Homework Exercises 8: Monopolistic Competition and Oligopoly

Question 1

The owner of an optometry practice in a city with over 100 other optometrists has the following data for eye exams:

Price per Eye Exam ($)	Eye Exams per Week	Total Cost per Week ($)	Total Revenue per Week ($)	Marginal Revenue	Marginal Cost
100	100	10,500			
80	140	10,800			
60	200	11,300			
40	310	12,290			
20	550	14,762			

a. Fill in the columns for total revenue, marginal revenue, and marginal cost.
b. Why might this optometry practice face a downward-sloping demand curve, even with many competitors in the city? (Hint: Think about what makes monopolistic competition different from perfect competition.)
c. Using your completed table, what price and number of eye exams per week should the practice choose to maximize profit? Show your reasoning.

Question 2

Suppose the government places a lump-sum (a fixed amount) tax on each firm in a monopolistically competitive market. In the short run, how will this tax affect the price, output, and profit of a typical firm? What will happen in the long run?

Question 3

Traditional street food like curried fish balls, *siu mai (a type of dumpling)*, milk tea and pineapple buns are part of Hong Kong's daily fare and are popular with people of all ages. Hong Kong's street-food market is made up of many small vendors and is considered monopolistically competitive. Recently, the international convenience chain 7-Eleven started selling popular local street foods in its stores[1]. How might this affect a typical small street-food vendor?

Question 4

In the small town of Ptomaine Flats, there are two restaurants: Road Kil Café and Sal Monella's Italian. Each must decide whether to clean up their restaurant or continue ignoring health code violations.

Each restaurant currently makes $7,000 a year in profit. If they both clean up, they will attract more customers but must bear the higher cost; so they will both earns a profit of $5,000. However, if one cleans up and the other doesn't, the cleaner restaurant earns will attract huge amount of customers. The cleaner restaurant ends up with $12,000, and the dirty one incurs a loss of $3,000.

a. Draw the payoff matrix for this situation. Clearly label the strategies and payoffs for each restaurant.
b. What is the dominant strategy for each restaurant? Explain
c. What is the likely outcome if both act in their own self-interest? Explain.
d. If the two restaurants believe they will face the same decision repeatedly, how might the outcome change? Why?

[1] Source: 7-Eleven café fires first shot in fish ball war, *SCMP*, Sept 7, 2009.

e. Now suppose that if one cleans up and one stays dirty, the cleaner restaurant only makes $6,000 in profit (all other payoffs stay the same). What will happen if they do not cooperate? What if they do cooperate?

Question 5

The international express-package industry is dominated by four firms: FedEx, UPS (both American), and DHL, TNT Express (both European). UPS has announced plans to merge with TNT. The European Commission is concerned this could lead to *tactic collusion on price setting* in the industry. Therefore, they are investigating these sorts of concerns in deciding whether to approve the merger[2].

a. Suppose these four firms form a cartel. Draw a diagram showing how they would decide the profit-maximizing price and output for the whole industry, and how they might split output among themselves.
b. What problems might the cartel face in staying together? How could the merger of UPS and TNT affect the cartel's stability? Explain briefly.

Question 6

Pat's and Geno's are two rival cheesesteak restaurants in Philadelphia, that are located across the street from each other. Since they serve almost the same food, they are fiercely competitive. With the weather in Philadelphia improving, sales at both firms are expected to increase over the next few months. Suppose both firms are now considering expanding their menu to include cheesecake and other desserts to boost sales further. The payoffs are given in the following table:

		Pat's	
		Introduce Desserts	Don't Introduce Desserts
Geno's	Introduce Desserts	Pat's profits will increase by $60,000 Geno's profits will increase by $60,000	Pat's profits will increase by $10,000 Geno's profits will increase by $80,000
	Don't Introduce Desserts	Pat's profits will increase by $80,000 Geno's profits will increase by $10,000	Pat's profits will increase by $20,000 Geno's profits will increase by $20,000

a. Suppose Geno's and Pat's make their decisions simultaneously. What is the Nash equilibrium in this game.
b. Now suppose that Pat's will decide whether or not to introduce desserts first, and then Geno's will decide. Draw the game tree for this sequential game.
c. Determine how this sequential game will play out.

Question 7

Airbus and Boeing are competing to develop a new jet. Boeing is ahead in the development process, and Airbus must decide if it wants to join the competition.

[2] Source: And then there were three?, *The Economist*, 1 September, 2012.

- If Airbus stays out, it earns zero profit. Boeing gets $1 billion profit (monopoly).
- If Airbus enters, Boeing must choose how to respond:
    - If Boeing competes peacefully, both companies earn $300 million each.
    - If Boeing starts a price war, both companies lose $100 million

a. Draw this strategic situation as a game tree.
b. What is the predicted outcome of this game? Explain clearly.