Machine Learning for Health Informatics: Assignments

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GitHub: http://bit.do/MLHI
https://github.com/mdbloice/Machine-Learning-for-Health-Informatics

- Assignments for Übung
- **Three programming assignments** in the semester
- Assignments will be written in **Python**
- They will take the form of **Jupyter Notebooks**
- The assignments will require you to **apply algorithms from the lecture to health data**
- First assignment has **no deliverable**:
  - Get **all requirements installed**!
- Next assignment in ≈1 month

- What is a Jupyter Notebook?
- Jupyter is a **browser-based IDE**, projects take the form of **interactive notebooks**: Demo later
- It is easy to share your notebooks with others
- During the semester I will make available a few **semi-complete notebooks on GitHub:**
  - http://bit.do/MLHI
- Your task would be to **finish the notebooks**
- Send the notebooks to me **by email**

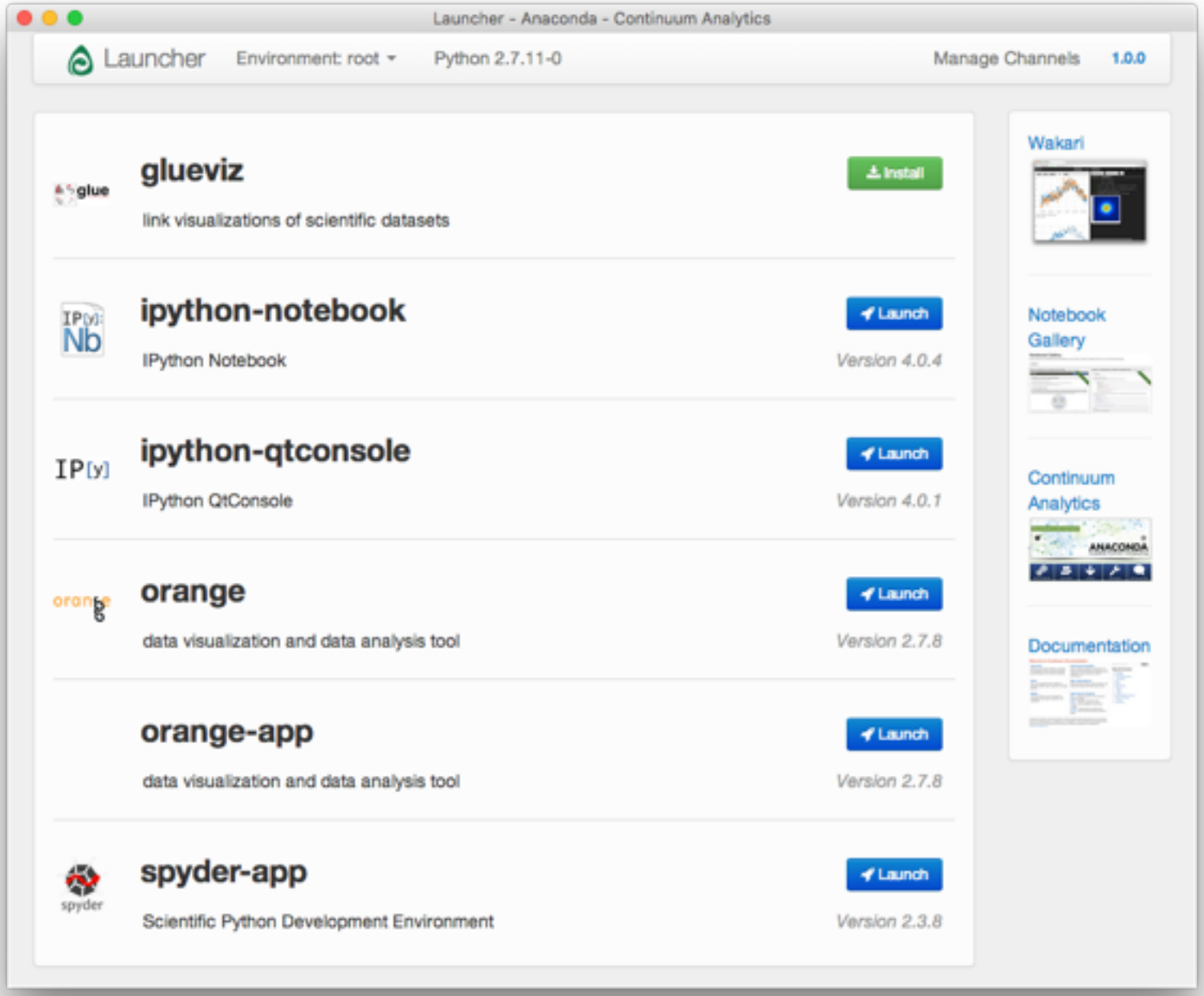
Requirements for the Übung

- You will need an installation of
  - Python
  - Jupyter
- And you will need the following libraries:
  - NumPy (linear algebra)
  - SciKit-Learn (Machine Learning framework)
  - Matplotlib (plotting library)
  - SciPy, Pandas, maybe one or two more
- However: the easiest way is to install the **Anaconda scientific Python distribution**

