1.022 Introduction to Network Models **Fall 2018**

Homework 8

Note: This is an OPTIONAL assignment. It can substitute for your lowest grade on homework 1-7, if you submit. The grades will be scaled to match the points of the two homeworks, if necessary.

8.1 Characterizing the Equilibria

1) ***[10 points]*** Find all the pure Nash equilibria of the following game:

	a	b	c
a	2,0	0,1	0, 0
b	0,2	1,0	0, 0
c	0,0	0,0	1, 1

8.2 Price Competition in the Airline Market

Firms selling similar (substitute) products engage in price competition. Consider a scenario where the demand for **A**merican Airlines is a function of the price charged by **B**ritish Airways:

$$Q_A = 100 - p_A + \frac{1}{2}p_B$$

Similarly for British Airways:

$$Q_B = 100 - p_B + \frac{1}{2}p_A$$

Each firm has a cost function $C(q) = 20q$. The utilities are $u_A = p_A Q_A - C(Q_A)$ and $u_B = p_B Q_B - C(Q_B)$.

1. ***[10 points]*** What are the equilibrium prices and quantities in this market?
2. ***[10 points]*** Consider the scenario where firm A decides to purchase firm B. Now firm A can set both p_A and p_B and earns all of the revenue from sales of both products. What prices and quantities will firm A set?
3. ***[5 points]*** Explain the intuition behind the changes in price and quantity you observe for each product. Without doing any math, are consumers better or worse off post-merger?
4. ***[15 points]*** Suppose firm A can buy firm B in exchange of half of its shares. Would firm A go ahead with the purchase? The DOJ asks for our opinion as to whether the merge should be stopped under antitrust law. Based on what we have found in the previous part of this question, what would you recommend?

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