

Installation Guide for Anaconda and Jupyter

Contents

1	Introduction	1
2	Installing Anaconda distribution on Windows	1
3	Installing an additional required package	8

1 Introduction

This document briefly describes the installation procedure of Jupyter. In order to make the process easier, we take advantage of the Anaconda, a distribution of the Python and R programming languages for scientific computing applications, which comes with more than 1,500 packages as well as the conda package manager and Anaconda Navigator as a graphical alternative to the command-line interface.

The main Anaconda distribution requires a relatively huge amount of disk space (around 2 GB) but is very easy to install and use. An alternative approach to save disk space is using Miniconda, which is a minimal installer for conda and includes only conda, Python, the packages they depend on, and a small number of other useful packages. Therefore, some post-installation steps are required to be performed to make ready for scientific computing Jupyter notebooks.

If you have enough disk space and are not interested in command-line tools, go for a full Anaconda installation. Otherwise, in other cases, especially when you want to have full control over the installed packages and configuration, you may give Miniconda a try!

2 Installing Anaconda distribution on Windows

Before going for the installation, copy the provided content (unzipped content folder) to your Desktop or Documents folder. This makes it easier to locate it from the Jupyter notebook.

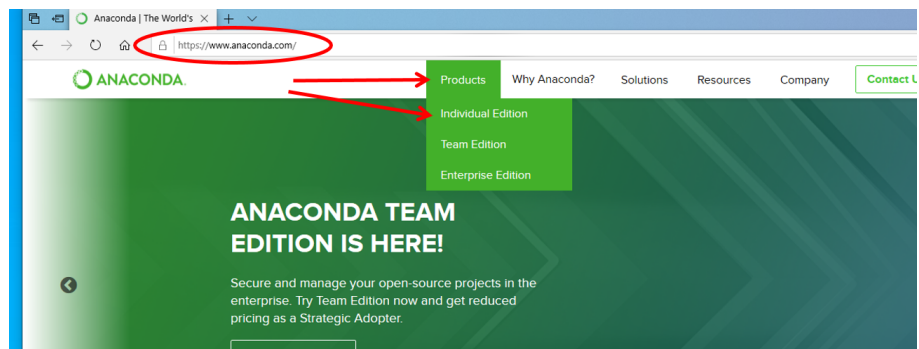


Figure 1:

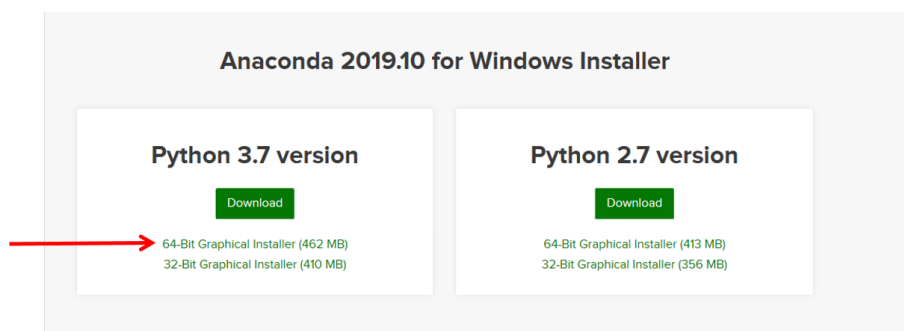


Figure 2:

Anaconda is available for different platforms and architectures and can be downloaded from <https://www.anaconda.com/>. On the top menu, click on "Products" and then "Individual Edition" (Fig. 1)

On the next page, you may find different versions of Anaconda. Scroll down a little bit and select the appropriate version based on your operating system (Windows in case) and CPU architecture (which is 99% a 64-bit processor). We use Python 3.7 because the previous version (2.7) is obsolete and not supported by the community. Generally, it is a good practice to work with Python version 3.x rather than version 2.7. Click on the link to start downloading the installer (Fig. 2).

After the download was completed, run the installer (without the administrative access because it is not required) and press "Next" to continue. In the "Installation Type" screen, select "Just Me" (Fig. 3).

Regarding the installation location (Fig. 4), make sure that the default selected location is inside your user profile (most of the times you can just leave the selected location as is).

