



commerce
undergraduate
society

COMM 295 FINAL REVIEW SESSION

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REPEATED GAMES

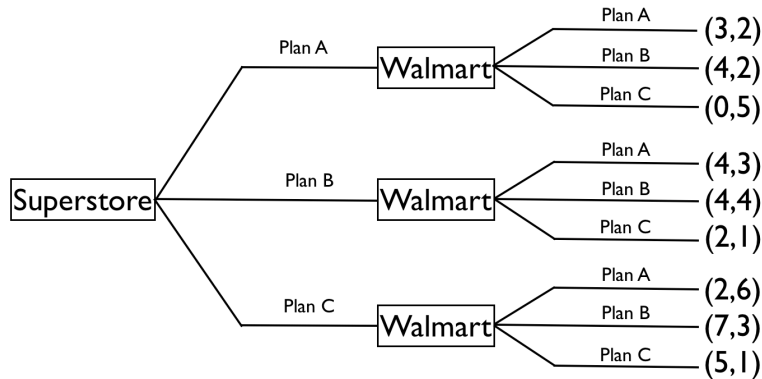
1. Consider a game with the following payoff table:

		Player 2	
		Cheat	Cooperate
Player 1	Cheat	5, -20	-20, 5
	Cooperate	50, 50	20, 20

- a. What is the Nash equilibrium(a) if the game is only played once? Why?
- b. What is the Nash equilibrium(a) if the game is played indefinitely with a tit-for-tat strategy in place? Why?
- c. What is the Nash equilibrium(a) if the game lasts two periods? Three periods? Why?



2. Superstore and Walmart are the two largest supermarket companies in a local city. Suppose Superstore is the first mover to pick a product pricing plan, so which plan Walmart picks is contingent upon Superstore's move. Which plans will Superstore and Walmart end up picking?



3. Suppose that Superstore and Walmart pick their product pricing plans simultaneously every month. Superstore has the option to pay \$1.5 million (equivalent to 1.5 on the payoff table) for the right to move first.

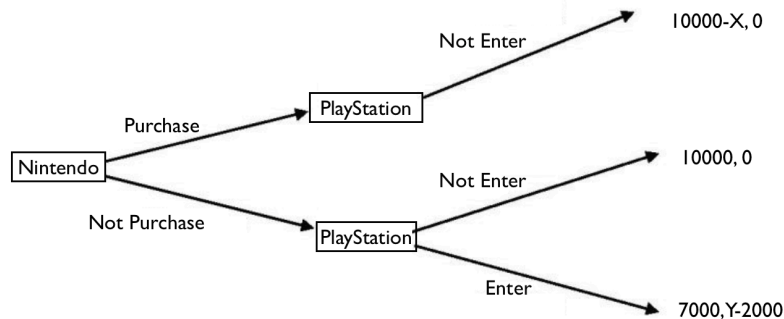
		Walmart		
		Plan A	Plan B	Plan C
Superstore	Plan A	3 6	2 5	0 4
	Plan B	2 0	4 4	2 3
	Plan C	1 4	0 3	5 5

a. What is Nash equilibrium(a)?

b. What is the Stackelberg equilibrium if Superstore moves first assuming that it does not cost Superstore anything to be the first mover?

c. Should Superstore pay for the first mover right?

4. Nintendo has long been a success in releasing series of Pokémon video games. PlayStation considers introducing a series of Pokémon video games as well. Such move will dilute Nintendo's market share. However, Nintendo has the option of purchasing the Pokémon Company and monopolizing the Pokémon franchise to prevent competitors from making Pokémon video games.



- a. Assume that X stands for is the amount that Nintendo can pay for to keep PlayStation from entering the market. At what cost will Nintendo purchase Pokémon Company to keep PlayStation out of the competition?
- b. Assume that Y stands for the upfront cost that PlayStation needs to pay to enter the market. At what upfront cost will PlayStation enter the market of Pokémon video game?

- c. Suppose competitors do not have complete information of Nintendo's profits, will Nintendo pay a cost of \$4000 to monopolize the Pokémon franchise? What if there will be more than just PlayStation considering entering the Pokémon video game market?

