

Assignment 2

Due Date: March 12, 2020, in class. Late assignments will not be accepted.

Question 1: Consider the three-player game in Question 2 in Assignment 1. Assume the game is now being played sequentially. Player 1 moves first, player 2 second, and player 3 moves last. Draw a game tree that summarizes this extensive game. Find all the subgame perfect equilibria.

Question 2: Consider the following sequential version of the game between firms A and B described in question 2 in Assignment 1. Specifically, assume that firm A chooses q_M first. Firm B observes q_M and then chooses q_B . Finally, firm A observes q_B (and q_M) and then chooses q_A .

2.1 Derive firm A's strategy in the last stage where it chooses q_A . Describe how this strategy depends on q_B and q_M , and explain the intuition. Do you agree that if q_B and/or q_M is large enough, then $q_A = 0$ is optimal? Explain the intuition.

2.2 Now consider firm B's problem. What is his optimal reaction to $q_M \geq \frac{1}{2}$? Explain your answer. Carefully derive firm B's optimal reaction to any $q_M < \frac{1}{2}$. Finally, summarize firm B's strategy.

2.3 Derive firm A's optimal choice of q_M in the first stage. Summarize the equilibrium. What values do q_M , q_A , and q_B take in equilibrium? Are firms better or worse off in this version of the game than in the simultaneous move version in Assignment 1? Explain your answers and relate it to the "first-mover advantage" discussed in class and in the book.