Timeseries Forecast

Introduction

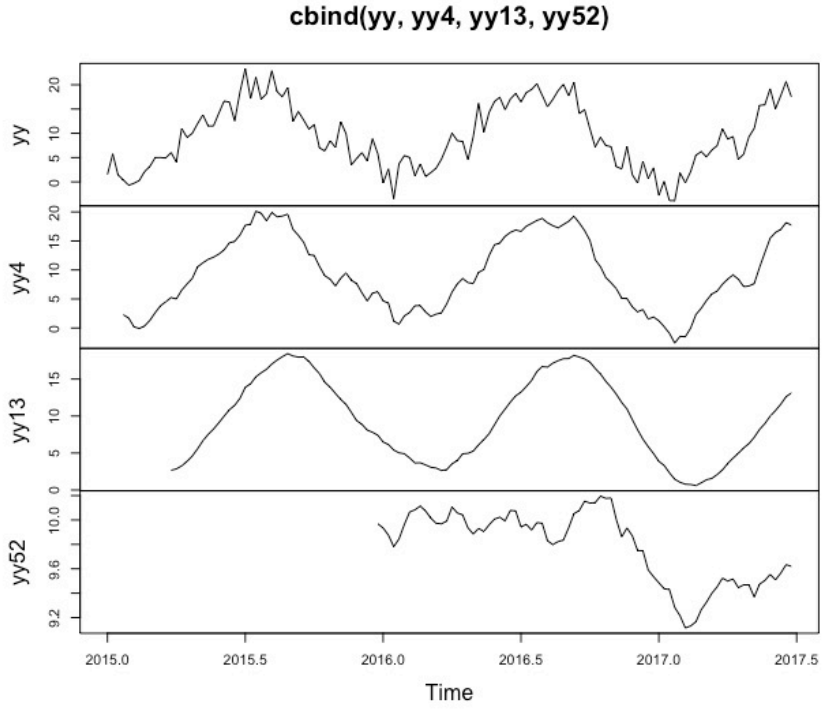
We are given the data of average temperatures for 2.5 years. As we know the temperature today could be predicted based on the temperature the previous day. Though the weather changes every day, the temperature follows a seasonal pattern.

Problem Statement

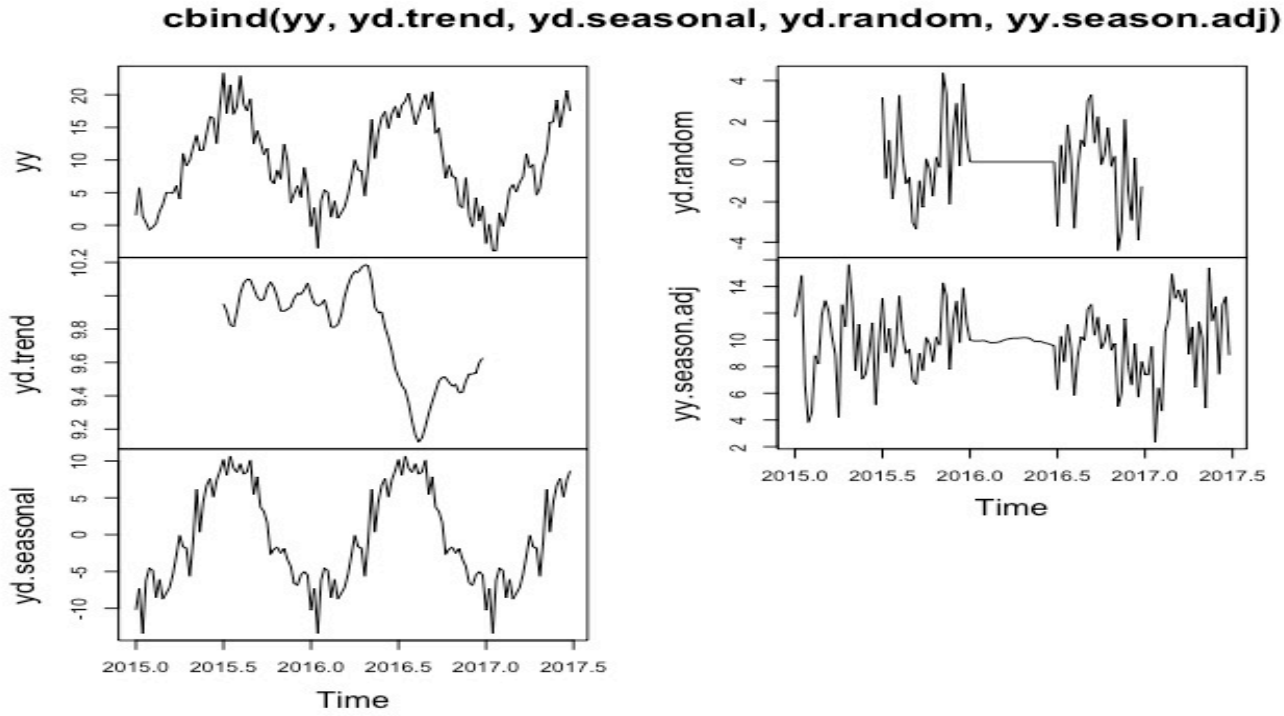
In the temperature data, we are going to observe if there is any seasonality or trend in the temperature pattern. Based on the pattern, we choose the appropriate Holt Winter's exponential smoothing model and predict the temperature for the next 26 weeks.