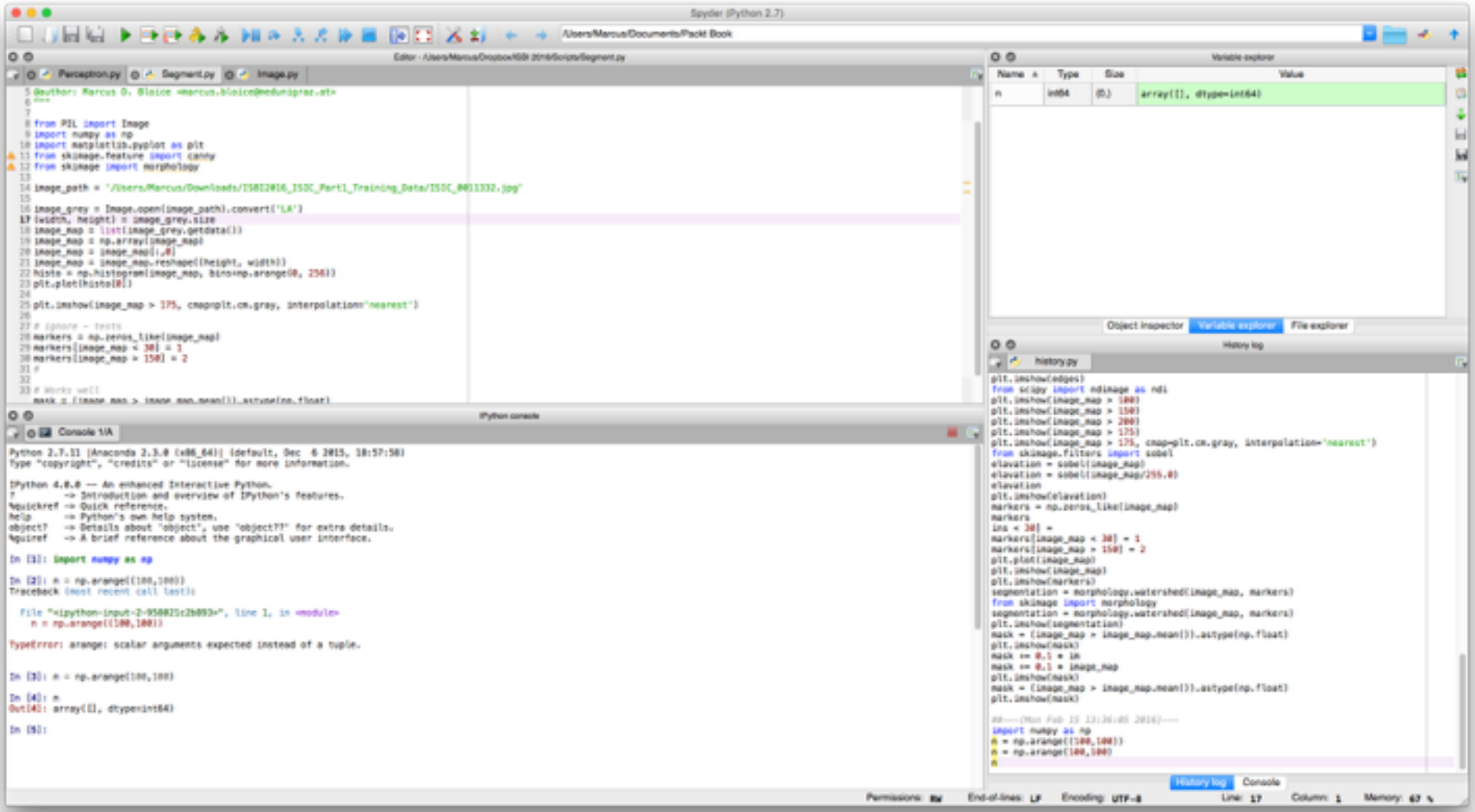
Anaconda

- "Anaconda is a completely free Python distribution. It includes more than 400 of the most popular Python packages for science, math, engineering, and data analysis."
- It also includes **an IDE called Spyder** and several other utilities such as **Jupyter**
- Everything is **configured and ready to use**
- Get it here:
  - https://www.continuum.io/downloads
- **Use the Python 2.7 version!!!**

