



Iscte - IUL

Mestrado em Ciência de Dados

Instalar Python via Anaconda

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Summary

- Installation of Python using Anaconda
- Jupyter Notebook
- Spyder
- Install packages
- Some quick first steps

Python

- Python is a programming language: that is a way to tell a computer what you want it to do.
- Python is one of the world's most popular high-level programming languages.
- It is extremely versatile, and can be used in many real-world situations, teaching and research.
- Python has a simple and clear layout, less daunting for beginners.
- Python is an interpreted language: lines of code are executed one at a time.
- Each line of code is written as plain text.

```
score = 17  
total=20  
pct=score/total *100
```

Note about using and installing Python

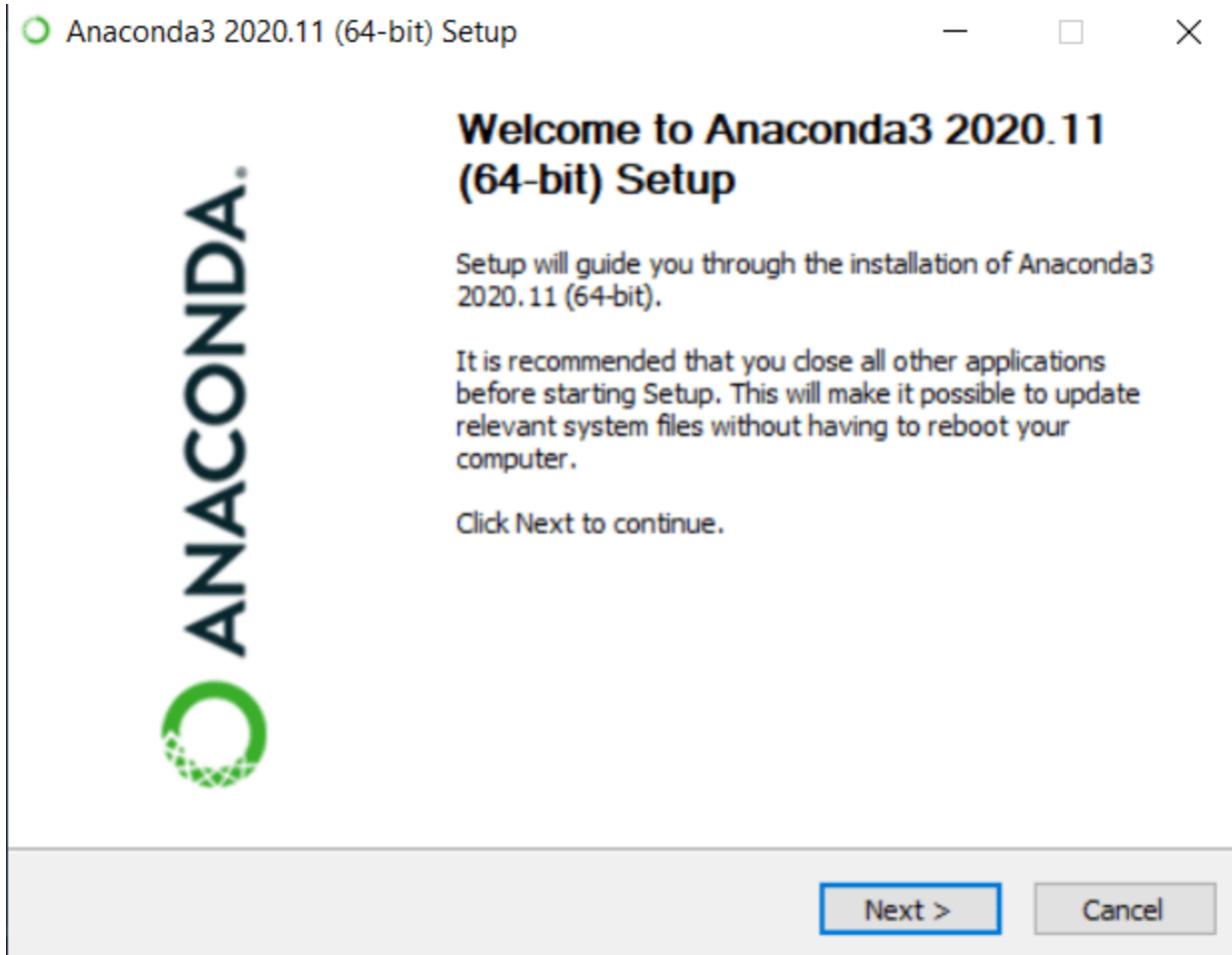
- *Anaconda* - you need to install (all in one)
- *Visual Studio Code* (VScode) - you need to install
- *PyCharm* - you need to install
- *Python* - you need to install
- *Google Colab* - **you do not need to install**
- *Kaggle Notebook* - **you do not need to install**

