

**Problem 2: Due February 17 at 10:00 AM**

1. Demand:  $P(Q) = a - bQ$
2. Cost:  $C_i(q) = c_i q$
3.  $b \sim \log N(\mu, \sigma)$
4.  $i = 1, 2$

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