Seasonal Time Seires

A seasonal time series is made of 3 parts, the trend, the seasonal component and th residual.

We can use the seasonal\_decompose method of the class statsmodels.tsa.seasonal.

Then we can pass in the dataframe and the frequency ( number of data points in each cycle) into the method.

We can store this data in a object which can be later used with the plot function fro visualisation.

We can use the ACF plot to find out the peek and hence the period.

Before plotting the ACF, we need to de-trend the time series in order to make it stationary.

This can be easily done using the rolling mean method.

i.e, df = df – df.rolling(N).mean()

df = df.dropna()

Now , the SARIMA models can be fitted exactly as ARIMA models , the difference being the need to specify the seasonal\_orders.

In order to find the seasonal orders, the same plot\_acf and \_pacf functions can be used but this time taking the lags as the multiplicants of the peak value(period).

In order to find the best order, we can use the package pmdarima and its function auto\_arima() in order to find the best orders possible. The resulting object has a similar .summary() and .plot\_diagnostics method.

Once you have a model , we can save this model to a filepath. This can be done using a package called joblib package. Using the dump function of this package specifying the models result object and the filepath.

To use it again , we can use the joblib.load function specifying the filepath and then storing it into an object.

We can and should update a model with new collected data using pmdarima’s update function specifying the new data.

