Data Science and Machine Learning for Engineering Applications

Python installation, Anaconda-Navigator, and Jupyter notebook: beginner's tutorial

March 8, 2023 - Politecnico di Torino

Introduction

This tutorial will show you how to: i) install Python with Anaconda-Navigator (Section 1); ii) manage virtual environments with Anaconda (Section 2); iii) install python packages (Section 3); iv) use Jupyter Notebook (Section 4).

1 Install Anaconda-Navigator

Anaconda Navigator is a desktop GUI (Graphical User Interface) allowing you to **launch applications** and **manage conda packages and environments** without command-line commands. It includes a GUI, Anaconda Navigator, as a graphical alternative to the command line interface. Navigator can search for packages, install them in an environment, run the packages, and update them. The Anaconda guide can be found at the following URL: https://docs.anaconda.com/anaconda/user-guide/getting-started/.

1.1 Download Anaconda-Navigator

From the Anaconda website at the following URL: https://www.anaconda.com/products/distribution, download the installation files for your operating system (i.e., MacOS, Linux, or Windows). Install the latest version of python with Anconda-Navigator. In this case, python 3.9.



1.2 Install Anaconda-Navigator

When the download is finished, double-click on the downloaded file in the bottom left-hand corner of your browser. This will start the installation of Anaconda-Navigator. The installation process depends on your operating system.

Start coding immediately Introducing Anaconda Notebooks + Learning Master the foundations of data science and spin up awesome data science anytime, anywherel Expert-led tutoriats. Cloud-hosted notebooks. Take yo the cloud today. Ty for free Subscribe	e projects bur work to
	Just getting started? Learn Python basics in 3 hours
1 2 class Roon: 3 def teach(self, students): 5 inport pythonanywhere	After a few hours with Anaconda's experts, you will: • Know how to read and write Python code

2 Create a virtual environment with Anaconda-Navigator

Python requires a different version for different kinds of applications. The application needs to run on a specific language version because it requires certain dependencies that are present in older versions but change in newer versions. Virtual environments make it easy to separate different applications and avoid problems with different dependencies [4]. Multiple ways of creating an environment include virtualenv, venv, and conda. However, the conda command is the preferred interface for managing installations and virtual environments with the Anaconda Python distribution.

This section shows how to create a virtual environment with Anaconda-Navigator, by exploiting the GUI (without the command line). If you want to learn more about creating a virtual environment with conda entirely with the command line, you can read more on this URL: https://towardsdatascience.com/manage-your-python-virtual-environment-with-conda-a0d2934d5195. This last option can be useful to run complex python projects on a remote server where the GUI is not available. However, it is not required for this course.

2.1 Select the environments

Click on the "Environments" button from the left menu. It will show the list of all your environments.

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2.2 Create a virtual environment

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2.3 Choose a new name for your virtual environment

You have to specify the **environment name** and the **Python version**. Then, click the "Create" button.

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2.4 Check the installed packages

Once created a new environment, the list of all **installed packages** in that environment will be shown. Notice that some packages are already installed.

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3 Packages

To install a new package in the virtual environment, you have two options:

- Using the Anaconda-Navigator GUI directly (Section 3.1).
- Using the **command line** with the **conda** or **pip** commands (Section 3.2).

The main difference between **conda** and the **pip** package manager is how the package dependencies are managed. When **pip** installs a package, it also automatically installs any dependent Python packages without checking if these conflict with previously installed packages. Therefore, it will install a package and any of its dependencies regardless of the state of the existing installation. In contrast, **conda** analyzes the current environment, including everything currently installed and any version limitations specified. It works out how to install a compatible set of dependencies and shows a warning if this cannot be done [5]. Using the **Anaconda-Navigator GUI** to install a package will exploit the **conda** package manager. You can learn more about the differences between **conda** and **pip** at the following URL: https://www.anaconda.com/blog/understanding-conda-and-pip.

3.1 Install a package with the navigator GUI

Installing any package through **Anaconda-Navigator GUI** is straightforward. You have to search for the required package, select a package, and click on "Apply" to install it

3.1.1 Search the required package

Select the option "Not Installed" in the top-center menu.

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Then search for the package that you want to install by typing the name in the textbox (e.g., in this case, NLTK).

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3.1.2 Select and install the required package

The Anaconda-Navigator will search in the conda repository for all the conda packages matching the typed name. Then, select the wanted package line and click on the "Apply" button in the right-hand bottom corner.