Installing Anaconda

1. Go to Anaconda org: <https://www.anaconda.com/>
2. Choose Download
3. Choose the operating system you have on your computer: Windows, macOS, or Linux
4. Choose Python 3.10 version
5. Start to install
 - i. Choose `Just me`
 - ii. Choose `Register Anaconda as my default Python 3.10`
 - iii. Finish installation ... takes quite some time
6. Next, you can `Launch` any of the Anaconda applications: we start with **Jupyter**

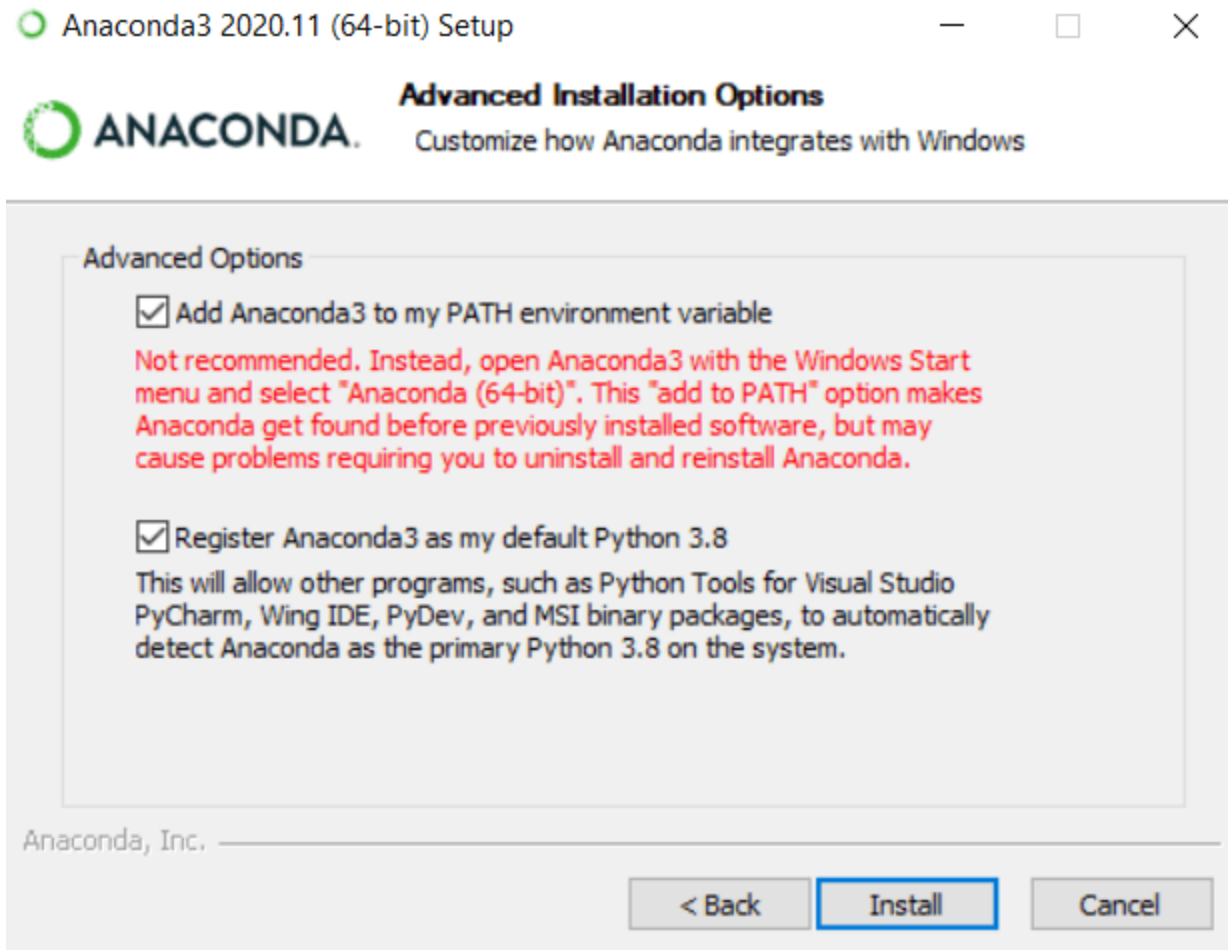
Installing Anaconda

- Run the installer. Click **Next>**.



