Spring 2017
Problem Set #2
Due Tuesday Jan 31, 2:30pm

1. Suppose you are an intern at a company. For a meeting, you are responsible to bring photocopies of the agenda (a one-page sheet, cost is $0.05 each) for everyone attending the meeting. You are told that it is important that everyone has a copy. You do not know exactly how many people will be at the meeting so you are uncertain exactly how many copies to print. You need to forecast the number of people attending. Describe the loss problem. Is the loss function symmetric?

2. Imagine a similar situation, but instead you are told to bring copies of Wooldridge's *Introductory Econometrics*, one per person, which you need to purchase and the cost is $200 per copy. You are told that it would be okay if participants shared copies. Describe the loss problem. Is the loss function similar to question 1, or how is it different?

3. Now imagine that you are told to forecast the change for the upcoming year in the price of one of the minor inputs in your company's production process. Describe this loss problem. Is this loss function (approximately) symmetric?

4. Suppose y is distributed $N(16, 9)$ (mean=16, variance=9)

   (a) Given the loss function $L(e) = e^2$, what is the best point forecast $\hat{y}$ for y?

   (b) What is the 90% forecast interval for y?

   (c) 80% forecast interval?

   (d) 50% forecast interval?

5. On the course website (http://www.ssc.wisc.edu/~bhansen/460/) is posted a STATA data file realgdpgrowth.dta. It contains quarterly observations from 1947q2 to 2016q3 for most categories of U.S. GDP, calculated as quarterly percentage changes at annual rates in real GDP and its component categories. To answer the following questions, it should be sufficient to use the data editor (Data/Data Editor/Browse) and the summarize, detail command (e.g. `summarize gdp, detail`).

   (a) The series *pce_ nondurables* is personal consumption expenditures on nondurable goods. What was the percentage change (annual rate) in 2016q3?

   (b) Assuming growth rates are independent across quarters, so using no other information other than from the summarize command, what is our point forecast for future values of *pce_ nondurables*?

   (c) Using the normal rule, give an 80% forecast interval.

   (d) Using empirical percentiles, give an 80% forecast interval.

6. Repeat question 5 for the series *pce_ durables* is personal consumption expenditures on durable goods.

   (a) What was the percentage change (annual rate) in 2016q3?

   (b) What is our point forecast for future values of *pce_ durables*?

   (c) Using the normal rule, give an 80% forecast interval.

   (d) Using empirical percentiles, give an 80% forecast interval.

   (e) What are the important differences between your answers to questions 5 and 6. Why are there such large differences for these two different components of personal consumption?