Kiel University
Christian-Albrechts-Universität zu Kiel

Exercise Sheet 1
Intelligent Systems
November 11, 2020

Organisation and Introduction

Welcome to the course *Intelligent Systems*. During this semester, our eponymous working group is looking forward to introduce you to the fields of *Intelligent Systems*, *Organic Computing* and *Autonomous Learning*. The exercises are meant to reflect upon the learned concepts, find different scenarios and their applications. Solutions will be discussed during lessons. *They do not need to be submitted*. These solutions may take the form of (hand)written text, source code or presentations. The first exercise lesson will take place during the online session on Wednesday, the 11th of November.

Exercise 1 - Prerequisites and Tutorial

During the exercise we will run our code in a Jupyter notebook environment. This means you need to have computer with a browser at hand.

A. Follow the Anaconda installation guide (→ OpenOlat → *Install_ Anaconda_ en.pdf*). This will also install the Jupyter notebook environment.

B. Install the suggested package and find out more about the following packages:
   - NumPy (→ https://numpy.org/devdocs/user/quickstart.html)
   - scikit-learn (→ https://scikit-learn.org/stable/tutorial/basic/tutorial.html)
   - pandas (→ https://pandas.pydata.org/pandas-docs/stable/getting_started)

C. NumPy and pandas are both featuring a new kind of data structure. Explain the data structures of NumPy and pandas in more detail and mention the differences.

D. Try to find out more about the following basic concepts of Python:
   - Simple data structures: list, dictionaries, list comprehensions, ...
   - Control flows: loops, if-then-else statements, ...
   - Definition and usage of functions
   - Import of packages and modules

E. To try out things in your free time – which we recommend:

   Install IPython (→ http://ipython.org/install.html) with the notebook extension on your own machine.

   In case you prefer a full-sized IDE, you should have a look at the community edition of PyCharm (→ https://www.jetbrains.com/pycharm/). An alternative (and very extensible) IDE is VSCode (→ https://code.visualstudio.com/).