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It will open a new window with all the **dependencies** for that package. The **conda package manager** will install **all** the dependencies for you. Click the "Apply" button to start the package installation.

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Wait for the download and installation. It could take some minutes.

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3.1.3 Check the installed package

You can check if the package has been correctly installed by selecting the "Installed" selection in the drop-down menu.

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A new line corresponding to the installed package (in this case, NLTK) should appear.

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3.1.4 Uninstall the package

To uninstall a package, click the green \checkmark on the line corresponding to the package you want to remove.

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The green \checkmark will become a red crossed box. Then, click the "Apply" button in the right-hand bottom corner.

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It will open a new window with all the packages that will be **removed**. Finally, click the "Apply" button in the right-hand bottom corner to start the package uninstallation.

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3.2 Install a package with the command line

This Section will show you how to install packages by **terminal**, with the **pip** (Section 3.2.1) and **conda** (Section 3.2.2) commands. To open the **terminal** for your environment, select the corresponding line and click the green \triangleright symbol.

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Then, select the "Open Terminal" option.

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Benvironments	CS229-Stanford-Machine		ca-certificates	0	2023.0
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	XAI-ten-dim-env		🗹 libffi	0	3.4.2
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	cs224n		pip	0	22.3.*
	deep-learning-env		readline		8.2
	drift-lens-env	<	setuptools	0	65.6.3
	e-mimic-env		solite	0	3.40.
	inclusive-language-tool-env		🖬 tk	0	8.6.1
	mami-xai-env		2 4	0	0.38.4
	mids-env 🕨	Open T	erminal	0	5.2.10
A full Python IDE directly from the browser	nokia-xnlp-env	Open v	with Python	0	1.2.13
	ten-dim-erw	Open v	ith Jupyter Notebook		
vocumentation	torch-drift-env				
Anaconda Blog	warranties-project-erw				

This will open the **terminal** with the selected **environment activated** (i.e., if you install a package, it will be installed in the activated environment). You can see the **activated environment** in the round brackets at the left of the line (e.g., *mlds-env*).

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Last Login: Mon feb 20 12:16:19 on tryeBU //Warr/skiteseph/ofp/informoorg/BU/skiteste A& conds activate /Users/salesteeph/opt/amaconds}/Bu/skiteste A& conds activate /Users/salesteeph/opt/amaconds}/Bu/skitesteeph/opt/amaconds}/Bu/skitesteeph/opt/amaconds/B	ephd/opt/anaconds3/emvs/mlds-emv;

3.2.1 Install a package with the pip command

Some packages could **not** be available in the **conda environment**. You can find and install the package with another **package manager** like **pip**. To install a package with the **pip** command, type the command **pip install package-name**, in this case, NLTK. You can find the specific **pip** command for each package installation on the official documentation websites.

•••	🛅 salvatorephd — -zsh — 272×69
Last login: Mon Fe 20 2131:85 on ttys001 / Users/slvatcrephd/gcf/amcond3/sin/sct/vate && conda activate // / India-env) salvatorephd/MBPdisalvatore -% pip install nitu	Jsers/salvatorephd/opt/anaconds3/envs/mlds-env; conds3/bin/activate && conds activate /Users/salvatorephd/opt/anaconds3/envs/mlds-env;

Press enter on your keyboard to start the download and the installation. It could take some minutes



3.2.2 Install a package with the conda command

Instead, to install a package with the **conda** command, type the command **conda install package-name**, in this case, NLTK. You can find the specific **conda** command for each package installation on the official documentation websites.



The terminal will show all the **dependencies** (i.e., other packages) that will be installed. press **y** and then **enter** to start the download and the installation.



4 Jupyter notebook

Jupyter Notebook is a powerful tool for developing and presenting data science projects interactively. In a Jupyter Notebook document, you can combine code, visualizations, texts, and display outputs. You can find a good guide at the following URL [3]: https://www.dataquest.io/blog/ jupyter-notebook-tutorial/.

The following sections will show you how to: i) install Jupyter notebook using Anaconda (Section 4.1); ii) launch Jupyter from Anaconda 4.2; iii) create your first Jupyter notebook 4.3; iv) use cells and kernels to effectively exploit Jupyter notebooks (Sections 4.4 and 4.5); v) exploit advanced features of Jupyter notebooks (Section 4.6).

