Homework 5

Due November 14, 2017

Industrial Economics
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ICEF - HSE

Homework will be collected at the end of the lecture on the day it is due. Submissions in any other time or manner will be ignored. The maximum score is 100. Unprofessionally looking papers or unnamed or unstapled sheets or improperly labelled questions or bad handwriting will result to a penalty up to 50% at the discretion of the grader. Plagiarism will be prosecuted and perpetrators will have to prove that no integer $k > 2$ satisfies $x^k + y^k = z^k$ in order to graduate.

1. Two firms produce differentiated goods and compete by simultaneously setting prices. The demand for each firm's output is $q_i = a - bp_i + dp_j$, where $i \in \{1,2\}, j \in \{1,2\}$ and $j \neq i$. Assume that costs are zero.
   (a) What is the equilibrium profit of each firm? [20p]
   (b) Show that the firms wish their products to be as homogeneous as possible and explain why this happens. [20p]
   (c) Assume that the two firms colluded. What would be their profit? [20p]
   (d) Imagine that there are N firms instead of two firms with demand for firm i's output being equal to $q_i = a - bp_i + d\bar{p}$, where $\bar{p}$ is the average price set by firms other than i. What are the equilibrium prices? [20p]
   (e) Are consumers better off as the number of firms increases from 2 to N? [20p]

2. You are playing a face-to-face poker game with an opponent who by just observing your reactions has 75% probability of guessing correctly if you have a better or a worse hand than her. As a result, she will fold when she thinks that she has a worse hand than you and will go all-in if she thinks that she has a better hand than you. What would be the best strategy for you to play this opponent? [0p]