

# Homework 1

Solve this homework in groups of four students. Create an R-project named Homework1 and use R Markdown to solve the task below. The output of your .Rmd-file should be a pdf of at most 10 pages. Your submission should be Homework1.zip (containing the .Rmd file and its .pdf output, an .rds and the raw data). Make sure that your code run! For the whole solution, stick to what we have discussed so far in class!!! Refer to the slide for the codes used, and justify any additional codes used.

## Tasks

- 1- Collect the following three datasets: Personal Saving Rate and Unemployment and Population (hover over names to see the links). Merge these three datasets and get a tsibble object. Produce and describe the timeplots of unemployment and personal saving rate. Consider seasonal or subseries plots, if necessary.
- 2- We would like to visualize how the ruling party and the election year affect unemployment and personal saving rate. Recreate the timeplots with the ruling parties shown by their color. Indicate also the election years on your plots. Start from Carter's presidency.
- 3- Decompose the personal saving rate series using a centered moving average. Graph the season-adjusted data. Explain whether the remainder is a white noise. If you believe that a transformation could be useful before decomposing, then please do it. Compare your decomposition to the STL decomposition.
- 4- We would like to forecast unemployment in Switzerland. Collect the unemployment data for the last years (at least 10 years) broken down to Cantons. Your data could also contains additional information like size (population, area) and any other information you think could be helpful in predicting unemployment. Create a tsibble object from your data. Use `write_rds()` to save your data. Give a single plot that gives an overview of the seasonal and trend strength of unemployment by cantons.
- 5- Before embarking on a forecasting exercise, we should always consider the purpose of forecast, the information available and the value of the forecast. Discuss these 3 points for the unemployment series in Switzerland. You might need the accompanying SBD1\_PIVASE.pdf file.