4.1 Install Jupyter

To install **Jupyter**, you must first go into the Home section, which contains all the applications for the current environment. Please check that the created virtual environment is selected (in this case, *mlds-env*).

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	NDA.NAVIGATOR				Upgrade Now	Sign in
A Home	Search Environments Q		Installed	Channels Update index. Search Parkage: Q.		
\square	base (root)		Name			Version
Environment	CS229-Stanford-Machine		ca-certificates	0		2023.0
	Image-EBAnO-env		🗹 certifi	0		2022.12.7
📫 Learning	T-EBAnO-env		Ubox	0		14.0.6
•• Community	XN-ten-dim-env		Ubffi	0		3.4.2
Community	alibi-detect-erw		ncurses			6.4
	concept-drift-env		opensa.			2224
	cs224n		python	0		22.3.1
	deep-learning-env		readline	0		8.2
	drift-lens-erw	<	🛃 setuptools	0		65.6.3
	e-mimic-env		🗹 sqlite	0		3.40.1
	inclusive-language-tool-env		🖬 tk	0		8.6.12
	mami-xai-erw		🗹 wheel	0		0.38.4
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A full Python IDE directly from the browser	nokia-xnlp-env		🖬 zlib	0		1.2.13
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Documentation	torch-drift-env					
Anaconda Blog	warranties-project-enw					
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	Create Clone Import Remove		15 packages available			

Then, click the "Install" button under the Jupyter application box.

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A Home	Applications on mlds-env	~ Channels					Refres
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Learning	Datalore	IBM Watson Studio Cloud	PyCharm Professional	Glueviz	JupyterLab	Notebook	
•			2021.3.3	1.2.4	3.5.3	6.5.2	
Community	Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.	IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models. using open source data science tools tools of the science tools of the science tools tools of the science tools of the science tools tools of the science tools of the science tools tools of the science tools tools of the science tools tools of the science tools tools of the science tools too	A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.	Multidimensional data visualization across files. Explore relationships within and among related datasets.	An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.	Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.	
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	Urange 3	Qt Console	RStudio	Spyder			
	3.52.0 Component: based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox.	5.4.0 PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calitips, and more.	1.1.456 A set of integrated tools designed to help you be more productive with R. includes R essentials and notebooks.	5.3.3 Scientific PYthon Development ErwiRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features			
	Install	install	Install	Install			
full Python IDE directly from the browser							
Documentation							
Anaconda Blog							

This will start the download and installation process. It may require some minutes.

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Environments	÷	, ŚŚ	°	, in a constant of the second	¢ lab	jupyter	
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•			2021.3.3	1.2.4	3.5.3	О	
Community	Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.	IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools.	A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL.	Multidimensional data visualization across files. Explore relationships within and among related datasets.	An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.	Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.	
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	Loading packages of /Users/salvatorephd/opt/	anaconda3/envs/mlds-env					

4.2 Launch Jupyter

After the installation, the Anaconda dashboard will show you the "Launch" button under the Jupyter Notebook box. Click on "Launch" to start Jupyter notebook.

Home	Applications on mlds-env	~ Channels					R
Environments	÷	*	¢	¢	· ·	¢	
Learning	Datalore	IBM Watson Studio Cloud	Notebook	PyCharm Professional	Glueviz	JupyterLab	
,			652	2021.3.3	1.2.4	3.5.3	
Community	Online Data Analysis Tool with smart coding assistance by JetBrains. Edit and run your Python notebooks in the cloud and share them with your team.	IBM Watson Studio Cloud provides you the tools to analyze and visualize data, to cleanse and shape data, to create and train machine learning models. Prepare data and build models, using open source data science tools	Web-based, interactive computing notebook environment. Edit and run human readable docs while describing throug analysis.	A full-fledged IDE by JetBrains for both Scientific and Web Python development. Supports HTML, JS, and SQL	Multidimensional data visualization across files. Explore relationships within and among related datasets.	An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.	
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	3.32.0 Component: based data mining framework. Data visualization and data analysis for novice and expert. Interactive workflows with a large toolbox.	5.4.0 PyQt GUI that supports inline figures, proper multiline editing with syntax highlighting, graphical calltips, and more.	1.1.456 A set of integrated tools designed to help you be more productive with R. Includes R essentials and notebooks.	5.3.3 Scientific Pithon Development EnviRonment, Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features			
	Install	Install	Install	Install			
Python IDE directly om the browser							
Documentation							

It will open the **Notebook Dashboard** for **exploring**, **editing**, and **creating** notebooks. Here you can create new folders, notebooks, etc. The URL for the dashboard is *https://localhost:8888/tree*. Localhost is not a website but indicates that the content is run on your local machine.

