Time series prediction: methods to predict variables as a function of time

Data: We are given the values of some variable f(ti) for different time points t1, t2, …, tk-1. We want to predict f(tk) at time tk.

ARIMA

Standard popular statistical model for time series prediction. Briefly ARIMA performs linear regression on a moving window.

Regression:

Learn a regression model on the input data. For example:

- Linear regression
- Ridge (kernel) regression
- Support vector regression
- Decision trees
- Random forest

Binning:

By binning regression target values we can transform our problem into a classification one.

Long short term memory (LSTM) encoding:

Rearrange data into a form where we use previous data patterns to predict the next time point

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Recurrent neural networks

Like a typical feed forward neural network except there are connections to adjacent nodes

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LSTM neural networks

Like recurrent neural networks but use special LSTM nodes

Making several time predictions into the future

We can try to make several predictions at the same time by either making one prediction at a time and use the prediction to augment the data or we use a multi-label output classifier

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