

# Setup for Bioinformatics LABS

Hi guys! Welcome to the labs of the Bioinformatics course!

In the next labs we will see some practical applications in Bioinformatics and to do so we will use Python as a programming language.

Some operating systems allow you to use Python in an immediate way (see Linux distributions) while with other operating systems (Windows among all) the set up can be a bit more complex.

If you have already programmed in Python in the past and already have a Python interpreter, you can continue to use it, otherwise we strongly recommend using Anaconda distribution which is cross-platform and offers support to a lot of useful packages.

## Steps to setup your environment for Windows, Linux and MacOS

1. Download and install Anaconda distribution according to your Operating System from here <https://www.anaconda.com/distribution/>
  - Click on the icon of your OS and select the installer for Python 3.7 version
  - After download, execute the installer with all default options
2. Run Anaconda-Navigator that should be correctly installed on your machine from the previous step
3. In order to have a clean environment to work in, we highly recommend creating a **new virtual environment**.
  - From the **environment** tab click on **Create** (plus icon)
  - Insert a name for the environment (e.g. Bioinfo\_labs). From packages select **Python 3.5** and unselect R.
  - Click on create
  - Wait until new environment is created
4. Install **additional packages and Python IDE** (here we will use Spyder, but if you are more comfortable with a text editor-e.g. Sublime Text- or another IDE-e.g. Pycharm- feel free to use them).
  - Select Bioinfo\_labs environment and in the **packages** tab select **All** (instead of Installed)
  - Search for **Spyder**, select it and click onto **apply**. Anaconda will solve all the dependencies you need to install the selected package, all you need to do is click on Apply button again.
5. How to install **additional packages**?

Packages can be installed using the graphical interface or from the command line. Whichever method you choose, **remember to activate and work on the correct virtual environment!!**

  - **Graphical interface:** Select Bioinfo\_labs environment and in the packages tab select All (instead of Installed). Then, search for the package you are looking for, select it and click onto apply.
  - **Command line:** from Anaconda Prompt for Windows users or from terminal for Linux/MacOS users type

```
conda activate Bioinfo_labs (or source activate Bioinfo_labs)
conda install package_name
```

For now, you don't need additional packages and you can **start practicing with Python right now!!** We will tell you the names of the packages as we need them during the following labs.

### Bash shell for Windows users (only for Windows 10)

If you are a Windows user and want to experiment with a Bash Shell, you can download the **Ubuntu LTS** application from Microsoft store. Despite having many limitations, you can still use it for the course purposes.

In order to run some tools (e.g. aligners of lab 2) you need to install here conda. Open Ubuntu **LTS app** and download miniconda with this command:

```
wget https://repo.continuum.io/miniconda/Miniconda3-latest-Linux-x86_64.sh
```

Then type:

```
chmod +x Miniconda3-latest-Linux-x86_64.sh
```

```
./Miniconda3-latest-Linux-x86_64.sh
```

Create your Bioinfo\_labs virtualenv and activate it:

```
conda create --name Bioinfo_labs python=3.5
```

```
conda activate Bioinfo_labs
```

**NOTE:** this application is not available for versions of Windows prior to Windows 10. In this case, **contact us to provide you alternative tools.**

Free online Jupiter notebook (simply in you want to practice Python programming language right away – no installation required)

**NOTE:** Although with this tool you cannot perform some tasks we will see during the LABs, it is extremely helpful!

Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud. With Colaboratory you can write and execute code, save and share your analyses, and access powerful computing resources, all for free from your browser. You can find it here:

<https://colab.research.google.com/notebooks/welcome.ipynb>