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Select items to perform actions on them.	Upload New - 2
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Documents	18 giorni fa
Downloads	11 ore fa
Dropbox (Politecnico Di Torino Studenti)	10 giorni fa
C gensim-data	10 mesi fa
C Movies	2 anni fa
C Music	2 anni fa
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C D Notebooks	3 mesi fa
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C Pictures	2 anni fa
C Public	2 anni fa
Ci PycharmProjects	12 giorni fa

4.3 Create a new Jupyter notebook

To create your first Jupyter notebook click the "New" drop-down button in the top-right menu and select "Python 3". This will open your first Jupyter notebook in a new tab. You can **open** and **run multiple** notebooks simultaneously in multiple tabs.

• • • • C Home Page - Select or create : ×	+		~
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	□ 0 · ►/	Python 3 (ipykernel)	
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	C Movies	2 anni fa	
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	Copt	2 anni fa	
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It will create a new file Untitled.ipynb. Each .ipynb file is a text file that describes the contents of your notebook in a format called JSON. Each time you create a new notebook, a new .ipynb file will be created. Notice that the notebook extension .ipynb is different from the normal python file extension .py. Please rename now your filename from the top text box, or, very soon, you will have several Untitled.ipynb, Untitled (1).ipynb notebooks. The notebook's name should explain the content.

• • • C Home Page - Select or create : ×	e MyFirstJupyterNotebook - Jup x +				
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	File Edit View Insert Kernel Help	Trusted	Python 3 (pykernel) O	
	In []:				

4.3.1 The Jupyter Notebook interface

The two main concepts that you should learn to use notebooks properly are **cells** and **kernels**:

• The cell is a container for code to be executed or text to be displayed in the notebook by the kernel (Section 4.4).

• The kernel is a computational engine that executes the code contained in a notebook document (Section 4.5).

4.4 Notebook cells

Cells compose the body of the notebook. They could contain code, plain text, images, LaTeX, math formulas, etc. There are two main cell types that you should learn:

- Code cells (Section 4.4.1)
- Markdown cells (Section 4.4.2)

4.4.1 Code cell

Code cells contain code to be executed in the kernel. When the code is run, the notebook displays the output below the code cell that generated it. Note that cells do not have to be executed in order. It is also possible to execute a cell at the end and then one at the beginning of the notebook. The cell type is shown in the drop-down menu. The default type is **Code**.

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File Edit View Insert Cell Kernel Help B) + B 20 B) + → → → FRan B C → Cose ✓ Cell	Trusted	Python 3 (ipykernel) O	
In []: print("This is my first Jupyter motebook")			

You can run a **Code** cell by:

- clicking the "Run" button
- pressing ctr + enter
- pressing maiusc + enter (in this case, it also goes to the next cell)



In this case, the execution of the cell will print the string "This is my first Jupyter notebook" as output. Each cell could produce an output.

		10.1
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File Edit View Insert Cell Kernel Help	Trusted 🖋 Python 3 (ipykernel) O	
E + 3× 20 10 ↑ ↓ ► Run ■ C ➤ Code ✓ Code		
In (1): print("This is my fifst Jupyter notebook") This is my first Jupyter notebook In ():		

The following cell will create a new variable called x and assigns the values of 10 to x. In this case, no output is produced by the cell.

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File Edit View Insert Cell Kernel Help 10 + >	Trusted Python 3 (ipykernel) O
In [1]: print("This is my first Jupyter notebook") This is my first Jupyter notebook	

You should use the print function to output the value of x.

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File Edit View Insert Cell Kernel Help	Trusted 🖋 Python 3 (ipykernel) O
B + 3< Q B ↑ ↓ ▶ Run ■ C ≫ Code ∨ ■	
<pre>In [1]: print("This is my first Jupyter notebook")</pre>	
This is my first Jupyter notebook	
In [2]: x = 10	
In [3]: print(x)	
10	
In []:	

4.4.2 Markdown cell

Markdown cells contain text formatted using Markdown [2] and displays its output in-place when the Markdown cell is run. Markdown is a lightweight markup language that you can use to add formatting elements to plaintext text documents. This cheat sheet will cover the most common elements (cheatsheet). To define a Markdown cell, select the cell and click on the "Markdown" option in the top drop-down menu.