Launching Anaconda



Spyder IDE


Spyder (Python 2.7)
Perceptron.py
Segment.py
Image.py
Variable explorer
Object inspector
Variable explorer
File explorer
history.py
Console 1/A

Jupyter Notebook

Week 1

localhost:8888/notebooks/Documents/ML%20for%20Health%20Informatics/Machine-Learning-for-Health-Informatics/Week%201.ipynb

jupyter Week 1 Last Checkpoint: 2 hours ago (autosaved)

File Edit View Insert Cell Kernel Help Python 2

Code CellToolbar

```
import numpy as np
%matplotlib inline
```

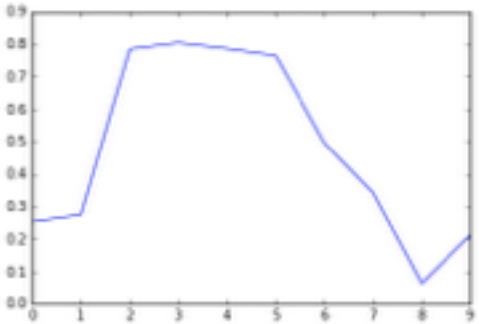
In [10]:
```
n = np.random.rand(10,1)
```

In [11]:
```
n
```

Out[11]:
```
array([[ 0.25300778],
       [ 0.27510245],
       [ 0.78408713],
       [ 0.80365746],
       [ 0.78560733],
       [ 0.76417109],
       [ 0.49633194],
       [ 0.34233513],
       [ 0.06388708],
       [ 0.21190267]])
```

In [12]:
```
plt.plot(n)
```

Out[12]:
```
[<matplotlib.lines.Line2D at 0x10f2a5c90>]
```

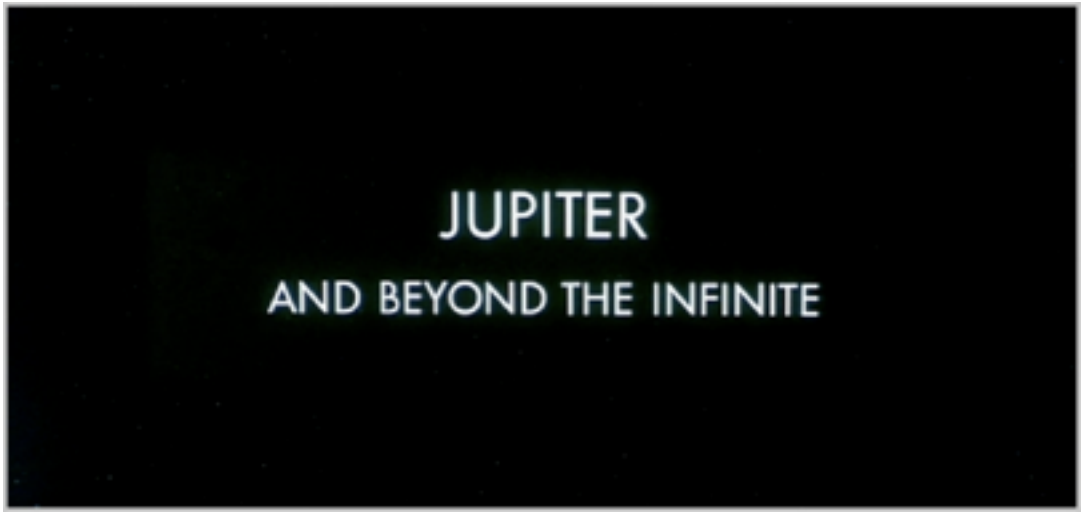


In [ ]:

1. **Install Anaconda**
2. Get the `Week1.ipynb` file from the GitHub repository: http://bit.do/MLHI
3. Make sure **each cell can run without errors**

- There is **NO deliverable** for this assignment!
- If all runs well, then you will be **ready to start machine learning using Python!**
- If a package **does not exist**, use `conda` to install it: for example seaborn:

```
conda install seaborn
```

Jupyter Demo

GitHub: http://bit.do/MLHI