



NOVA

IMS

Information
Management
School

Programming for Data Science

Fall Semester

Introduction to Python

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- Tools:
 - Python
 - Anaconda
 - Jupyter Notebook
- Setting up your environment

Ground Rules of practical classes

- Each group has 2 practical classes per week (Practical + Lab).
- Each week, the practicals will focus on implementing the techniques covered in the theoretical classes
- **Attendance in the practical classes is not strictly mandatory to complete the course (but heavily recommended)**
- **Attend the schedules assigned to your group**

The practical component of the course will have an individual component (Labs) and a final group project.

Evaluation Labs (50%)

- At the start of the lab, you may be informed that you need to deliver it by the end of class (it can happen any week)
- 6 labs
- The best 5 (out of the 6) will be accounted for in this component

Group Project (40%)

- You will be provided with a repository containing the possible projects with varying levels of difficulty.
- You can select any project out of the options provided.
- Grading will take into account our perceived difficulty of the project you choose.
- More details later in the semester.

Disclaimers

- Participation in the Project is required even if you opt for non-continuous assessment.
- Continuous assessment requires participation in at least 4 evaluation labs.
- The minimum grade in the project and practical exercises is 8.00 (out of 20).

Tools - Python



Python is a programming language that lets you work quickly and integrate systems more effectively.

*Python is a widely used **high-level programming language for general-purpose programming**[...]*

Tools - Python



- Python language is one of the most popular tools for data science and analytics
- Easy to Read, Learn and Use
- Hundreds of Python Libraries and Frameworks
- Supportive Python Community
- **Support for Big data, Machine Learning and Data Mining**

Tools - Anaconda



ANACONDA®

- A very popular platform for Data Science
- Easy to install and use
- Provides easy access to many libraries often used for data manipulation and Machine Learning tasks

Tools – Jupyter Notebook



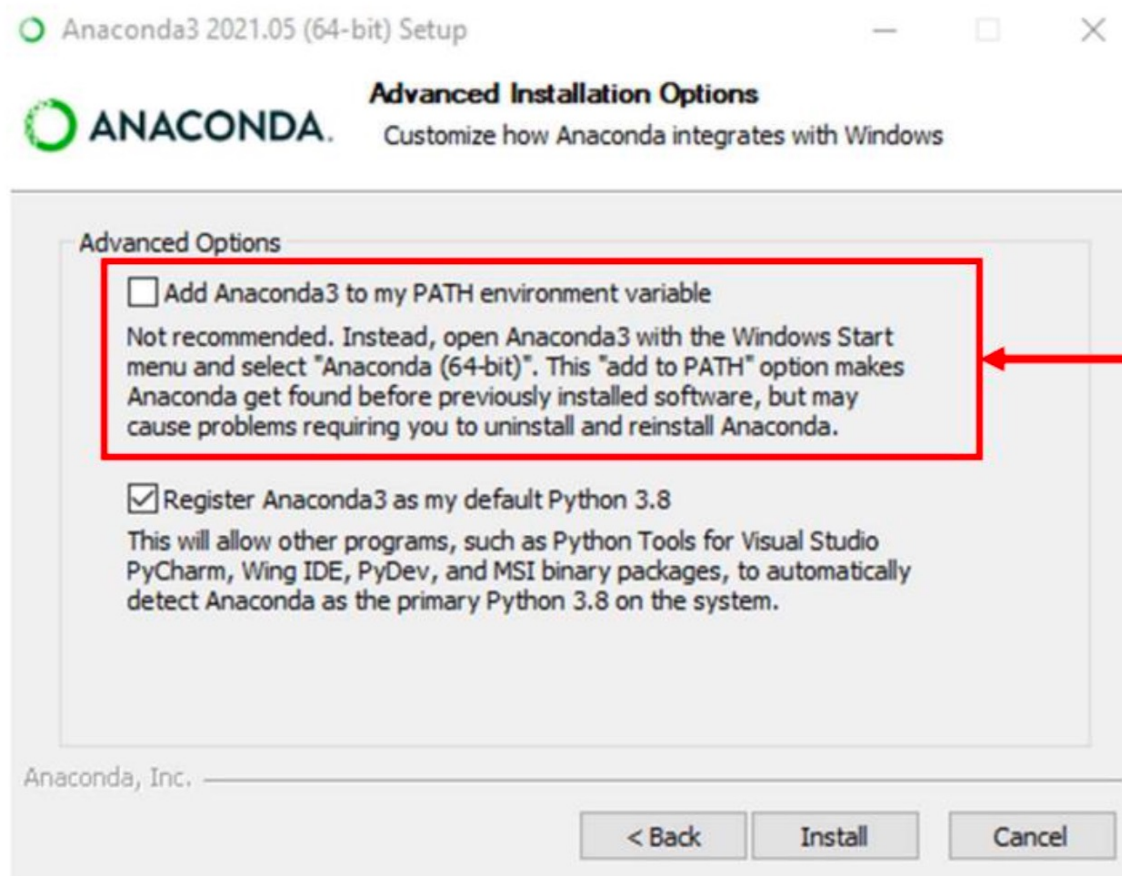
- A web-based interactive computing platform
- Cell-based structure, very convenient to test code
- Often adopted by cloud computing providers

