Assignment #1

In this assignment, you will download the listed dataset, and practice implementing some of the concepts we have discussed in class. You must submit your completed results, code, and some brief commentary about the results via a Dropbox submission folder on the course D2L website.

1. Download the following datasets:

A. **Minimum Daily Temperatures Dataset:** This dataset describes the minimum daily temperatures over 10 years (1981-1990) in the city Melbourne, Australia. The units are in degrees Celsius and there are 3650 observations. The source of the data is credited as the Australian Bureau of Meteorology.
Source:https://raw.githubusercontent.com/jbrownlee/Datasets/master/daily-min-temperatures.csv

B. **Monthly Sunspot Dataset:** This dataset describes a monthly count of the number of observed sunspots for just over 230 years (1749-1983). The units are a count and there are 2,820 observations. The source of the dataset is credited to Andrews & Herzberg (1985).
Source:https://raw.githubusercontent.com/jbrownlee/Datasets/master/monthly-sunspots.csv

2. For each dataset, visualize the raw signals, identify any trends, seasonality, and/or other components, and try to remove them. Remember that you are not limited to the tools shown in the tutorial and should explore the various concepts discussed in class. You do not need to explain the theory behind the approaches, but you should provide justification for their use, and discussion of their results.

3. For each dataset, examine the stationarity of the residuals using the ACF and PACF functions, Lag Plots, and/or other approaches. Show your results and provide commentary about your observations.

4. Try modeling the residuals as an AR process. Use the tools at your disposal to decide on an appropriate order and analyse the results. What is the impact of selecting different orders on the remaining residuals?

5. Summarize your findings and observations briefly in a final discussion. Submit both the developed code and your document to the Assignment 1 folder on D2L.