Dear Prof. Fengler,

we have decided to model the time series of the flow rate of the river Rhine in Basel with the methods we learned in class.

The data we use can be found [here](#).

And a first inspectional plot can be found [here](#).

Business Case

The river Rhine, which rises from the Alps and flows into the northern sea, is used as an energy source by many of its neighbouring countries. The output of the installed hydroelectric power stations is hard to predict and depends on many factors, such as the flow rate. An accurate prediction allows power suppliers to better plan their energy mix and minimize their costs as well as the use of fossil fuel burning power plants.

We will focus on modelling and decomposing the time series of flow rate of the river Rhine in Basel with the methods we have learned in class to reduce a general time series of the form $y_t = m_t + s_t + u_t$ by modelling u_t with $\hat{u}_t = f(u_i) : i \in T \,\&\, i < t$ to reduce $y_t - m_t - s_t - \hat{u}_t$ to white noise.

Sebastian Behrens
Felix Sewing