

## ECN 453: Extra Game Theory Questions

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## The discrete Bertrand game (p186)

- **Question:** Two firms set prices simultaneously. Consumers buy from the firm with the lowest price and split their demand equally across the two firms if prices are equal. Market demand is  $q = 10 - p$ ,  $MC = 2$ . Sellers can only set the following prices: 3, 4, 5.
- 1. Write down the normal form game.
- 2. Solve for the equilibrium of the game.

## Ex. 7.7 HDTV Standards

- **Question:** US and Japan simultaneously decide whether to invest a high or low value into HDTV research. If both countries choose 'low' payoffs are (4,3) for the US and Japan respectively. If US chooses low level and Japan a high level, payoffs are (2,4). If US chooses high level and Japan low, payoffs are (3,2). If both countries chooses a high level, payoffs are (1,1).
- 1. Are there any dominant strategies in this game? What is the Nash equilibrium? What are the implicit rationality assumptions?
- 2. Suppose the US now has the option of committing to a strategy ahead of Japan. How would you model this situation? What are the subgame-perfect Nash equilibria of this game?
- 3. Comparing your answers to 1. and 2., what can you say about the value of commitment for the US?

## Price match guarantee in the market for luxury cars

- Two firms are competing on prices. Each firm can choose to set a high price  $p_H$  or a low price  $p_L$ , where  $p_H > p_L$ . Profits are given by:

		Firm 2	
		$p_H$	$p_L$
Firm 1	$p_H$	100	120
	$p_L$	100	0
	$p_H$	0	70
	$p_L$	120	70

- 1. Draw the extensive form if firm 1 moves first. Solve for the subgame perfect equilibrium.
- 2. Suppose firm 1 offers consumers to match its price with the lowest price in the market. Solve for the SPE of the modified game (Hint: modify the game to three stages, allowing firm 1 to make a move in the third stage only in the case where it chose  $p_H$  in the first stage and firm 2 chose  $p_L$  in the second stage.)