

Question 1) (30 points)

Fire Wings (F) and WingStop (W), the two places offering chicken-wings in Davis sell differentiated end-products, due to the different mix of spices they use. Further, Wingstop gets a higher demand as it is located closer to the Davis downtown.

i) Quantity competition: Suppose they face inverse demands of $p_F = 120 - q_F - 0.5q_W$ and $p_W = 140 - q_W - 0.5q_F$ respectively, where q_F and q_W are the number of buckets of wings produced by them everyday. Each firm has a marginal cost of x (and zero fixed cost), where x is the last digit of your UCD student identity number (make sure you write down your student id at the beginning of the question and also make sure that you are using your student identity number: we would deduct points if you don't do one of these two things). For example, if your student id is 123456789, then x should be 9. Solve for the Nash-Cournot equilibrium quantities.

ii) Price Competition: For the same marginal cost as before, suppose Firm 1 faces a demand function of $q_F = 120 - 2p_F + p_W$, and Firm 2 faces $q_W = 140 - 2p_W + p_F$. Solve for the Bertrand equilibrium.

Question 2) (20 points)

Consider the following competitive market. Suppose the inverse market demand for an industrial insecticide is $p = 180 - Q$. The private marginal cost is $MC_p = 10 + Q$. Pollution generated during the production process creates an external marginal cost to society equal to $MC = 2Q$. What is the socially optimal quantity of insecticide? What specific tax would result in a competitive market producing the socially optimal quantity of insecticide?

Question 3.i) (10 points) What is the difference between Moral Hazard and Adverse selection? Give an independent example of each (your example should not be from the lecture notes).

3.ii) (20 points) For this question, you would be proving an easy version of one of the most interesting results from the economic theory of voting: The median voter theorem. This says that with two large parties of roughly equal size, political competition will pull both parties towards centrist policy stances. Parties of both left and right can be assured of the votes of radicals who have nowhere else to go. It is the wavering 'swing voters' who determine the contest, and their movement back and forth between the two big parties is thought to yield a healthy periodic change from one government to another, and to ensure that the party of opposition sees winning over the swinging voter as its path to power.

Okay, now to the problem. Suppose, there are 2 candidates, who are choosing positions on a political spectrum, which has 5 positions: 1, 2, 3, 4, 5. (For example, lower numbers could be leftist positions, 1 being the left-most political position, and 5 being the right-most political position)

At each position, there are 20% of the voter population, who find it to be their favourite political position (henceforth called the *bliss point* of those voters). When choosing between any two political positions, voters vote for the candidate who holds a position nearest to theirs. The voters who find both candidates to be equidistant from their position, vote for either candidate with 50% probability.

Consider the game between the two candidates. Both of them have 5 potential actions, where each action is to compete in the vote using one of the 5 possible political positions. For simplicity, assume that for any profile of actions taken by the two players, each player's payoff is the expected share (%) of vote she gets. (Note how it means that the candidates don't care about the political position, anymore than it helps them get more votes!)

Fill out their matrix of payoffs. For exposition, I have filled out the first row of payoffs.

		Candidate 2				
		1	2	3	4	5
Candidate 1	1	50,50	20,80	30,70	40,60	50,50
	2					
	3					
	4					
	5					

Are there any strictly dominant strategies for Candidates 1 and 2? Show that playing 1 or playing 5 are strictly dominated actions for both the players.

If Candidate 1 knows that Candidate 2 is rational, and hence Candidate 2 would not play 1 or 5 (strictly dominated actions), what should Candidate 1 play and why? What is the pure strategy Nash Equilibrium of the game?

The median voter(s) is (are) the one whose bliss point is the median political platform. Do you see why this result is called the median voter theorem?

Question 4) (20 points)

Here is a really interesting podcast about the deadweight loss of Christmas gift giving. Do you know which novel the Scrooge reference is from? (look up "Ebenezer Scrooge" on google if you don't)

How is Joel measuring deadweight loss of christmas? Argue how there could be zero or negative consumer surplus for the gift receiver. How could the "joy of giving" overcome this deficit in consumer surplus, and what is Joel's claim of why even that cannot rescue bad giving?

Do you think cash giving could be a solution to this? What is the solution that Joel suggests? Why does he claim that holiday gift giving is a necessity and not a luxury good? What are the missing satisfaction numbers he calculates for USA and the rest of the world?