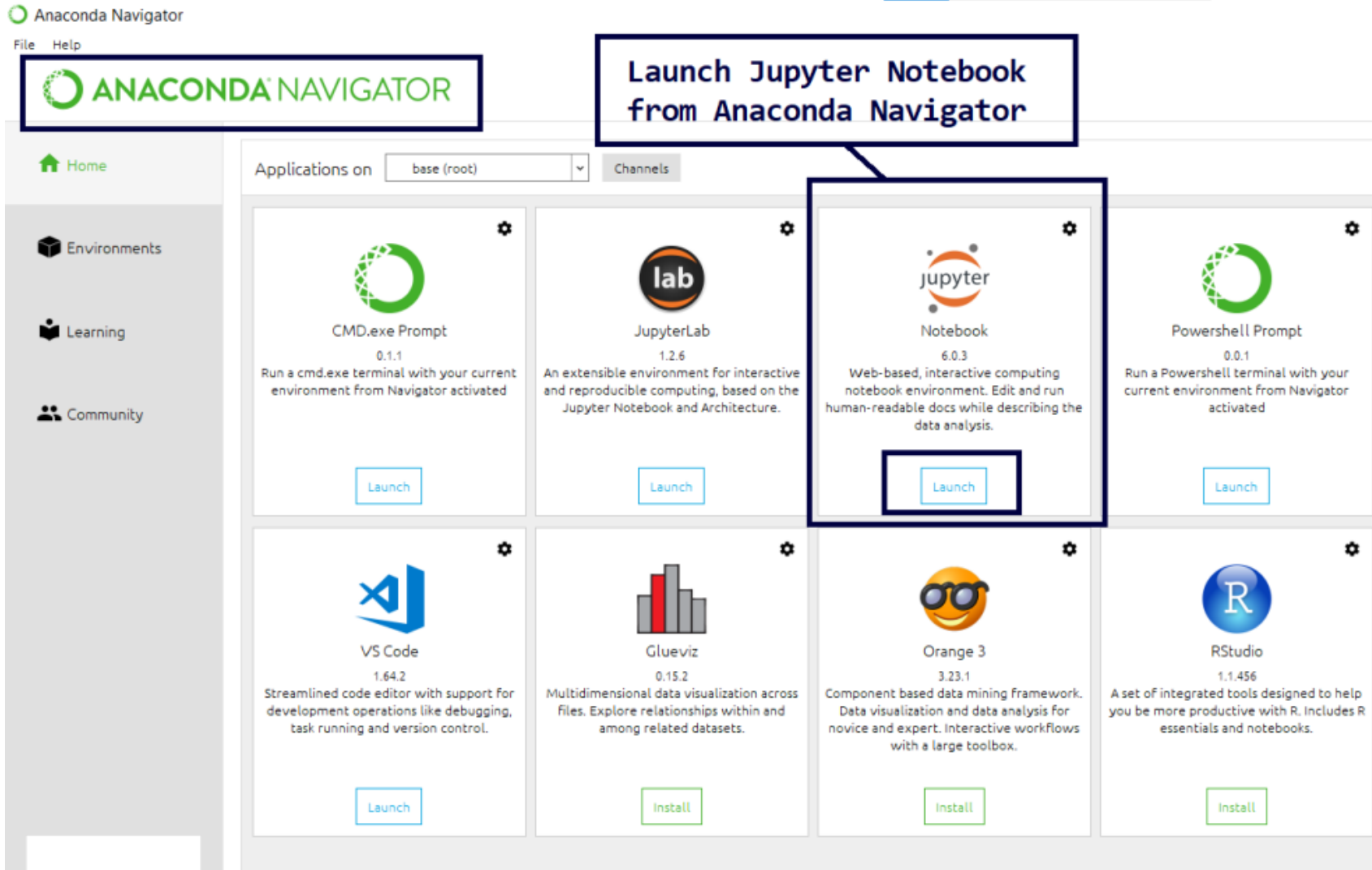
Installing Anaconda

- Make sure you have checked out **Add Anaconda3 to my PATH environment variable**. Click Install.



Jupyter Notebook

- Open Anaconda Navigator and Launch Jupyter Notebook



Jupyter Notebook

- Open a new Python notebook



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Python 3

Other:

Text File

Folder

Terminal

6 days ago 6.62 kB

| | | | |
|--------------------------|--|------------|---------|
| <input type="checkbox"/> | .. | | |
| <input type="checkbox"/> | first_try.ipynb | | 9 B |
| <input type="checkbox"/> | How to use Jupyter Notebook.ipynb | | kB |
| <input type="checkbox"/> | Python Variables, Data Types and Operators.ipynb | 6 days ago | 6.62 kB |

Jupyter Notebook

The image shows a Jupyter Notebook interface with several annotations. A blue box highlights the URL bar containing 'localhost:8888/notebooks/First-Notebook.ipynb'. Another blue box highlights the notebook title 'First-Notebook' and the status 'Last Checkpoint: 7 minutes ago (unsaved changes)'. The menu bar includes 'File', 'Edit', 'View', 'Insert', 'Cell', 'Kernel', 'Widgets', and 'Help'. The toolbar contains icons for saving, creating, deleting, and running cells, along with a dropdown menu set to 'Code'. The main content area features a Markdown cell with blue text: '## This is the first text cell' and '## You