

AAEC 4984/5484: Applied Economic Forecasting

Put your name here

Homework #2 - Spring 2022

The purpose of this assignment is to enhance your understanding of time series and data patterns. It is intended to be rather straightforward and simple.

Instructions:

- Where necessary, please ensure that your graphs and visuals have properly titles and axes labels.
- Recall that you can use `help()` to find out about the data in each series.

Question 1: Visualizing Time Series Data

Create time plots of the following time series: `bicoal`, `chicken`, `dole`, `usdeaths`, `lynx`, `goog`, `writing`, `fancy`, `a10`, `h02`.

- Please use the `grid.arrange` function of the `gridExtra` package to arrange your plots as a 5 x 2 grid. Below, I have provided the base code to achieve this.

```
# To display your graphs, remember to delete the eval = FALSE code chunk option.  
# Edit the height etc to match your preference.  
g1 <- autoplot(.) + labs(title = ".", x = "" , y = " ")  
g2 <- "..."  
g3 <- "..."  
g4 <- "..."  
g5 <- "..."  
g6 <- "..."  
g7 <- "..."  
g8 <- "..."  
g9 <- "..."  
g10 <- "..."  
  
gridExtra::grid.arrange(....., nrow=5,ncol=2)
```

Question 2: Assessing Seasonality

- i. Use the `ggseasonplot()`, `ggsubseriesplot()`, and `ggAcf` functions to explore possible seasonality in the following time series: `writing`, `fancy`, `a10`, `h02`.
 - Please use the `grid.arrange` function of the `gridExtra` package to arrange your plots. You are free to organize them by chart type or series.
 - **It might be useful to set the max lag in the ACF to 36 so that you can see a fair bit of the patterns in the correlogram.**
- ii. What can you say about the seasonal patterns?
- iii. Can you identify any unusual years?

Question 3: White Noise?

`goog` contains closing stock prices of Google Inc., now Alphabet Inc. (GOOG), from the NASDAQ exchange, for 1000 consecutive trading days between 25 February 2013 and 13 February 2017.

- i. Plot this series and its ACF. Comment on any pattern noticed in both. Does this series look like white noise?
- ii. Now, use `dgoog <- diff(goog)` to compute the daily changes in the index.
- iii. Produce an `autoplot` of `dgoog` and its `ggAcf`. Do the changes in the Daily Google Stock prices look like white noise? **Recall that a simple yes will not suffice. You will need to explain your conclusion.**