## GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

INSTITUTE OF COMPUTER SCIENCE

Software Engineering for Distributed Systems http://www.swe.informatik.uni-goettingen.de

**Data Science and Big Data Analytics** 

WS 2016/2017 Dr. Steffen Herbold

Exercise 5 · Due at 2016-01-12



## Timeseries Analysis with ARIMA

Execute the following tasks with  $R^1$ :

- 1. Load the library forecast. You may have to install it.
- 2. Load the data with scan("http://robjhyndman.com/tsdldata/data/nybirths.dat")
- 3. The data is monthly and starts in the year 1946. Create an appropriate time series object.
- 4. Decompose the data into the trend, the seasonal influences and the random influences. Plot the results of the decomposition.
- 5. Calculate an adjusted time series without the seasonal effects.
- 6. Use the adjusted time series to
  - train an ARIMA model with the parameters p = q = d = 1.
  - train an ARIMA model with automatically guessed parameters for p,q and d (Hint: auto.arima).
- 7. Forecast the next 12 months using both trained models and plot the results (Hint: forecast.Arima).

<sup>&</sup>lt;sup>1</sup>You can start RStudio typing rstudio into the bash in the CIP pool.