Griffin Shelor

30-1-2024

Ecological Forecasting

Lab 2

1. A graph of different types of time

   Description automatically generated with medium confidenceWhen plotting the decomposed time series data for minimum temperature, it is clear that there is a long term trend of minimum temperatures increasing. However, the seasonal trend is consistent throughout the whole time period, with large fluctuations between summer and winter. Using monthly means gives us a visualization that is more helpful for clearly delineating the temperature fluctuation between seasons, but does not produce anything much different from the seasonal trend for either additive or multiplicative. For maximum temperature, the same trend does not appear to show up throughout the time series, although the tail towards the end of the time series appears somewhat similar. The seasonal trend for tmax appears similar to the seasonal trend for tmin.

A graph of different types of time

Description automatically generated with medium confidenceA line graph with numbers and points

Description automatically generatedA graph of different types of time

Description automatically generated with medium confidenceA graph of different types of time

Description automatically generated with medium confidence

1. I believe the circular patterns can potentially be explained by the fact that they largely occur after a number of months where the season would be changing but not in a diametrically opposite sort of way, such as after 2-4 months or after 8-10 months. What I mean by this is that these time differences would typically not represent a full change from Summer to Winter or vice versa. This means that transitions from fall to spring, spring to summer, etc., could all result in very different correlations with some negative and some positive.

A collage of images of different shapes

Description automatically generated

1. There is autocorrelation in the tmin data. It appears to occur in lags of 5 months, after which the autocorrelation shifts direction from being positively correlated to being negatively correlated or vice versa. There is some partial autocorrelation as well, although the lag is much shorter, occurring with a lag of 1 month before flipping from positive correlation to negative correlation. The partial correlation disappears after 1 year.

A graph with blue lines and text

Description automatically generatedA graph with lines and text

Description automatically generated