Week 8 Assignments

# Forecasting with Neural Network (25 Points)

1. (20 Points) Do the problem 9.7 on page 201 (all parts)

Forecasting Australian Wine Sales : Figure 6.15 (page 142) shows time plots of monthly sales of six types of Australian wines (red, rose, sweet white, dry white, sparkling, and fortified) for1980-1994. Data available in AustralianWines.csv. The units are thousands of liters. You are hired to obtain short-term forecasts (2-3 months ahead) for each of the six series, and this task will be repeated every month.

1. Would you consider neural networks for this task? Explain why.

* Neural networks could be considered due to their ability to capture complex patterns and handle multivariate time series, but challenges such as interpretability and computational resources should be weighed against potential benefits.

1. Use neural networks to forecast fortified wine sales , as follows:

* Partition the data using the period until December 1993 as the training period.
* Run a neural network using R’s ***nnetar()*** with 11 non-seasonal lags (i.e., p = 11). Leave all other arguments at their default

1. Create a time plot for the actual and forecasted series over the training period. Create also a time plot of the forecast errors for the training period. Interpret what you see in the plots.
2. Use the neural net to forecast sales in January and February 1995.
3. Use R’s ***ets()*** function to automatically select and fit an exponential smoothing model to the training period until December 1993. Which model did ets fit?
4. Use this exponential smoothing model to forecast sales in January and February 1995.
5. Compare and interpret the results