

ECO101A: Introduction to Economics

Tutorial 6

1. Demand for light bulbs can be characterized by $Q = 100 - P$, where Q is in millions of lights sold, and P is the price per box. There are two producers of lights: *Everglow* and *Dimlit*. They have identical cost functions:

$$C_i = 10Q_i + \frac{1}{2}Q_i^2, (i = E, D); Q = Q_E + Q_D$$

- Unable to recognize the potential for collusion, the two firms act as short-run perfect competitors. What are the equilibrium values of Q_E , Q_D , and P ? What are each firm's profits?
 - Top management in both firms is replaced. Each new manager independently recognizes the oligopolistic nature of the light bulb industry and plays Cournot. What are the equilibrium values of Q_E , Q_D , and P ? What are each firm's profits?
 - Suppose the Everglow manager guesses correctly that Dimlit has a Cournot conjectural variation, so Everglow plays Stackelberg. What are the equilibrium values of Q_E , Q_D , and P ? What are each firm's profits?
 - If the managers of the two companies collude, what are the equilibrium values of Q_E , Q_D , and P ? What are each firm's profits?
2. Two competing firms are each planning to introduce a new product. Each will decide whether to produce Product A, Product B, or Product C. They will make their choices at the same time. The resulting payoffs are shown below.

We are given the following payoff matrix, which describes a product introduction game:

		<i>Firm 2</i>		
		<i>A</i>	<i>B</i>	<i>C</i>
<i>Firm 1</i>	<i>A</i>	-10,-10	0,10	10,20
	<i>B</i>	10,0	-20,-20	-5,15
	<i>C</i>	20,10	15,-5	-30,-30

- Are there any Nash equilibria in pure strategies? If so, what are they?
- If both firms use maximin strategies, what outcome will result?
- If Firm 1 uses a maximin strategy and Firm 2 knows, what will Firm 2 do?