Exam #2: Part II

Business Cycles & Forecasting   Due date: 11/24/2015
Economics 392   Instructor: Dr. I-Ming Chiu

Part II (40%)
General Instructions: Please answer **BOTH** questions in part II using the R software. Please present **all** of your ***detailed outcomes*** and provide ***all of the R codes*** at the end of your **word file**. Additional explanations can then be added by typing into the same word file. Please prepare a cover page that **states your Name** and **staple** all the pages together. Part II will be collected together with Part I of the room test on Tuesday, November 24 in our class meeting. **There is no extension on this test,** so please submit your test on time.

Q1. (20%) The "sale" data can be found on sakai (Resources ⇒ Exam & Others ⇒ Exam#2_Part2). It's a monthly data that ranges from January 2013 to November 2015.
a) What can you find about this "sale" data? Is there any seasonality? trend? Show how you start your initial investigation and present your main ***graphical*** & ***computational*** **findings**. (10%)
b) Please apply two smoothers; Simple Moving Average of order 5 & Centered Moving Average of order 4, on the sale data. Plot the original data and these two smoothers in one diagram. Please use different line styles to distinguish them. (10%)
(Instruction: use default style for the original data, use lty = "dotted" for simple moving average, use lty = "longdash" for centered moving average. You may also want to use different line width, "lwd = 1" is the default, to reveal their differences.)

Q2. (20%) Working as a forecasting specialist, your job is to predict the sale data in December 2015. In your forecasting tool pocket, you have four methods to accomplish this job; they are "Simple Average Method", "Moving Averages Method", "Single Exponential Smoothing Method", and "Adaptive-Response-Rate Single Exponential Smoothing Method".
a) Make a judgment to choose the appropriate "parameters" by your self and present your four predictions using these four methods. You can use the entire data or portion of the data for the prediction purpose. (12%)
[Instruction about "parameters": you don't need to show how you choose the "order" of moving average and the parameter "alpha" in the last two methods; it's your own decision]
b) Choose the best prediction among these four values. Which one would you choose and why? (8%)
[Instruction: the grading of part (b) is based on how you make your judgment by choosing the "best" prediction outcome, so I would like to see the criteria you use; for example, Mean Squared Error (MSE).]