

Exercise 0 on Machine Learning WS 2023/24

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## Task 0. Installation

For the exercises (and hackathon), you will need to become familiar with the Python programming language (<https://www.python.org/>), the package manager Conda (<https://docs.conda.io/en/latest/>), and the Jupyter Notebook programming environment (<https://jupyter.org/>).

In Anaconda (<https://www.anaconda.com/products/individual>) the required programs are included. Alternatively, you can use miniconda (<https://docs.conda.io/en/latest/miniconda.html>) to save disk space.

## Task 1. (1 Point)

For this task you will need numpy (<https://numpy.org/>). In Anaconda numpy should already be preinstalled. But if you have miniconda installed, you may need to install numpy. You can install the numpy package via the terminal with the following command:

```
conda install numpy
```

Create a Jupyter notebook and import numpy in one cell. In another cell, calculate the binary logarithm of 65536. The command is:

```
numpy.log2(65536)
```

Save the notebook and add it to your submission.

## Task 2. (1 Point)

To avoid version conflicts and simplify installations, Python programs often add *environment files*, specifying the packages used and their versions. Package managers like Conda can use such a file to automatically install the required packages in an encapsulated environment. Familiarize yourself with the use of Conda environments (<https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html>). Create an empty environment named *task2* and install pandas (`conda install pandas`) into this environment while the environment is activated. Export the environment file (name: *task2.yaml*) and add it to the submission.

## Task 3. (2 Points)

In the folder *data*, you will find the files *example\_data.yaml*, *exercise\_0.ipynb*, *pyyaml1.yaml* and *pyyaml2.yaml*. Create the pyyaml1 and pyyaml2 environments using the environment files and run the code in *exercise\_0.ipynb* in Jupyter Notebook while one of the environments is active at a time. Briefly describe the differences in running the Notebook with the different environments.