Set up your environment

1. Installing Anaconda
2. Opening Jupyter Notebook

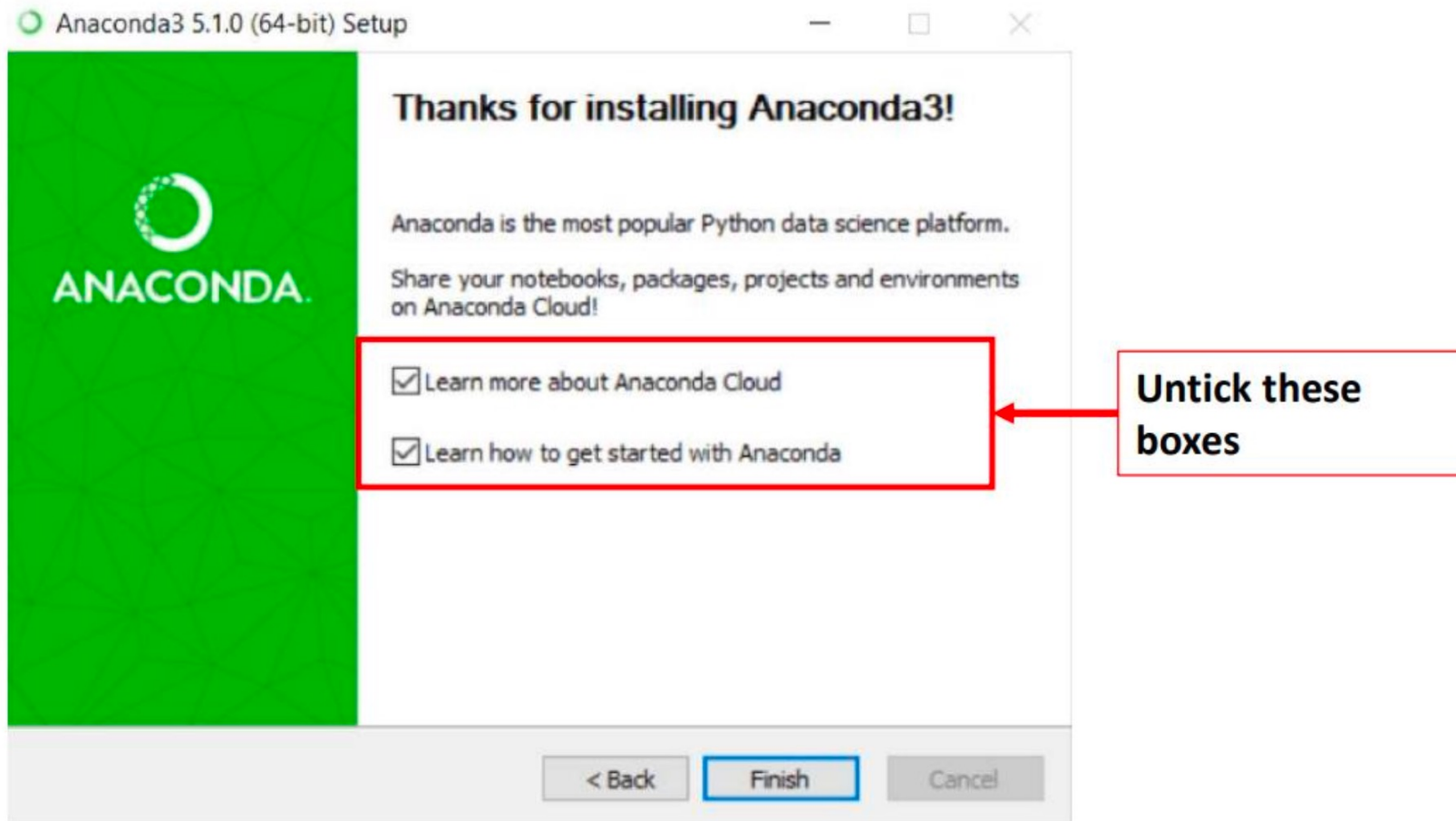
1. Installing Anaconda

1. Download and install Anaconda (<https://www.anaconda.com>)



