Applied Economic Forecasting

Put your name here

Homework #1b - Spring 2021

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.
- **For your convenience, I have posted my R markdown file on our course website so that you can open and alter as you see fit.**
- Refer to the output, whenever appropriate, when discussing the results.

Question 1: Visualizing Time Series Data

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

- To allow multiple graphs on your page, please arrange your plots as grids. Below, I have provided the base code to achieve this (*Note: you will need to install the* ***`gridExtra`*** *package in your console before calling the* ***`grid.arrange`*** *command*):

```
# To display your graphs, replace `eval = FALSE` with `include = TRUE`. Edit
# accordingly!
g1 <- autoplot(.) + labs(title = ".", x = "", y = "  ")
g2 <- "..."
g3 <- "..."
g4 <- "..."
g5 <- "..."
g6 <- "..."
g7 <- "..."
g8 <- "..."
g9 <- "..."
g10 <- "..."

gridExtra::grid.arrange(g1, g2, g3, g4, g5, g6, g7, g8, g9, g10, nrow = 5, ncol = 2,
    newpage = TRUE)
```

Question 2: Assessing Seasonality

i. Use the `ggseasonplot()`, `ggsubseriesplot()`, and `ggAcf`[1] functions to explore possible seasonality in the following time series: `writing`, `fancy`, `a10`, `h02`.

ii. What can you say about the seasonal patterns?

iii. Can you identify any unusual years?

[1] 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.

Question 3: White Noise

`dj` contains 292 consecutive trading days of the Dow Jones Index.

i. Plot this series and its ACF. Comment on any pattern noticed in both. Does this series look like white noise?

ii. Now, use `ddj <- diff(dj)` to compute the daily changes in the index.

iii. Plot `ddj` and its ACF. Do the changes in the Dow Jones Index look like white noise?