

EC3312: Game Theory & Applications to Economics

Tutorial 2

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1 Cournot model with n players

Suppose there are n firms who each choose quantity $q_i \geq 0$. The firms face constant marginal cost $c \geq 0$ and inverse demand function

$$p(Q) = a - Q,$$

where $Q = \sum_{i \in N} q_i$ and $a > c$.

1. Formulate this model as a game in normal form.
2. Find the unique pure-strategy Nash equilibrium.
3. What can you say about equilibrium price and profit when n is large?

2 Hotelling model

Consumers are uniformly distributed on the interval $[0, 1]$. Two sellers, labelled 1 and 2, selling the same good choose their locations $l_1, l_2 \in [0, 1]$ simultaneously. The price is fixed at $p > 0$ and sellers face no costs. Consumers buy from the closest seller, so that the demand for seller i is

$$q_i(l_i, l_j) = \begin{cases} \frac{l_i + l_j}{2} & \text{if } l_i < l_j \\ 1 - \frac{l_i + l_j}{2} & \text{if } l_i > l_j \\ \frac{1}{2} & \text{otherwise.} \end{cases}$$

Find the unique pure-strategy Nash equilibrium.