resulting in an expected gain of 1 (from equation 1). Likewise, it is obvious that regardless of what strategy Player 2 chooses, other than $(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$, Player 1 will always be able to play off of it towards an expected gain.

Problem 2c.

Problem 3.

References