

Problem 2: Due February 17 at 10:00 AM

1. Demand: $P(Q) = b Q^{-\gamma}$
2. Cost: $C_i(q_i) = \frac{1}{2} c_i q_i^2$
3. $b \sim \log N(\mu, \sigma)$
4. $i = 1, 2$
5. $Q = q_1 + q_2$

The firms' wish to maximize their expected profits. Solve for the set of first-order conditions analytically. Then write a computer program that solves for the optimal quantities given any input vector $(a, c_1, c_2, \mu, \sigma)$ using:

1. Newton's method
2. Broyden's method