

Machine Learning with Python

Numpy / Matplotlib / Scikit-learn

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Setup

On lab machines



Download and extract the Scikit-learn lecture material from:

https://github.com/geektoni/ml_labs/archive/refs/heads/master.zip

Open the terminal in the folder containing the extracted files and run:

```
> ./jupyter -scikit.sh
```

Setup

On your own machine

Make sure you are using Python 3 for the following steps.

Install Numpy, Scipy, Matplotlib, Scikit-learn and Jupyter:

```
> pip install numpy scipy matplotlib sklearn pandas  
> pip install jupyter
```

Download and extract the material for the Scikit-learn lab:

https://disi.unitn.it/~passerini/teaching/2021-2022/MachineLearning_AIS/index.html

Open the terminal in the folder containing the extracted files and run:

```
> jupyter notebook
```

Setup

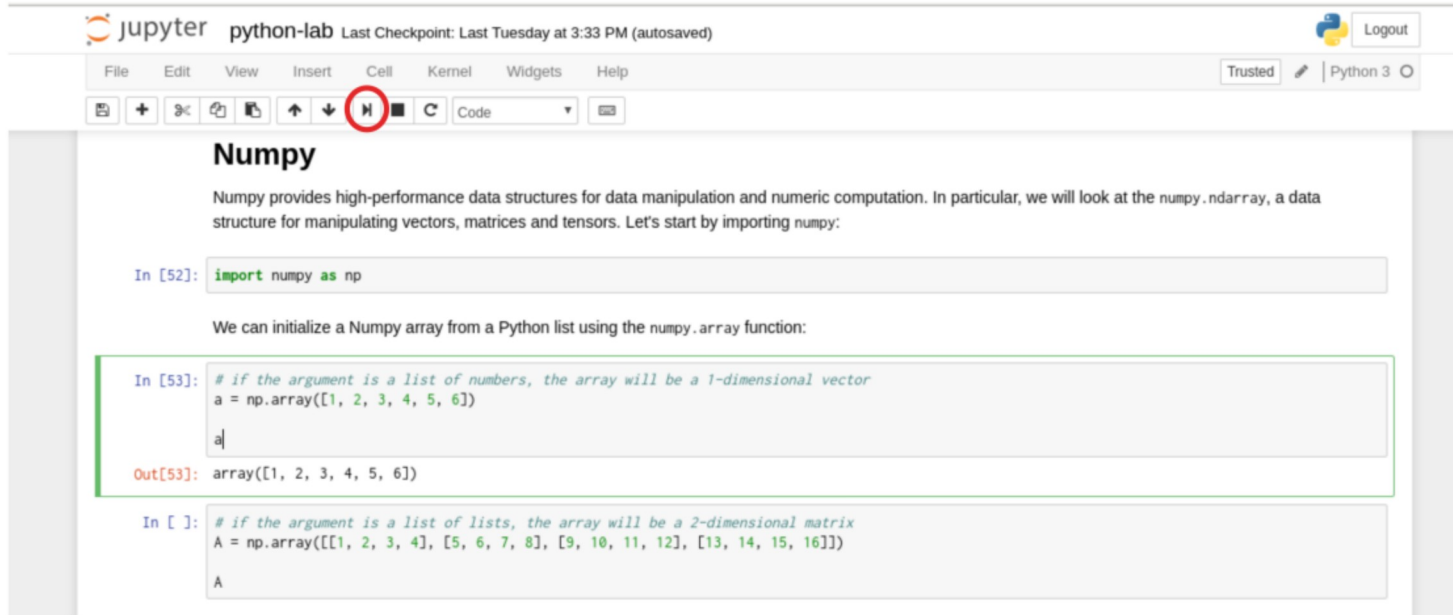
Jupyter notebook

Open the browser at the given address and you'll see something like:



Open the `sklearn-lab.ipynb` file containing the lecture notebook.

Jupyter notebook



The screenshot shows a Jupyter Notebook interface. At the top, the header bar includes the Jupyter logo, the text "python-lab", and a status message "Last Checkpoint: Last Tuesday at 3:33 PM (autosaved)". On the right of the header is a "Logout" button. Below the header is a menu bar with options: File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. To the right of the menu bar is a "Trusted" status indicator and a "Python 3" kernel selector. Below the menu bar is a toolbar with various icons. The "Run" button, which is a play icon, is circled in red. The main content area of the notebook is titled "Numpy". It contains a paragraph explaining that Numpy provides high-performance data structures for data manipulation and numeric computation, specifically mentioning `numpy.ndarray`. Below this paragraph is a code cell with the input `In [52]: import numpy as np`. This is followed by a text block stating: "We can initialize a Numpy array from a Python list using the `numpy.array` function:". Below this is another code cell with the input `In [53]: # if the argument is a list of numbers, the array will be a 1-dimensional vector` followed by `a = np.array([1, 2, 3, 4, 5, 6])` and a cursor. The output of this cell is `Out[53]: array([1, 2, 3, 4, 5, 6])`. Below that is a third code cell with the input `In []: # if the argument is a list of lists, the array will be a 2-dimensional matrix` followed by `A = np.array([[1, 2, 3, 4], [5, 6, 7, 8], [9, 10, 11, 12], [13, 14, 15, 16]])` and a cursor.

Execute commands by selecting a cell and clicking the **Run button** on the header of the page or by **Shift+Enter**. You will see the output of the command just below the cell.

You can tweak and modify the code as you wish and execute it again.