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In [1]	a print("This is my first Jupy a concentration of the second seco		
In (2)	rnis is ny first Jupyter notebook		
	NameError Traceback (most recent call last) Cell In[2], line 1 > 1 print(§)		
In [3]	NameError: name 'x' is not defined		
In (4)	print(x)		
In [5]	x = x+10		
In [6]	20 2		
In [8]	<pre>> ^ - ^</pre>		
In []	• •		

4.4.3 Text Markdown cell

You can write plaintext in a cell. This text is not a code. Therefore, it will not be really executed. You can also empathize text with **bold** or *italic* with ****bold**** and ***italic*** respectively.

Ş	🗲 Jupyter	MyFirstJupyterNotebook Last Checkpoint: 20/02/2023 (unsaved changes)	🥏	Logout
	File Edit	View Insert Cell Kernel Help	Not Trusted 🖋 Python 3 (ipyke	ernel) O
2	2 + × ଏ			
	In [2]:	NameTrror Traceback (most recent call last) Cell In(2), line 1> 1 print(\$) NameTrror: name 'x' is not defined		
	In [3]:	x = 10		
	In [4]:	print(x) 10		
	In [5]:	x = x+10		
	In [6]:	print(x) 20		
	In [7]:	x = x-1		
	In [8]:	print(x) 19		
([This is a text cell		
	In []:			

If you run the cell containing **plaintext**, it will be displayed formatted as output. This can add **narrative** to your Jupyter notebook.

💭 jupyte	MyFirstJupyterNotebook Last Checkpoint: 20/02/2023 (unsaved changes)	Pagout Logout
File Edit	View Insert Cell Kernel Help	Not Trusted Python 3 (ipykernel)
8 + %	2 1 1 + + + Run ■ C + Code - □	
In [2]	: print(x)	
	NameError Traceback (most recent call last) Cell In[2], line 1 > 1 print() NameError: name 'x' is not defined	
In [3]	: x = 10	
In [4]	: print(x)	
	10	
In [5]	$\mathbf{x} = \mathbf{x} + 10$	
In [6]	: print(x)	
	20	
In [7]	: x = x-1	
In [8]	: print(x)	
	19	
	This is a text cell	
In[]		

4.4.4 Heading Markdown cell

You can also add first, second, and third-level **headings**.

This is a text cell # This is a 1 level header cell
This is a text cell
This is a 1 level header cell ¶
This is a text cell
This is a 1 level header cell ## This is a 2 level header cell

This is a text cell
This is a 1 level header cell
This is a 2 level header cell
In []:

4.5 Notebook kernel

When you run a code cell, that code is executed within the **kernel**, and the **outputs** are returned to the cells to be **displayed**. The **kernel's state persists over time** between cells. It pertains to the document as a whole and not individual cells. For example, if you import libraries in one cell, they will be available in another. If you define the value of a variable in one cell, the variable's value also persists for the other cells.

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File Edit	View Insert Cell Kernel Help	Trusted 🖋 Python 3 (ipykernel) O
8 + %	2 🖪 🛧 ¥ ▶ Run 🔳 C 🕨 Code ✓ 🗃	
In [1]:	print("This is my first Jupyter notebook")	
	This is my first Jupyter notebook	
In [2]:	x = 10	
In [3]:	print(x)	
	10	
In (4):	x = x+10	
In (5):	print(x)	
	20	
In [6]:	x = x-1	
70.(7)	print/x)	
an (7).	19	
In []		

4.5.1 Restarting a kernel

If you **restart the kernel**, the **notebook's status is deleted**. After the kernel's restart, all the values of your variables are reset. To restart the kernel, click the "Kernel" button in the top menu. Then, select "Restart & Clear Output". This will restart your kernel and clear all the outputs in the cells. You can also select "Restart & Run All" to restart your kernel and run all cells in order.

