

Computational Intelligence module: Tutorials

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If this is your first time you will work on Python or any other programming language don't panic, it's totally fine. Although this course is using machine learning tools that have been pre-developed and are controlled with this programming language, you just need to acquire some basic familiarization. This small guide will help you to install all necessary tools on your system and then learn the very basics of programming.

1. Installation instructions

Please follow these steps in order to install the python tools we'll be using in your system.

1.1 Install Python 3.6 (via Anaconda) in your personal computer.

To do so, follow this link <https://www.anaconda.com/download/>, download and run the installer. Luckily, it works for all operating systems.

1.2 Create an environment in Anaconda.

By running Anaconda Navigator, you can see an overview of the libraries and environments installed in your computer. By default, Anaconda will have an environment called base (root). Navigate to the tab 'Environments' and click 'Create'. Give any name you like, for example *rc_course* and make sure that the python 3.6 checkbox is selected. Then press create.

1.3 Install python packages inside Anaconda's environment.

Now we want to go to a terminal and try to activate our brand new environment *rc_course*. On linux and Apple computers open a terminal, on windows computers open the second application that has been installed as part of the Anaconda suite, called 'Anaconda Prompt'. In both cases you should be looking at a terminal.

To make sure that Anaconda commands are visible by this terminal, type:

```
conda -version
```

If everything works you should get the message:

```
conda 4.4.10
```

(or a similar version). Now type

```
conda activate rc_course
```

where `rc_course` can be replaced with the name you chose for your environment. Now you are inside this virtual environment where you can install or remove features without harming the rest of your system. Finally, type:

```
pip install numpy matplotlib scipy sklearn tensorflow keras
```

This will take a few minutes but after this step you have kind of everything installed in your system so be patient

Note: If your computer has a good NVIDIA graphics card you might be able to use it to run tensorflow with GPU support. For more details on how to install tensorflow for GPU (as opposed to CPU) see here: <https://www.tensorflow.org/install/>

1.4 Install python packages inside Anaconda's environment.

To start a Jupyter session, type

```
jupyter notebook
```

in the same terminal we've been using throughout this tutorial. Jupyter should automatically open a new tab in your webbrowser showing your filesystem. Navigate to the file you would like to open or select **new > Python 3** to start a new notebook.

2. Familiarize yourself with Python and Jupyter

Jupyter provides a great platform to learn Python and it has been widely used by the online community. We recommend that you follow the tutorial in this link but any other tutorial you might have found and covers the same topic is absolutely fine.

2.1 Tutorial for basic Python, numpy, matplotlib.pyplot and scipy.

<http://cs231n.github.io/python-numpy-tutorial/>

Please try to follow the whole tutorial. If some parts are unclear or not enough, we have included further links of more in-depth tutorials. This webpage contains Jupyter notebooks for all the above sections which can be downloaded and ran if needed.

2.2 Tutorial for basic Python:

<https://github.com/rajathkmp/Python-Lectures>

Ideally, you should follow sections 1-7 in the table of contents. If this is your first time you are facing the world of programming, try to follow sections 1-6 (avoid classes). If this is still too difficult, please follow another simpler tutorial online or email the organizers of the course.

As before, this webpage contains Jupyter notebooks for all the above sections which can be downloaded and ran if needed.

2.3 Tutorial on matplotlib.pyplot, the basic library for making plots in Python

https://matplotlib.org/users/pyplot_tutorial.html