

**Problem 1:** State whether each statement is true or false and explain why:

- (a) Monopolistic competition is a market structure with the following characteristics: 1) many competing producers; 2) products are differentiated on the basis of price, quality, marketing, and other attributes; 3) free entry and exit; 4) compete on price, quality, and marketing  
**True. Those were all monopolistic competition's characteristics.**
- (b) Monopolistic competitive markets may have positive profit and produce at the efficient quantity of output in the long run.  
**False, monopolistic competition market has zero profit in long run. If monopolistic competitive firm have positive profit in long run, new firm will enter the market. The demand curve for each monopolistic competitive firm will shift in. The demand curve will be stable once there is no new firm enters, meanwhile 0-profit for monopolistic competitive firm in the long run. Each firm here chose quantity at its profit maximizing point as monopoly, which is not the efficient quantity.**
- (c) In monopolistically competitive industries, the demand curve facing a given firm may shift in and become more elastic as more firms enter the market.  
**True. In monopolistic competitive industries, as more firm enter, consumers have more choice at each price. If a monopolistic competitive company changes its price higher, it is more possible to loss consumers. The demand curve facing a given firm becomes more flat. The demand elasticity for perfect competitive, monopolistic competitive, oligopoly and monopoly are decreasing. As more firms enter the monopolistic competitive market, the market is more approximate perfect competitive market, which has higher elastic demand.**
- (d) There is no welfare loss in the monopolistically competitive market because free entry.  
**False, there is welfare loss in monopolistic competition because each firm still changes a price above marginal cost and produced less than the socially optimal level of output.**

**Problem 2:** From the matrix below:

- (a) Find the Nash equilibrium of the game below.  
**The NE of the game is (up, center).**
- (b) Does either player have a dominant strategy? If so, what?  
**UP is a dominant strategy for Player 1 and Center is a dominant strategy for Player 2**

		Player2		
		Left	Center	Right
Player1	Up	6,1	45,10	5,0
	Middle	3,5	35,15	0,8
	Down	0,8	10,10	3,7

**Problem 3:** Ford and Lexus are competing in the market for SUV’s. We assume there are no other rivals in the SUV market. The companies are planning to introduce a new model in this fall. They should decide whether to invest lots of money in advertisements or not. The profits of the two firms depend on the joint choice of both firms. The payoff matrix for the firms’ interaction of strategies is shown below.

		Lexus	
		Aggressive Advertisement	Normal Advertisement
Ford	Aggressive Advertisement	(7, 7)	(12,5)
	Normal Advertisement	(5,12)	(10,10)

- a) Compute Nash Equilibrium of this game. Dose either firm have a dominant strategy?  
 The NE is for both firms to advertise aggressively. Advertise aggressively is a dominant strategy for both firms
- b) What would happen if the firms agreed ahead of time to advertise normally? Would either firm violate the agreement?  
 Both firms would violate such an agreement.
- c) Under what conditions might the firms be able to cooperate and have normal advertisement? Explain.  
 If they firms were going to intact in a market for an infinite or indefinite number of periods they might be able to ensure cooperation (Normal Advertisement) by adopting tit-for-tat or trigger strategies. If they firms adopted these strategies they would be weighing the present gains from Aggressive Advertisement against the loss of future profits due to use of tit-for-tat or trigger strategies. If they care enough about the future they might be able to cooperate and have normal advertisement.

**Problem 4:** Lars and Hans are the only sellers of cross-country skis in the small town of Nordicville. They both agree that they will earn higher profits if they both sell at a higher price. However, each knows that if the other person charges a high price, then they can steal his business by charging a low price. Thus their payoff (profit) matrix from either charging a high price (H) or a low price (L) is as follows:

		<b>Lars</b>	
		H	L
<b>Hans</b>	H	(10, 10)	(-1, 12)
	L	(12, -1)	(0, 0)

- (a) Suppose the two sellers are both planning to retire after this season. What outcome do you expect from this game?

They will both choose a low price and earn zero profits.

- (b) Suppose the two sellers are planning to stay in business indefinitely. Each seller makes the following pledge: “I will set a high price until the other guy sets a low price. After that, I will only charge a low price, because I know the other guy can’t be trusted.” Will each seller keep his pledge?

Each seller will keep the pledge if they care enough about the future, and they will choose H forever.

Let’s focus on Hans’s payoff in each period and given Lars follows the pledge forever. The second row is Hans’ payoff if he plays H forever and the third row is Hans’ payoff if he deviates from H to L in certain period (say the 2<sup>nd</sup> period). The fourth row is the difference between the deviation and no deviation.

	1 <sup>st</sup> period	2 <sup>nd</sup> period	3 <sup>rd</sup> period	4 <sup>th</sup> period	5 <sup>th</sup> period	future
If Hans dose not deviate	10	10	10	10	10	10 forever
If Hans deviate to L at 2 <sup>nd</sup> period	10	12	0	0	0	0 forever
changes	0	+2	-10	-10	-10	-10 forever

If Hans deviate from H to L once, he can get +2 more profit in one period, but after that he will earn 10 less in each subsequent period. So Hans will weigh the present gains from L against the loss of future profits due to use this pledge. If he cares about future (i.e., his discount rate is super high), he will choose H forever.