can add rich text, images, and more', followed by a link: '![do-what-is-great](https://images.unsplash.com/photo-1503437313881-503a91226402?ixlib=rb-1.2.1&ixid=MnwxMjA3fDB8MHxwaG90by1wYWdlFHx8fGVufDB8fHx8&auto=format&fit=crop&w=1032&q=80)'. Below the Markdown cell is a Code cell containing the Python code: 'In []: str1 = "Learn Python"', 'str1.upper()'. A blue box highlights the code cell, with a label 'Code cell' pointing to it. Another blue box highlights the Markdown cell, with a label 'Markdown cell' pointing to it.

localhost:8888/notebooks/First-Notebook.ipynb

jupyter First-Notebook Last Checkpoint: 7 minutes ago (unsaved changes)

File Edit View Insert Cell Kernel Widgets Help

Run Code

This is the first text cell

You can add rich text, images, and more


![do-what-is-great](https://images.unsplash.com/photo-1503437313881-503a91226402?ixlib=rb-1.2.1&ixid=MnwxMjA3fDB8MHxwaG90by1wYWdlFHx8fGVufDB8fHx8&auto=format&fit=crop&w=1032&q=80)

In []: str1 = "Learn Python"
str1.upper()

Code cell

Markdown cell

Jupyter Notebook

- To run a cell, press the Run [] button.
- Or you could use `Shift + Enter` to run a cell.
- The headings and images are rendered after running the cells.
- Jupyter Notebook is an interactive browser-based platform for scientific computing.
- It's an open-source flagship product of Project Jupyter and is widely used in data science.

