1 Setup of Environment

1. Before you start doing this tutorial, write down your starting time! You will be asked how long it took you at the end.

2. As mentioned in the lecture, you should have a programming environment in which you can use the following tools:

   a) python 3 (I am using 3.11, available at python.org/about/gettingstarted)

   b) anaconda (available at anaconda.com/download)

   c) jupyter notebooks (see jupyter.org)

   This tutorial will guide you through the installation steps. If there are any open problems, please post them to the StudIP forum!

3. **Install Anaconda:** Please follow the instructions provided at: docs.anaconda.com/free/anaconda/install/ . After a successful installation your the following command should work:

   ```
   $ python3 --version
   Python 3.11.5
   ```

   The version shown on the terminal should be above 3.8!

4. **Create a new virtual environment for AI3:** To create a new environment where some of the packages that we need in this course are already installed, enter the following command:

   ```
   (base) $ conda create --name AI3ANN
   ```

   Afterwards, you can activate your new environment using this command:

   ```
   (base) $ conda activate AI3ANN
   ```

   Now, the environment should be activated, which looks like this:

   ```
   (AI3ANN) $
   ```

5. Installing some basic packages within this environment:

   ```
   (AI3ANN) $ conda install pandas matplotlib
   ```

6. **Installing jupyter notebooks:** You can either install jupyter notebooks systemwide as described here jupyter.org/install, or within you local virtual environment via the following command:

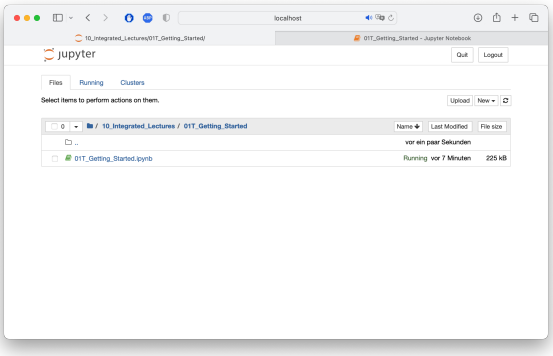
   ```
   (AI3ANN) $ conda install jupyter
   ```

   After a successful installation, the following command should open a browser and show the current directory content:

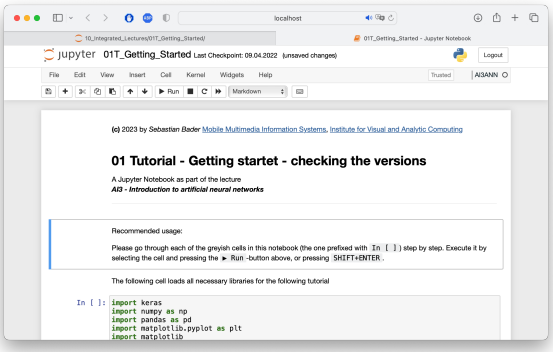
   ```
   (AI3ANN) $ jupyter notebook
   ```

2 A first Neural Network

a) Add the file `01T_Getting_Started.ipynb` from the StudIP to your directory. Your jupyter-notebook website should now look like:



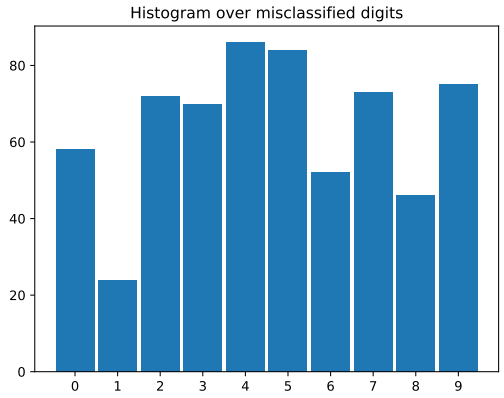
b) Open the file `01T_Getting_Started.ipynb`, which leads you to the following website:



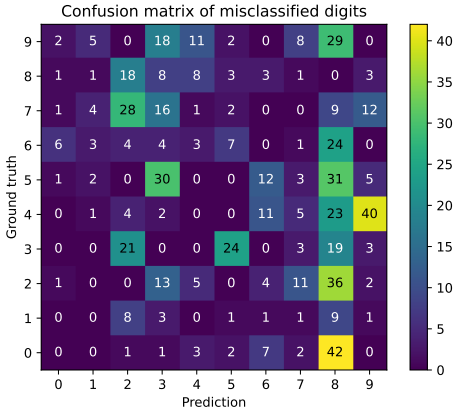
c) Execute the cells of this notebook, which will guide you though a very simple first example.

3 Task to be submitted via StudIP

- Report the accuracy which was obtained during the training above (last number in the cell with the `model.fit(...)`-statement)
- Analyse the misclassified samples by generating a histogram over misclassified digits as shown below:



- Generate a confusion matrix over the misclassified digits as shown below:



- Answer the following question within your Jupyter notebook:
  - How long did it take you to complete the tutorial?
  - What was the hardest part of this tutorial?
  - What do you expect to learn in the lecture AI3?
- **[Task@StudIP: T1]** Upload your full Jupyter notebook into StudIP.