Homework 3

due October 8, 2018

1. A monopolistic firm sells its product to two geographically separated markets: North and South. Demand functions for the two markets are $q_N = N - np_N$ and $q_S = S - sp_S$. The monopolist's costs are zero.

   (a) Suppose that the monopolist can use third-degree price discrimination. Calculate the price, output, profit and deadweight loss in each market. [5p]
   (b) If $N = S$ and $n < s$ would the monopolist want to price discriminate? [10p]
   (c) If $N > S$ and $n = s$ would the monopolist want to price discriminate? [10p]
   (d) Explain why the answer is different in (b) and in (c). [5p]
   (e) Suppose now that $N > S$ and $n = s$ but the monopolist cannot price discriminate. Calculate the price and the output sold when the firm serves both regions and when it serves only one region. [10p]
   (f) Compare your results in (c) and (e) and explain what happens to the deadweight loss. [5p]

2. A developer offers new flats in Athens, Greece. The construction cost of each flat is 100,000 Euros. There are two types of prospective customers: type 1 customers are ready to pay up to (250,000 – 10,000X), where X is the number of months that they would have to wait before taking possession of the flat; type 2 customers are willing to pay up to (200,000 – 1,000X). The developer is able to supply all flats immediately and there are 20 customers of type 1 and 20 customers of type 2. Each customer demands at most one flat. The developer cannot distinguish the different types of customers. Moreover, taxes are high enough to prevent any arbitrage between customers.

   (a) Assume that $X = 0$. Find the optimal price for the developer and its profit. [5p]
   (b) Now assume the developer offers 2 options:
      i. the price of the flat is 190,000 and is available in 6 months;
      ii. the price of flat is 240,000 and is available now.
      Which option will be preferred by type 1 customers? Which option will be preferred by type 2 customers? Calculate the developer's profit. [10p]
   (c) Explain why the developer may want to set $X > 0$ in some cases, even though he is able to supply all flats immediately at no extra cost. [5p]

3. A monopolist serves a market with two types of consumers: type 1 and type 2. Each consumer of type 1 has demand for the monopolist's service $q_1 = 50 - p_1$. Each consumer of type 2 has demand $q_2 = 120 - 2p_2$. There are 1000 consumers of type 1 and 1200 customers of type 2. Total cost function for the monopolist is $C = 5000 + 20q$.

   (a) Find the total market demand. [5p]
   (b) Find the profit and profit maximizing price if the monopolist cannot price discriminate. [5p]
   (c) Find the profit and profit maximizing price if the firm can identify the type of each customer and set different prices. [10p]

(d) Compare profits in (b) and (c) and comment whether this is a general result or is it specific to this particular problem. [5p]

4. A mountain resort, which faces a higher demand in the winter, applies peak-load pricing by setting its prices as following: $MR_w = MC_w$ and $MR_s = MC_s$, where w, s stand for winter and summer. Explain why this equilibrium conditions may not accurately portray profit maximization for the resort. [10p]

5. *Woof&Meow* animal hospital has two major client groups: cats and dogs. The executives know that cat owners are usually willing to spend less than dog owners on the health of their pets. Therefore, they are using a system that allows owners to select between two different health plans offered at different prices: the *Basic*, where diagnostic exams are free but therapy is charged extra; the *Premium* where diagnostic exams are still free but therapy is also included. They also have realized that their profits have increased after they started selling these packages. What would you consult them based only on the information above? Explain using the appropriate economic terminology as you were taught in the lecture. [5p]

<div style="border:1px solid; background-color:#eef2d8; padding:10px;">

Good afternoon!

Often big consulting companies hire academics to solve difficult problems for them. Then, they take the solution, have their analysts understand it deeply, break it down in modules and find possible ways it can be marketable in different instances. When they sell it to their final clients they charge several times more than what they paid to the academics who originally solved it. Solving the homework is important. It gives you a feeling of achievement, it allows you to channel your creativity and on top you get some credit. The BIG VALUE, however, comes from the 5 minutes you can spend on the task after you have solved it: from understanding what the meaning of your solution is; why the instructor has asked it; how this solution can be useful to you in other questions. Successful individuals always have in mind the big value, not the small. They don't just solve, they try to understand. Success in business comes from habits that you acquired before you get to the business.

Kosmas

</div>

Estimated completion time: 140 min
Difficulty level (normalized to exam standards): 1.5/5   2. 7/5   3. 6/5   4. 4/5   5. 5/5