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File E	t View Insert Cell Kernel Help < 22 K ★ ★ ▶ Pan Interrupt 3.3 ∨ □3	Trusted Python 3 (ipykernel) O
In	Restart © © Restart & Clear Output 1): print ("This is my first p This is my first p Reconnect	
In	1: print(x) 21: x = 10	
In	3]: print(x) 10	
In	4): x = x+10 5): print(x) 20	
In	6): [x = x-1 7): [print(x)	
In	19]1	

Jupyter MyFirstJupyterNotebook Last Checkpoint: 18 ore fa	(unsaved changes)	
File Edit View Insert Restart kernel and clear all output	Y susted Python 3 (pykernel) O	
B + 3× 20 K ↑ ↓ Do you want to restart the current kernel and c	lear all output? All variables and outputs will be lost.	
In [1]: print("This This is my first subvict notepoor	Continue Running Restart and Gierr Al Outputs	
In []: print(x)		
In [2]: x = 10		
In [3]: print(x) 10		
In [4]: x = x+10		
In [5]: print(x) 20		
In [6]: x = x-1		
In [7]: print(x) 19		
In []:		

Restarting the kernel clears all the cells' outputs and initializes the run identification number of each cell.

Jupyter MyFirstJupyterNotebook Last Checkpoint: 18 ore fa (autosaved)	e Logout
File Edit View Insert Cell Kernel Help	Trusted & Python 3 (ipykernel) O
In []: print("This is my first Jupyter notebook")]	
In []: print(x)	
In []: x = 10	
In []: print(x)	
In []: x = x+10	
In []: print(x)	
In []: x = x-1	
In []: print(x)	
In []:	

What do you think will happen if you now print the value of the variable x again? It will raise an error message because restarting the kernel caused a reset of the notebook status and, consequently, all the previously defined variables.

💭 Jupyte	MyFirstJupyterNotebook Last Checkpoint: 18 cre fa (unsaved changes)		nt Logout	
File Edit	View Insert Cell Kernel Help	Trusted	Python 3 (ipykernel) O	
In [1]	print("This is my first Jupyter notebook") This is my first Jupyter notebook			
In [2]	print(x)			
	NameError Traceback (most recent call last) Cell fn[2], line 1 > 1 print(a)			
	NameError: name 'x' is not defined			
In []	: x = 10			
In []	<pre>print(x)</pre>			
In []	x = x+10			
In []	<pre>print(x)</pre>			
In []	x = x-1			
In []	<pre>print(x)</pre>			
In []	۶ 			

Therefore, you should define x again to print its value.

image: provide MyFirstJupyterNotebook Last Checkpoint 16 ore 16 (unsaved changes) Image: provide MyFirstJupyter Notebook File Edit Vew Mail Hep Tracted Python 3 (pyterme) O Image: provide MyFirst Jupyter notebook Image: provide MyFirst Jupyter NyFirst Jupyter notebook Image: provide MyFirst Jupyter NyFirst Jupyter N				
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		In (1): print("This is my first Jupyter notebook") This is my first Jupyter notebook In (2): print(%) NewsBrror Cell In[2], lise 1 > 1 print(%) NewsBrror nom 'x' is not defined		
		<pre>In [4]: print(x) 10</pre>		
1n [4]: [print(x) 10		In []: x = x+10]
In [4]: print(x) 10 In []: x = x+10		<pre>In []: print(x)</pre>		
In [4]: print(x) 10 In []: x = x+10 In []: print(x)		In (): $x = x-1$		
<pre>In (4): print(x) 10 In (): x = x+10 In (): print(x) In (): x = x-1</pre>		In []: print(x)		
In [4]: print(x) 10 In []: x = x+10 In []: x = x-1 In []: print(x)		In []:		
In [4]: print(x) 10 In []: x = x+10 In []: x = x-1 In []: print(x) In []: print(x) In []: x = x-1				

4.6 Jupyter notebook advanced tips, tricks, and shortcuts

More advanced tips and commands such as keyboard shortcuts, pretty display, executing shell commands, using LaTeX could be found here [1] (https://www.dataquest.io/blog/jupyter-notebook-tips-tricks-shortcuts/)

References

- [1] Dataquest. 28 Jupyter notebook tips, tricks, and shortcuts. Feb. 2023. URL: https://www.dataquest. io/blog/jupyter-notebook-tips-tricks-shortcuts/.
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- [4] Set up virtual environment for python using anaconda. Apr. 2022. URL: https://www.geeksforgeeks. org/set-up-virtual-environment-for-python-using-anaconda/.
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