RStudio Lab Week 10 – Time Series Week 1

1. Load the following packages using the library function:

- forecast
- fpp2 (or fpp3)
- ggplot2

If any of the above packages are not in the library, you will need to install them using the install.packages function, and then use the library function again to load them.

2. Assign the wineind dataset in the forecast package to an object called df.

3. Ensure the time series is of the correct format by using the as.ts function. Save the result as an object with the name df2.

4. Print the df2 dataset to the console and plot the dataset using autoplot. Give the plot an appropriate title and y-axis label.

5. What components are present in this time series? Describe them fully.

6. What would the appropriate value of k be to use MA(k) smoothing to remove the seasonality from this time series?

7. Compute the CMA(k) value for July 1985 (either by hand or using the data and code, using the value for k from (5)).

8. Calculate the CMA(k) series (using the value for k from your answer in (5)) and add it to the plot of the data using the autolayer() function. Does your smoothed series remove the seasonality?

9. Fit a classical decomposition model using the decompose() function and assuming a multiplicative model. Save the result in an object called decomp. Print the decomp object in the console and look at the values.

    a) Do you think there is cyclicality in this time series? Justify your answer by referring to the classical decomposition output.
    b) In which month do you expect to see the lowest wine sales?