

## High Integrity Systems Project

### TSA Tasks 02

Prof. Dr. Matthias F. Wagner  
Cand. PhD. Fatima Sajid Butt

Winter Semester 2023/2024

Let us continue with *Time Series Analysis*:

1. Please install the code of the book *Modern time series forecasting with Python* on your system or Google Colab and check the installation! Explain your experience.
2. Please summarize chapter 1 of the book *Modern time series forecasting with Python*! Explain the *Machine Learning* models used.
3. Please do research on the *predictability* of time series.
4. Please define *forecasting* and give references.
5. Please run the corresponding code of chapter 1, comment the code and explain it! Please explain also errors and how you solved them!
6. Please summarize chapter 2 of the book *Modern time series forecasting with Python*! Explain the necessary mathematics.
7. Please explain the *data preprocessing* and give references.
8. Please explain the mathematical handling of *missing data*!
9. Please run the corresponding code of chapter 2, comment the code and explain it! Please explain also errors and how you solved them!
10. Please summarize chapter 3 of the book *Modern time series forecasting with Python*! Explain the necessary mathematics.
11. Please run the corresponding code of chapter 3, comment the code and explain it! Please explain also errors and how you solved them!
12. Please explain the *decomposition* of time series.
13. Please explain the handling of *outliers* in time series.
14. Please install *Matlab/Simulink*!
15. Please explore the possibilities of *visualizing* time series!
16. Show examples of *time series visualization* with Python and Matlab!