"Advanced Options" step allows you to add Anaconda to your PATH variable. It literally means that you can run conda, Python, and Jupyter notebooks from the

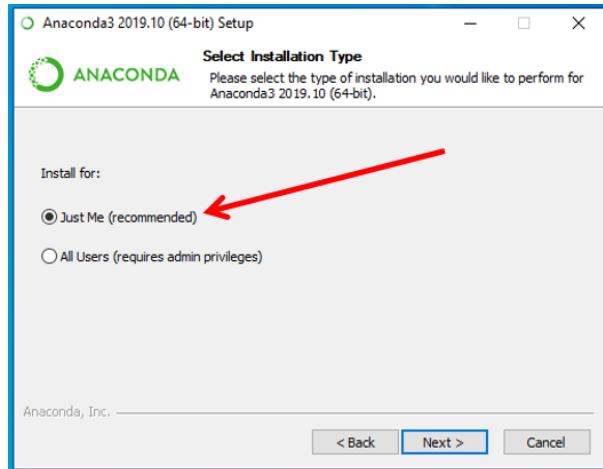


Figure 3:

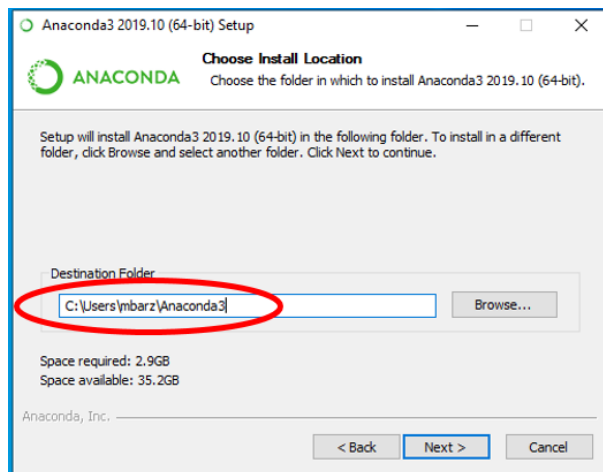


Figure 4:

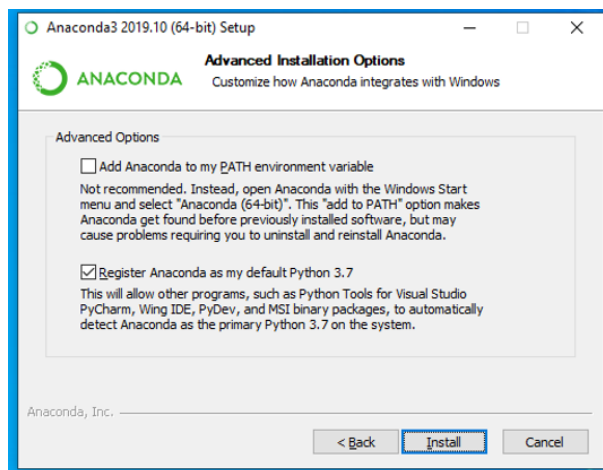


Figure 5:

Windows command-line. If this is not important to you, you can leave the screen as is (as we do) and continue the installation (Fig. 5).

Note for KU Leuven managed computers: If you are installing this software on KU Leuven managed computers such as a KU Leuven staff laptop or KU Leuven PCs, you should follow some extra steps due to new security policies. In this case, before starting the installation process, the downloaded installation file should be moved to C:\WorkDir\Programs and then executed. The installation location (Fig. 4) should be also C:\WorkDir\Programs\Anaconda3.

The installation process takes several minutes to complete (5-10 minutes). After the installation, open the Start menu and type "anaconda", and then open appeared "Anaconda Navigator" program (Fig. 6). Anaconda Navigator makes it easy to manage packages, tools, and virtual environments (it doesn't matter if you don't know what these are all about at this stage).

On the main screen of Anaconda Navigator, click on the Launch button in the Jupyter Notebook tile (Fig. 7). You may be asked to identify the browser with which to open Jupyter Notebooks. If so, choose your preferred browser.

If everything goes well, you should see a list of contents for your user profile opened in your web browser (Fig. 8).

To test proper functionality of the installed Python kernel and packages, navigate to the Desktop (or Documents) folder where you have copied the provided content by clicking on the folder's name. Then, continue navigation to the "Content" folder. Click on the "Test Installation.ipynb" file (Fig. 9) to open it.