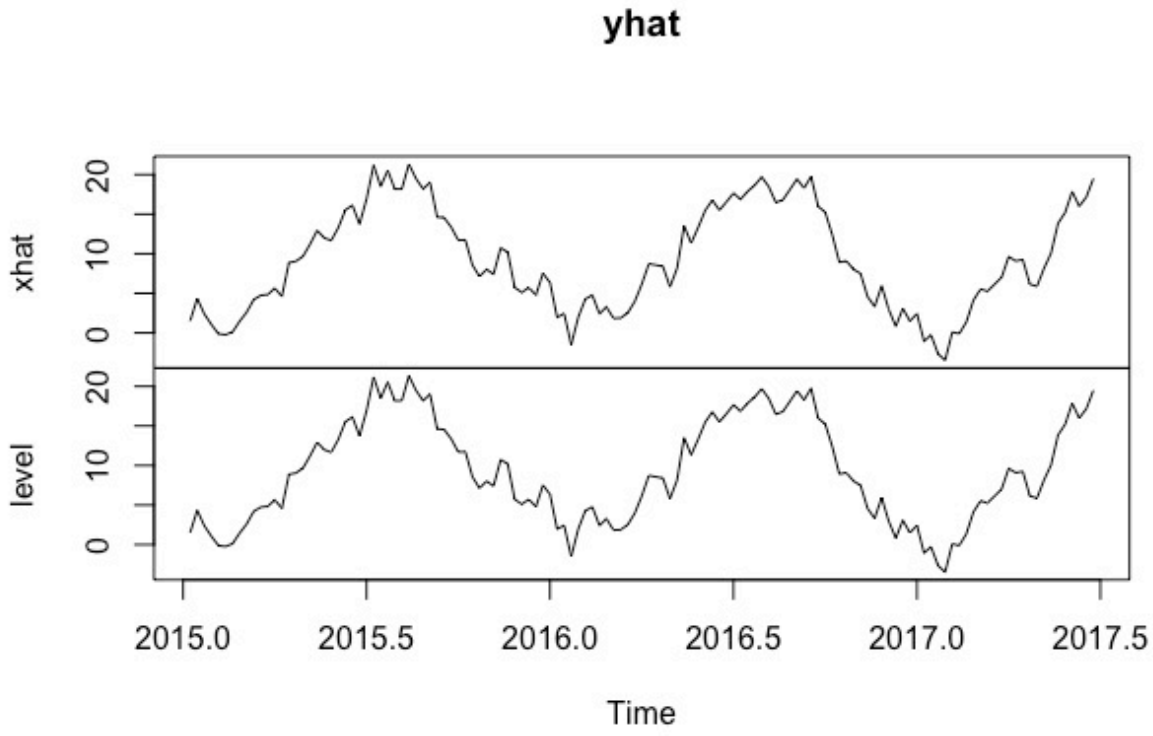
Moving Average:

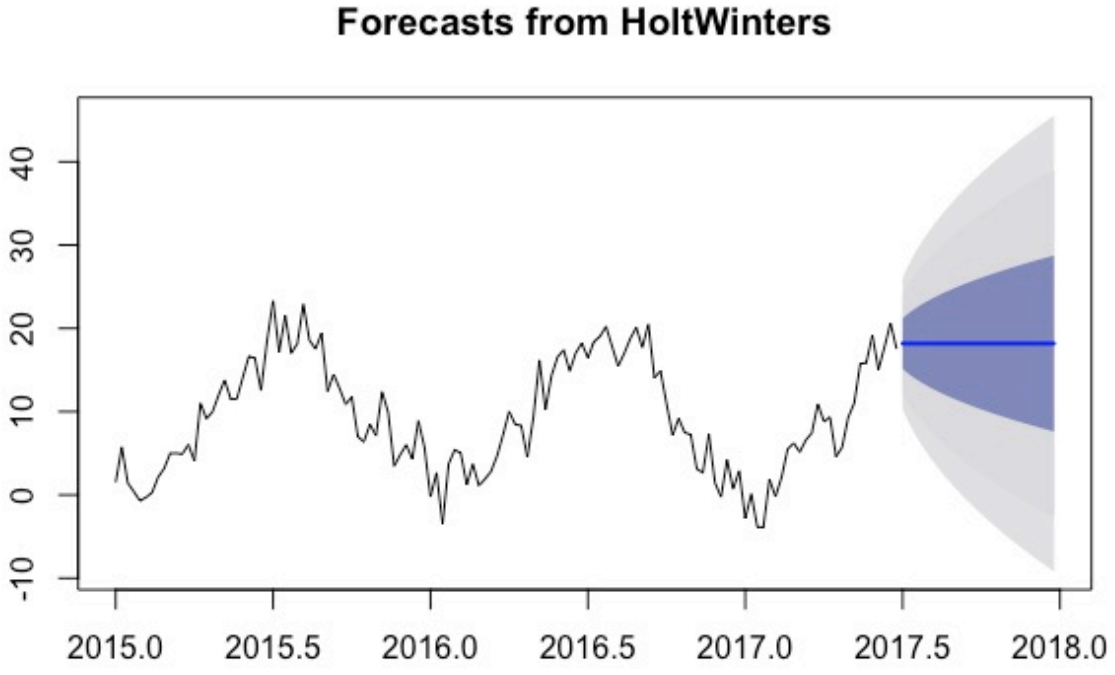
After smoothing the data, we are trying to deduce if there is any pattern in the seasonality of the data. Below if the timeseries data after smoothing over 4 weeks, 13 weeks, 52 weeks.



We can find some pattern in the seasonality.
Now, we decompose our temperature data to get trend, seasonality.




yhat
xhat
level
0
10
20
2015.0
2015.5
2016.0
2016.5
2017.0
2017.5
Time


Forecasts from HoltWinters
-10
0
10
20
30
40
2015.0
2015.5
2016.0
2016.5
2017.0
2017.5
2018.0