50 point homework quiz on February 14, 2006. Please turn in your answers to the questions below for 10 points on the quiz.

All the exercises in this homework are based on real data obtained from industry. You can download the data sets from ITweb (itweb.isye.gatech.edu) where they are posted as text (ASCII) files.

Exercise 1
The data set “stockprices.txt” gives the closing stock prices of a public corporation over a time period of 200 trading days. For investment purposes, you want to forecast the closing stock price the next day. Forecast the closing stock price for the next day using each of the following forecasting methods:

1. **Moving average** Experiment with the number of periods \( m \) to use for the moving average, and present your best results.

2. **Simple exponential smoothing** Experiment with the smoothing constant \( \alpha \), and present your best results.

3. **Double exponential smoothing (Holt’s method)** Experiment with the smoothing constants \( \alpha \) and \( \beta \) and select constants that work well.

For each method, calculate the forecast values for as many (historical) periods as you can and calculate the errors. Plot the errors versus time and calculate the mean squared error. Based on this analysis and any other analysis you think is important, compare the quality of the three forecasting methods.

Exercise 2
You work as a logistics expert for a large company with beer brewing interests (your dream job!?). You are tasked to forecast the sales for the next month. The data set “beerdata.txt” give the monthly sales of beer in megalitres for 476 consecutive months. Use double exponential smoothing (Holt’s method) and triple exponential smoothing (Winter’s method) to forecast the sales for the next month. How long does each method take to “learn” the pattern of the data?

For evaluation purposes, forecast the values for as many historical periods as you can. Compare the forecasts obtained by the two methods. Which method do you believe is more effective for this forecasting task? Justify your comparison with the use of appropriate plots and calculated quantities.