Jupyter Notebook and Spyder

- Jupyter stands for Ju(lia)Pyt(hon)R
- Jupyter Notebook: *Text + Maths + Code + Computational results* (open in some Browser)
- **Spyder**: the Anaconda IDE (Integrated Development Environment) to write down programs in Python, run them, and get the results (with symbols, numbers, or figures)
- **Jupyter Notebook** file has the extension `.ipynb`
- **Spyder** file has the extension `.py`

Jupyter Notebook

- Insert code (input) into the cell (grey box)
- Cells are numbered by execution sequence
- Output showed below the code cell (with the same numbering)
- Busy cells show an asterisk sign to signify that the code is still being evaluated
- The blue bar signifies which cell is selected

```
[1]: 3+7+9
```

```
[1]: 19
```

```
[2]: "Hello " + "World"
```

```
[2]: 'Hello World'
```

```
[*]: import time  
time.sleep(10)  
print("Done sleeping")
```

Jupyter Notebook

- Jupyter Notebook uses **Markdown** for the text formatting.
- **Markdown** is a minimal language for formatting text.

```
# What's in the name?

## Jupyter

[Jupyter](jupyter.org) is named after
**Ju**lia, **Pyt**hon, and **R**
which are the *pillars* of modern
scientific programming.

Jupyter is used by
- Google
- NASA
- Many Others!
```

What's in the name?

Jupyter

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Spyder

- Main windows in Spyder: editor, console, variable explorer, plots

The screenshot displays the Spyder IDE interface with three main windows visible:

- Editor:** Shows the `plugin.py` file with Python code for a Spyder plugin. The code includes imports, class definitions, and methods for managing the plugin's interface and data.
- Variable Explorer:** Displays a table of variables in the current environment. The table has columns for Name, Type, Size, and Value.
- Plots:** Shows two plots: a 3D surface plot of a terrain model and a polar plot of a signal.

The Variable Explorer table contains the following data:

| Name | Type | Size | Value |
|-----------------|-----------------|--------|---|
| bool | bool | 1 | True |
| data | Array of str128 | (3, 3) | ndarray object of numpy module |
| datetime_object | datetime | 1 | 2021-04-14 17:35:14.687085 |
| df | DataFrame | (2, 2) | Column names: Col1, Col2 |
| filename | str | 53 | /Users/Documents/spyder/spyder/tests/test_dont_use.py |
| li | list | 5 | ['abcd', 745, 2.23, 'efgh', 70.2] |
| myset | set | 3 | {'2', '1', '3'} |
| r | float | 1 | 6.46567886443 |
| t | tuple | 5 | ('abcd', 745, 2.23, 'efgh', 70.2) |
| tinylist | list | 2 | [123, 'efgh'] |
| x | float64 | 1 | 1.1235123099439 |

How to install a package in Python?

- Open a new cell in Jupyter Notebook and insert.

```
pip install name
```

- **name** will be substituted by the package/library name

```
pip install pandas
```

```
pip install plotly
```

```
pip install seaborn
```


How to install a package in Python?

- Use **Anaconda Prompt**
- Anaconda Prompt is a **black window** that you can use to:
 - i. Check what packages you have installed: type `conda list` and click Enter
 - ii. To install new packages. For example to install Plotly, type:
`conda install -c plotly plotly` and click Enter
 - iii. To uninstall packages. For example to uninstall Numpy, type:
`conda uninstall numpy` and click Enter
 - iv. Define a virtual environment

Relevant packages

- Data visualization and Plotting: *Plotly, Matplotlib, Seaborn*
- Data objects and symbolic computation: *Numpy, Scipy*
- Statistics, modeling and machine learning: *StatsModels, Scikit-learn*
- Data structures and manipulation: *Pandas*
- Big Data: *Vaex*
- Performance modules: *Cython, Numba*

First Python Program

```
import time

# This is a comment - it can not be executed

print("Welcome to your first Python program.")

input("Press enter to exit the program.")

a=2
b=5
print(a+b)

print("Bye!")

time.sleep(2)
```

Bibliography

1. Paul Deitel, Harvey Deitel, (2020), *Intro to Python for Computer Science and Data Science: Learning to Program with AI, Big Data and the Cloud*, Pearson Education, Inc.
2. Al Sweigart, (2020), *Automate the boring stuff with Python: Practical Programming for Beginners* (2nd Edition), No Starch Press, Inc.