# ECON 321, Assignment 6:
# BP, Chapter 4: 4.1 Stackelberg

1. Read 4.1.1. We'll make an example from the section titled "Quantity Competition."

2. Use Mathematica to set up a simple model where demand is $p(q) = 10-2q$ where $q$ refers to the *sum* of the production of firm 1 and 2. Costs are constant marginal costs $c_1$ and $c_2$.

Make the profit functions. Take the first order conditions for both firms using the timing of the Stackelberg game, i.e. firm 1 chooses $q_1$ and then firm 2 observes $q_1$ and chooses $q_2$.

3. Find the equilibrium quantities, prices, and profits for the general case of costs $c_1$ and $c_2$. What are the numerical values of quantities, prices, and profits for the case where $c_1 = c_2 = 1$? How big is the first mover advantage/disadvantage relative to Cournot (see the results of Assignment 4 for the Cournot case).

4. Read 4.1.3 on commitment and be ready to discuss.

5. Don't forget that all Mathematica assignments should be printed and turned in at the end of class, and all Mathematica code should be well-commented with text cells to explain what you are doing (refer to the handout for class 5 for an example).