Exercise Sheet 2
Intelligent Systems
Design

This exercise sheet will be discussed on November 18, 2020

Exercise 1 - Observer/Controller Pattern

Explain the Observer/Controller pattern by choosing your own example. In detail, start with a real-world application and explain how the system can be optimised with the O/C Pattern by Observation and Control.

Exercise 2 - Distribution variants

These distributed systems are given:

- P2P Network
- VCS GIT
- Ant colony
- Internet

A. Classify each system into one of the categories: *fully centralised*, *fully decentralised* and *hybrid*.
B. Explain your decision by describing communication channels, process flows and autonomy level.

Exercise 3 - Python Visualisation

A. Download water level data for the time period **20 October – 10 November, 2020**
   The Kiel data is provided by the German government agency "Wasserstraßen- und Schifffahrtsamt":
   https://www.pegelonline.wsv.de/webservices/files/Wasserstand+Rohdaten/OSTSEE/LT+KIEL
B. Load the data into a single *pandas* dataframe.
C. Visualise the dataframe using the *matplotlib* package.
D. Approximate the water levels with the *numpy.polyfit* function.