

# 1 Chapter 14 - Suggested Problems

## 1.1 Other practice problems:

#1) Intel and AMD are chip makers in the computer industry. Both firms offer similar products, and compete on prices. Assume that they make their pricing decision simultaneously.

Given the following payoff matrix:

		AMD	
		Low Price	High Price
Intel	Low Price	(6,2)	(7,0)
	High Price	(5,4)	(10,3)

payoff: (Intel, AMD)

a) Assume the game is only played once. Do the players have dominant strategies? Is there a dominant strategy equilibrium? Explain

b) Assume the game is only played once. What is the Nash equilibrium(s), if any, for this game?

c) Why is (high price, high price) NOT a Nash equilibrium set of strategies in the one shot simultaneous move game.

**Answer**

If Intel chooses a low price  $\Rightarrow$  AMD should choose a low price

If Intel chooses a high price  $\Rightarrow$  AMD should choose a low price

If AMD chooses a low price  $\Rightarrow$  Intel should choose a low price

If AMD chooses a high price  $\Rightarrow$  Intel should choose a high price

a) AMD has a dominant strategy - low price. Intel does not have a dominant strategy. As such, there is no dominant strategy equilibrium.

b) There is only one Nash equilibrium. The Nash equilibrium set of strategies is: (low price, low price)

c) Because AMD would have the incentive to choose a low price if Intel were to choose a high price. Said differently, it would not be a best response from AMD's point of view.

#2) Intel and GM are two firms that compete on prices. Assume that they make their pricing decision simultaneously.

Given the following payoff matrix:

		GM	
		Low Price	High Price
Intel	Low Price	(7,4)	(7,6)
	High Price	(10,4)	(10,6)

payoff: (Intel, GM)

- a) Is there competitive interdependence in this game?
- b) Assume the game is only played once. Do the players have dominant strategies? and is there a Dominant Strategy equilibrium? Explain
- c) Assume the game is only played once. What is the Nash equilibrium(s) set of Strategies, if any, for this game?
- d) Assume the game is played with no end in sight. Can the outcome of (10, 6) in every period be supported with strategies that do not involve a threat of retaliation?

**Answer**

- a) There is no interdependence because the decision made by Intel do not affect the profitability of GM, and vice versa.

If Intel chooses a low price  $\Rightarrow$  GM chooses a high price  
 If Intel chooses a high price  $\Rightarrow$  GM should choose a high price

If GM chooses a low price  $\Rightarrow$  Intel should choose a high price  
 If GM chooses a high price  $\Rightarrow$  Intel should should a high price

- b) Both GM and Intel have a dominant strategy - high price (see above). As such there is a dominant strategy equilibrium.
- c) There is only one Nash equilibrium. The Nash equilibrium set of strategies is: (high price, high price)
- d) Because of the lack of interdependence, the players do not need to worry about the actions of the other players. Both players want to choose a high price. There is no need for a threat (note: you cannot threaten anyway because you cannot affect the other's profits)