

ISyE 4031 Regression and Forecasting  
Homework 10  
Due April 20, 2016

1. Consider the sales of Tiger Sports Drink data in Table 8.2, page 377. By using Minitab or R or Excel solve (use either the optimum smoothing constants or the values specified in the paranthesis):

- Single exponential smoothing model ( $\alpha = 0.171$ ).
- Double exponential smoothing model ( $\alpha = 1$  and  $\gamma = 0.4$ ).
- Additive Holt-Winters model ( $\alpha = 0.12$ ,  $\gamma = 0.25$ , and  $\delta = 0.5$ ).
- Multiplicative Holt-Winters model ( $\alpha = 0.12$ ,  $\gamma = 0.25$ , and  $\delta = 0.5$ ).

Produce and submit the plots and the accuracy measures (MAPE, MAD, and MSD) for all methods. Compare the performances of the methods by using those accuracy measures. Which method does produce the best results, and why?

2. Solve Exercise 8.14, pages 399.

3. Solve Exercise 9.3, parts (a), (d), and (e), page 438.

4. Consider the sales of Ultra Shine toothpaste data in Table 9.7, page 439. By using R or Minitab (print and submit the relevant computer outputs such as time-series plot, SACs, and SPACs):

- a. Produce the time-series plot (will be similar to Figure 9.14).
- b. Produce SAC and SPAC for the data. Do they indicate that the values are stationary?
- c. Apply the first-differencing transformation to the original values. Produce SAC and SPAC for the first differences. Do they indicate that the values are stationary?