PROBLEM SET 3

1. Adverse selection

In a used car market there are two types of cares: bad (B) and good (G). Assume that the utility from a bad car $u_B = \$100$, an dthe utility from a good car $u_G = \$1000$. Manny, the owner of Manny's Used Cars, buys cars from the general public for his lot (assume he just keeps them on his lot for now). The owner's of the cars who are selling to Manny know the qualities of the cars they are selling, but Manny does not.

a. If car type is observable, what is the price paid for good and bad-type cares?

b. Describe the equilibrium in the market assuming that Manny can only off the same buying price to any car in the market (i.e. cannot discriminate among sellers). What is the equilibrium used car price?

Now assume that a repair shop can perform general inspections of used cars. the costs associated with inspecting a good car $c_G = \$100$, but it costs $c_B = \$600$ for a bad car to pass inspection.

Also assume the Manny offers different purchase prices (p_I and $p_N I$) for cars which have and have not undergone inspection. In the following steps you will derive the prices such that only good cars will undergo inspection.

c. Write down the participation and self-selection contraints for the two types of cars. There should be four constraints total.

d. Solve for for the p_I and $p_N I$ which satisfy all these constraints. (Hint: the participation constraint is binding for good cars, and the self selection constraint is binding for bad cars.) Caompartre these prices to those in part (a).

e. What are the prices if c_B takes on values of $200 or $1000? What happens to prices as c_B increases?

2. Moral Hazard

Consider the fire insurance model described in class.

Make the following assumptions.

- Individual's utility functions for money are $U(x) = lnx$ where x is dollars.

- Starting income (M) =$10,000; $K_2 = \$5,000$; $C = \$500$

- $p = 0.20; p^* = 0.75$ (so taking preventive precautions decreases the probability of fire from 0.75 to 0.25)

- Premium is fair (i.e., $K_1 = pK_2$);deductible $D = \$1000$

a. Will an individual with insruance take the preventive precautions?

b. Does you answer change if D is lowered to $500? Solve for the deductible value which makes the insured individual indifferent between taking and not taking the preventive precautions.

c. Does you answer change if p rises to 0,40? Solve for the value of p which makes the insured individual indifferent between taking and not taking the preventive precautions.

d. Based on your answers to (b) and (c), say something about how the incentive to take preventive measures is related to D and p.

3. Information

Evaluate the following statement: For goods of uncertain quality, so long as either the seller or buyer can determine the quality prior to the sale, there will be efficient consumption.

4. Information

Adverse Selection
1. Describe the asymmetric information problem in the labor market 2. Who has asymmetric information?

5. Double Marginalization

The market demand curve for hot dogs is $Q = 20 - 3p$. Hot dogs are produced by Boca Raton, Inc. at a constant marginal cost of 1. The two fast-food stores Dogs-r-Us1 and Dogs-r-Us2 are the sole distributors of Boca Raton hot dogs in Baltimore. The face a marginal cost of 1 in addition to the cost of each hot dog which they buy from Boca Raton.
(a) Assume the Boca Raton veritcally integrates with both fast-food stores. What is price and output under this scenario? What are profits? What is consumer surplus?
(b) Assume that Boca Raton, Dogs-r-Us1, and Dogs-r-Us2 operate independently. Assume that they compete in a Cournot fasion. What is the output and the retail and wholesale prices in this non-integrated scenario? How much profit does each firm make? What is consumer surplus?
(c) Consider the same scenario as above except that the two retailers not compete in a Bertrand fashion rather than Cournot. What is the output and the retail and wholesale prices in this non-integrated scenario? How much profit does each firm make? What is consumer surplus?

(d) Suppose Boca Raton can charge a franchise fee to the fast-food retailers. What is the profit maximizing fee, assuming that the franchises compete in Cournot fashion?

6. 2nd degree price discrimination

Your software company has just completed a new version of its program, a voice activated word processor. The program is valued by market segments of equal size namely professionals and students. Professionals would be willing to pay up to $400 for the program while students would pay $100 for the full version. A scaled down version of the program is worth $50 to students, but is worthless for professionals. The software has already been developed and marginal production costs are zero. What are the optimal prices for each version of software?