When the notebook was ready, open the *Cell* menu and click on the *Run All* item (Fig. 10). This will run all the cells on the notebook again, and if everything goes

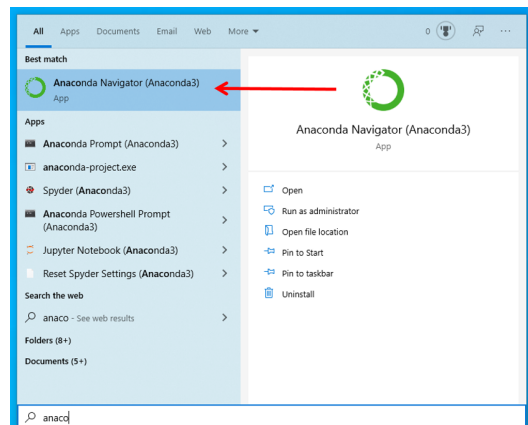


Figure 6:

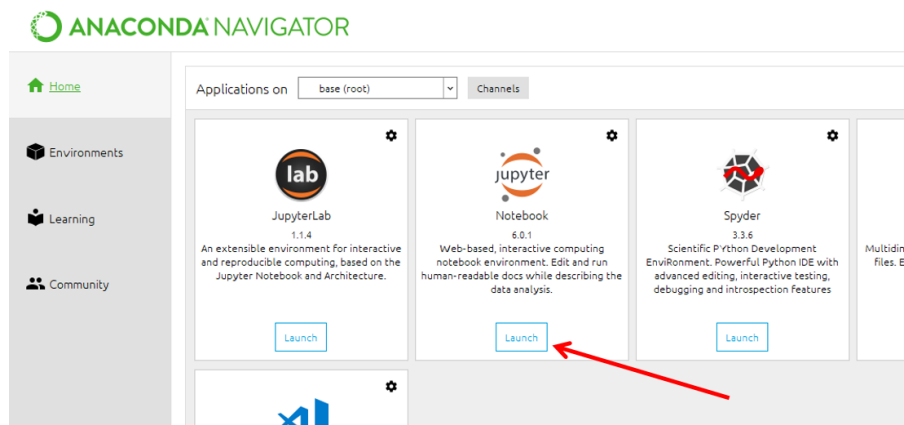


Figure 7:

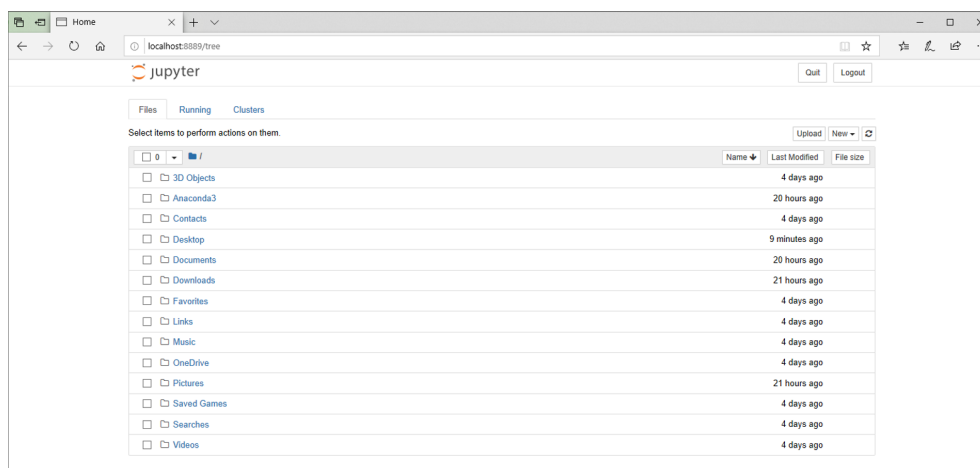


Figure 8:

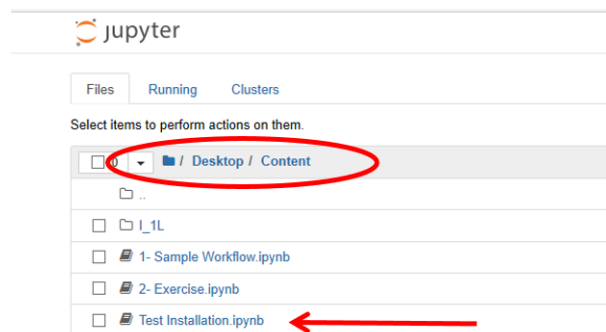


Figure 9:

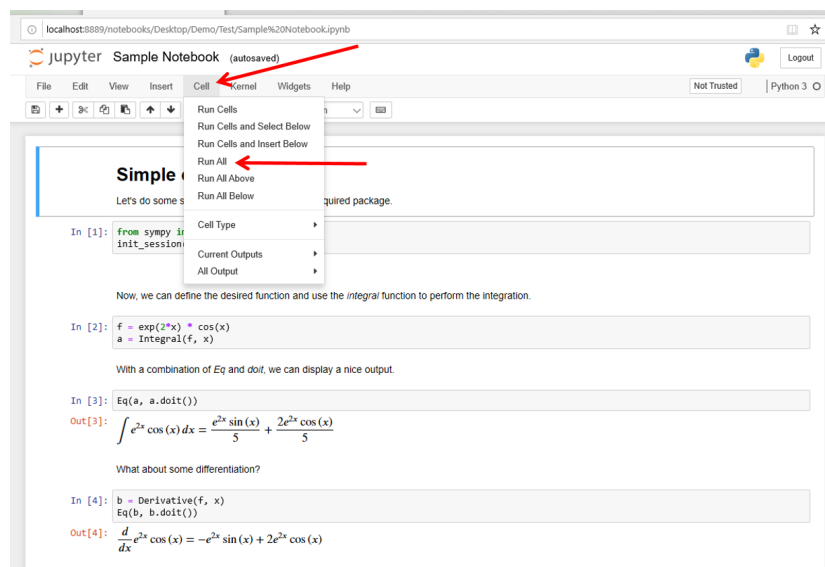


Figure 10:

well, you see that the output of the calculations appears again. At this moment, everything is ready for a journey into the Jupyter world.

To further evaluate the notebook, try to change the coefficient of the exponential term of the first computational cell. Then, execute the *Run All* command again from the *Cell* menu. You should see the new results computed for you (Fig. 11).

3 Installing an additional required package

In order to read and process CT images in Dicom format, we need to install PyDicom package as it is not distributed with Anaconda. To do this, in the main window of Anaconda Navigator, click the Environments, and then, click the small triangle

Now, we can define the desired function and use the *integral* function to perform the integration.

```
In [10]: f = exp(3*x) * cos(x)
a = Integral(f, x)
```

With a combination of *Eq* and *doit*, we can display a nice output.

```
In [11]: Eq(a, a.doit())
```

Out[11]: $\int e^{3x} \cos(x) dx = \frac{e^{3x} \sin(x)}{10} + \frac{3e^{3x} \cos(x)}{10}$

What about some differentiation?

```
In [12]: b = Derivative(f, x)
Eq(b, b.doit())
```

Out[12]: $\frac{d}{dx} e^{3x} \cos(x) = -e^{3x} \sin(x) + 3e^{3x} \cos(x)$

Figure 11:

in front of the base environment (as shown in Fig. 12). On the appeared menu, click "Open Terminal" to open the Windows command prompt.

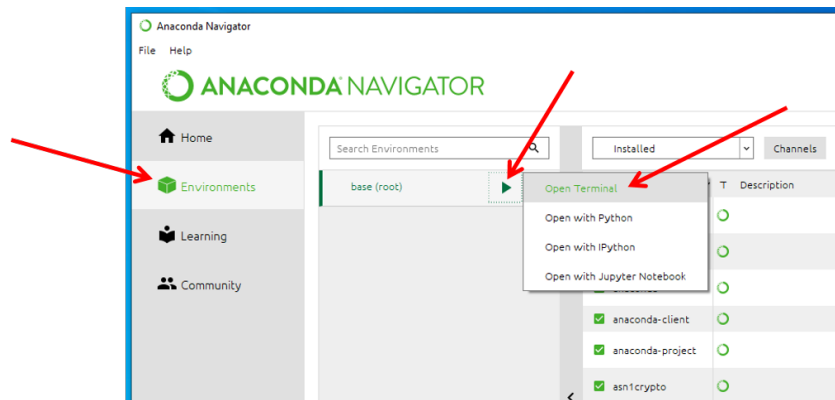


Figure 12:

In the command prompt type the following command and press enter:

```
pip install pydicom
```

If the installation goes well, you see the "Successfully installed" message printed on the terminal. After that, you can proceed to the sample workflow and the main exercise notebook.