Finance 360
Problem Set #5

1) Suppose that the demand curve for video rentals has been estimated to be

$$Q = 2500 - 250P$$

Further, your average costs of supplying videos is equal to

$$AC = 8 - .006Q + .000002Q^2$$

Calculate your optimal price, quantity and profits.

2) Suppose that you are a monopoly faced with a demand curve given by

$$Q = 100 - 2P$$

You have a constant marginal cost equal to $10. Calculate your optimal price and quantity. Show that your price adheres to the optimal markup rule based on demand elasticity.

3) Suppose that the demand for loans depends on the annual interest rate charged (r_l), the annual fees charged (F), and the unemployment rate. Each loan is a $100,000, 30 year fixed APR mortgage. Assume that the unemployment rate is 5% (.05).

$$Q = 125 - 624r_l - .026F - 90.4UR$$

The bank has a monthly fixed cost of $10,000 plus an annual variable cost (interest paid on deposits plus various administrative expenses equal to 5% of the loans created)

a) Suppose that the bank charges nothing in fees. Solve for the profit maximizing interest rate. What are the banks monthly profits?
b) Calculate the interest elasticity of loan demand at the profit maximizing point.
c) Now, suppose that the bank decides to charge $1200 per year in Fees. Calculate the bank's profit maximizing interest rate and monthly profits.
d) How would (c) change if the Fee were a one time (i.e. closing costs)?

4) Suppose the demand for Bananas is given by

$$Q = 50 - 5P$$

The marginal cost of producing bananas is equal to $2.

a) Calculate the price and quantity that would occur if this was a perfectly competitive market.
b) Calculate the price and quantity a monopoly would produce
c) Calculate the difference in consumer surplus between a perfectly competitive outcome and a monopolistic outcome

5) What characteristics are important when determining whether a market will be competitive or monopolistic?