BEHAVIORAL DECISION-MAKING UNDER UNCERTAINTY

Kelvin studies Finance in a business school and believes he can make wise investment decisions. He has some savings and would like to spend all the money on investment. He is faced with three investment options:

- 1) 50% chance of earning \$200 in return and 50% chance of earning only \$20 in return
- 2) 35% chance of earning \$250 in return and 65% chance of earning only \$10 in return
- 3) Lend the money to a family friend who promised to pay back \$100 in addition to the initial amount borrowed

1. Which option has the highest risk?

2. Which investment option will Kelvin pick if Kelvin is...

a. Risk neutral with utility function $U(x)=x$?



b. Risk averse with utility function $U(x)=x^{1/2}$?

c. Risk-preferring with utility function $U(x)=x^2$?

3. Debbie is completing a gambling task for a Psychology experiment. She is given two options: she could either walk out of the room with \$50, or enter a draw to have a 40% chance of winning \$100 and a 60% chance of receiving only \$20. Debbie's utility is defined by the utility function $U(x)=x^{0.25}$, where x is the amount of money she receives from the experiment.

a. What is Debbie's expected utility from getting the \$50?



- b. What is Debbie's expected utility from entering the draw?
- c. According to the expected utility hypothesis, which option will Debbie pick?
- d. What is the % chance of winning \$100 in the draw that would induce Debbie to be indifferent between walking away with the \$50 and entering the draw?



ADVERSE SELECTION

In a market of used gaming consoles, both good used gaming consoles and inferior used gaming consoles are available. Owners of those gaming consoles have information of the actual qualities of the gaming consoles, whereas the buyers do not. In the market, 50% of all used 3DS are good, and 50% are inferior. All buyers are risk neutral and are willing to pay \$130 for a good used 3DS, but only \$80 for an inferior used 3DS. The owners of the good used 3DS are willing to sell them at a price no lower than \$120. The owners of the inferior used 3DS are willing to sell them at a price no lower than \$60.

1. What is the equilibrium price? Is there adverse selection?

2. For what relative fractions of good used 3DS and inferior used 3DS will adverse selection not occur?



MORAL HAZARD AND AGENCY

Peter operates a stand that sells kites in the park. During good days, more profits get generated. During bad days, business declines and profits decline. There is an equal chance for a good day as for a bad day. Peter hires and pays Susan to sell kites for him. Susan can decide what level of effort she puts into working—the higher the effort, the more profits get generated. But Susan incurs a cost of \$48 for putting in high effort. The table below summarizes the profits that the kite business expects to make under different situations. Determine whether Susan prefer to input normal or high effort in each situation, and what Peter would get.

	Bad Day	Good Day
Normal Effort	80	240
High Effort	240	400

1. Peter pays Susan a fixed wage of \$60 regardless of efforts.
2. Peter could monitor Susan's performance and pay Susan a bonus of \$40 for normal effort and \$120 for high effort.
3. Peter offers Susan a 30% profit share



4. What is the minimum profit share that Susan is willing to input high effort?

5. Which paying contract maximizes total surplus?



MARKET FAILURE

1. Evaluate the following statements and identify whether each statement represents a Pareto improvement or Pareto efficiency.
 - a. A cellular company priced a cellular plan at \$50, but it decides to lower its price to \$40, which is a price that would maximize total surplus.
 - b. Peter has a burrito, but he prefers burger. Sally has a burger but prefers burrito. Peter and Sally decide to trade.
 - c. Molly, Melody and Milo are having a girls' night out. Molly and Milo want to go to the pub, and do not want to go anywhere else. Melody does not like the pub. But Melody does not want to disappoint her friends, she decides to go to the pub with them.

2. A plant producing gel for highlighter is in a perfectly competitive market. The gel is toxic and the production process involves pollution. The private marginal cost is given by $MC=2Q$ and the external marginal cost is given by $MC=0.25Q$. If the market demand for this gel is $Q=60-P$, how much tax per unit of production should the government impose on the plant to induce efficiency?



3. A chemical plant that sells a harmful chemical has a cost function of $C=30x+7$ and is required to sell the chemical at a price equivalent to its marginal cost per kg. The inverse market demand is represented by $P=130-Q$. The production of the chemical pollutes the nearby lake and affects those living around the plant. The negative effect incurs a social cost of \$10 per kg of the chemical produced. Calculate the deadweight loss induced by the externality.