10. Forecasting with AR(p) model

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Exercises due Nov 10, 2021 17:29 IST Completed

Forecasting with AR(p) model

Start of transcript. Skip to the end.

Prof Jegelka: Now we've decided we want an autoregressive model.

We've looked at how we can fit it.

And next thing, we actually want to make predictions from it.

So now we want to make predictions into the future

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Get long-term predictions

1/1 point (graded)

What are potential ways to get more useful long-term predictions with $\mathbf{AR}\,(p)$ model?

- [ ] Increasing the order of model p
- [ ] Decreasing the order of model p
- [x] Increasing the time step between measurements
- [ ] Decreasing the time step between measurements
- [x] Modeling the trend and seasonality separately

✔

Solution:

$\mathbf{AR}\,(p)$ model is usually not very useful for long term prediction. As we saw in the lecture video, the long term prediction of $\mathbf{AR}\,(p)$ model will converge to a constant value (the unconditional mean of the time series). This fact will not be changed by changing the order of model p.

Generally speaking, this converging process will happen within a few time steps. Therefore one way to get longer term prediction is to increase the time step between different measurements. For example, with daily time series data, it may be hard to predict the values 30 days ahead (30 time steps ahead); but if we first average the daily data into weekly data, then we might be able to predict the value for next month or so (only 4 time steps ahead). Of course, whether or not to average raw data (e.g., daily data) into data with longer time steps (e.g., weekly data) depends on the data generating process and the questions we want to address.

Another way is to model the trend and seasonality separately. The trend and seasonality will be there while making long-term predictions.

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Answers are displayed within the problem

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Confidence intervals?

question posted about a month ago by anonymous

Hi! How (math) and why (math/intuition) the confidence intervals become larger as we predict more in the future?

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