Soumya Joshi
Vandana Anand

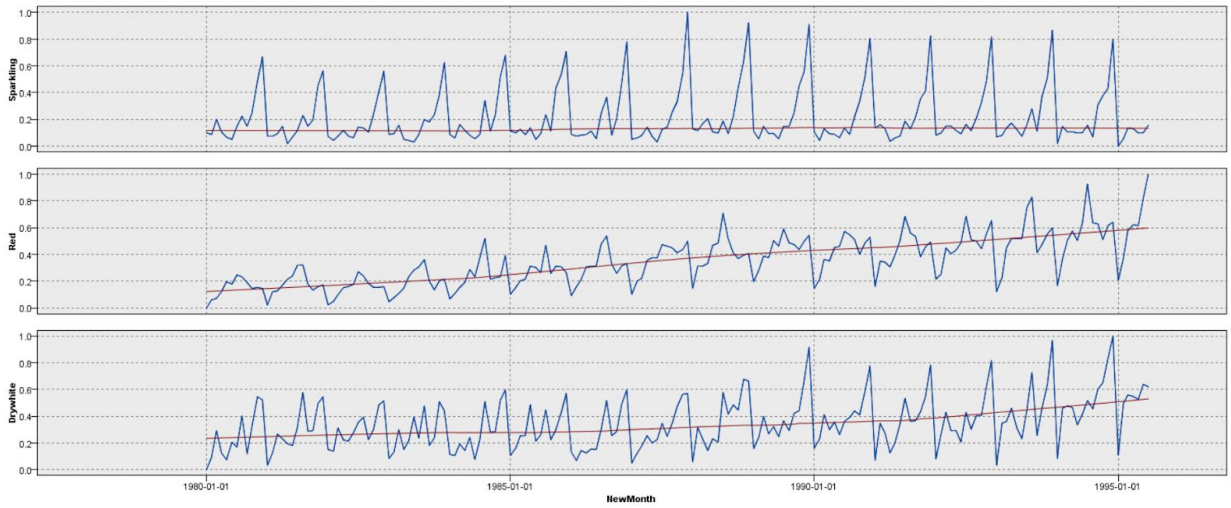
MKT 568

Assignment 3, Spring 2020

Due: April 12th, 11:59 pm
Scoring: Indicated below in (_) (15 points total)

Use the dataset “monthly Australian wine sales” in Module 11 to answer the following questions:

1. **Which type of wine sales show the most obvious seasonality?**



By looking at the graph above, the Sparkling wines have the most obvious seasonality because the steeper spikes start in September and end around January with the peak being in November - December. The peak tends to happen around the same time every year, which can account for seasonality.

2. **Which model among Exponential Smoothing, Holt, Holt Winters is best used to model this dataset?**

Criteria	**Exponential Smoothing**	**Holt Model**	**Holt-Winters Model**
Trends	No	Yes	Yes
Seasonality	No	No	Yes

The dataset is used for forecasting sales of different types of Wines, which is a drink highly dependent upon weather and temperature as well as on food trends that can change over the years. Therefore, the Holt Winters model is the best time series model for this dataset as it can predict both trend and seasonality. This way, it can help us decide which wine sales peak in which season and which type of wine is becoming popular overtime. It can ultimately help increase the wine sales based on knowing the trends and seasonality.

3. **Compare the time series of DryWhite and Sparkling wines. How are they different?**

They are different because the spikes of the Sparkling wine are steeper than the spikes of the DryWhite wine, yielding a more obvious and apparent seasonality for the sparkling wine. For the DryWhite wine, the overall spikes are much more frequent as well as increase and decrease a lot more than the sparkling wine, starting especially from January 1990. The line for DryWhite also starts to increase as the months go by whereas for the sparkling wine the spikes occur close to the same time interval every year and its line is almost constant, signaling that there is not much change.

4. **In what way are they similar?**

They are similar because the spikes for both Sparkling and DryWhite wine occur from almost the same time intervals ranging from the months of September to January, especially starting in January 1990.

5. **Why do we expect Sparkling wines sales can be increased?**

We can expect that the Sparkling wines sales increase especially during the September to January timeframe every year because of the holiday season when people are more likely to buy more wine, with Thanksgiving being in November, Christmas in December, and New Year's in January.

6. **How might you achieve this?**

We can achieve increased sales for the sparkling wine by featuring promotions, discounts, and ads that will also serve to stand out against competitors.

7. **On the last slide in this module, I showed a time series of Boston's September temperatures, calculated as a moving average. What is the period of that moving average and why?**

The moving average in Boston's September time series is the weighted average of all previous years' temperatures which have deviated from the mean of the series. To calculate the moving average in 2018, we would need the weighted average from all the previous years, from 1872 to 2017, totaling a period of 145 years.