

APEC8003: Recitation 3

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Big picture

Assignment 1:

- Romeo and Juliet, Battle of Sexes
- Iterated strict dominance
 - If strategy A is dominated by strategy B for player 1, then there is no mixed strategy by player 2 that will make player 1 put any positive probability on playing B.
- Public goods game

Assignment 2:

- Monopolist, Two-part tariff
- Edgeworth cycle
- Cournot, Bertrand, and cartel outcome
- Hotelling model of spatial competition
- Strategic Commitment in Two-Stage Games
- Infinitely repeated games: trigger strategy
- Tariffs and imperfect international competition

Problem 3, Midterm Spring 2023

Practice for Two-part tariff

The Mega-Meta Corporation is a monopolist in the production of game theory software. There are N consumers of this software, $i = 1, 2, \dots, N$. Each consumer i has an inverse demand curve: $P_i(Q_i) = a - Q_i$, where P_i is the price to consumer i , and Q_i is quantity sold to consumer i . Assume there is a fixed cost, F , to develop the software, but no cost for distributing the software (zero marginal cost). The cost function for Mega-Meta is: $C(Q) = F$, where $Q = \sum_{i=1}^N Q_i$ (note: C does not depend on Q because marginal cost is zero).

- a.** Suppose Mega-Meta chooses a quantity to sell to consumer i . What is the profit maximizing quantity to sell to consumer i . How much profit does Mega-Meta make over all N consumers?
- b.** Now suppose that Mega-Meta charges a two-part tariff for each consumer: $T_i(Q_i) = x + yQ_i$, where x is a fixed fee ("gate fee") and y is a price per unit. What is the profit maximizing two-part tariff to charge each consumer? How much profit does Mega-Meta make over all N consumers?

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Problem 3, Midterm Spring 2023 (continue)

c. Finally suppose that Mega-Meta faces potential competition from Twenty-Cent Inc. Assume that Mega-Meta moves first and chooses a quantity to produce for each consumer (Q_{i1}). Next, Twenty-Cent decides whether or not to enter. If it enters, it pays a fixed cost of F , and then it chooses a quantity to sell to each consumer (Q_{i2}). If it doesn't enter, then Twenty-Cent earns a 0 payoff and Mega-Meta remains a monopolist.

(i) Suppose that Mega-Meta anticipates entry and produces as a Stackelberg leader and Twenty-Cent plays as a Stackelberg follower. What is the Stackelberg equilibrium?

(ii) How much would Mega-Meta need to sell to each consumer in order to convince Twenty-Cent not to enter?

(iii) Suppose that $a = 12$, $N = 100$, and $F = 400$. What is the subgame perfect equilibrium in this case?