

Forecasting, Exercises

David Pisinger

To be handed in Monday 1/10

- 1 As part of the model calibration, one will often run the forecasting procedure for the whole time series X_1, \dots, X_t several times for various smoothing parameters, and calculate the total error. What is the time complexity of evaluating the time series X_1, \dots, X_t if
 - a Moving average is used
 - b Weighted moving average is used
 - c Exponential smoothing is used

Briefly outline the algorithm to support your answer.

- 2 The Holt-Winter forecasting method is able to handle trend and seasonal pattern. Assume that two seasonal patterns $S_1^1, \dots, S_{s_1}^1$ and $S_1^2, \dots, S_{s_2}^2$ are present with different cycle time s_1 and s_2 . Discuss whether the Holt-Winter forecasting method can be extended to handle the two patterns. (If yes, show the equations, if no, argue why not).
- 3 Discuss where a multiplicative trend component can be applied.