

# Practice Exercises on Hotelling Model of Product Differentiation and Aggregate Demand with and Without Price Discrimination

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February 29, 2008

1. There are only 9 equally distributed people in the mile long  $\bar{x}=1$  town of Couch Potato Texas. Gresebomm's Fries is a gourmet french fry stand franchise. His costs consists  $MC = 1$  for lard and  $FC = 3$  for the stand. Everyone loves a serving of Gresebomm's fries about as much as they love \$10, but all suffer a travel cost from walking of  $t = \$2$  per mile. From the above equations, this means  $a = 10, t = 2, N = 9, c = 1, FC = 3, \bar{x} = 1$ .
  - a) Where would these be located?
  - b) What price would it charge?
  - c) What would be the socially optimal number of outlets?
2. The sleepy town of Couch Potato has expanded into the CP Metropolitan area. Now, Gresebomm's has 2 kinds of customers: those who have a high curiosity (H) for what a heart attack feels like and those who have a low curiosity (L). The inverse demand of the H type is:

$$P^H = 2 - q^H$$

and that demand for the L type was

$$P^L = 1 - q^L$$

For each case of  $MC = 0.4, MC = 0.1$  find the following.

- a) What would be the revenue maximizing output? Draw a graph with the individual demands, aggregate demands and the revenue maximizing output.
- b) What would the be Gresebomm's profit maximizing price and quantity, if it could perfectly identify each type of consumer?
- c) What would the be Gresebomm's profit maximizing price and quantity, if it had to set one price for all consumers?