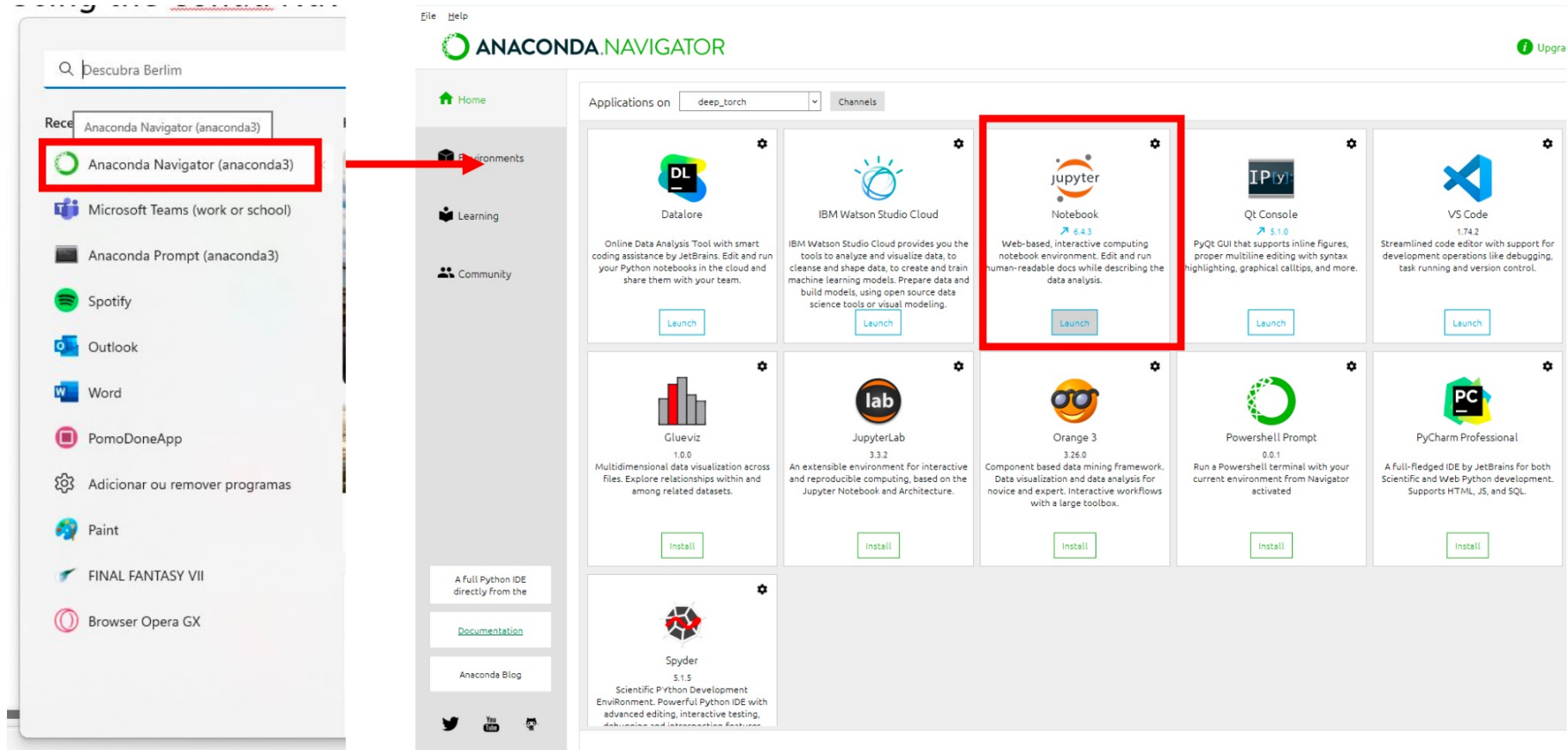
**Tick this box only
if you don't have
any version of
Python or
Anaconda in your
system**

1. Installing Anaconda



2. Opening Jupyter Notebook

a. Using the Anaconda Navigator

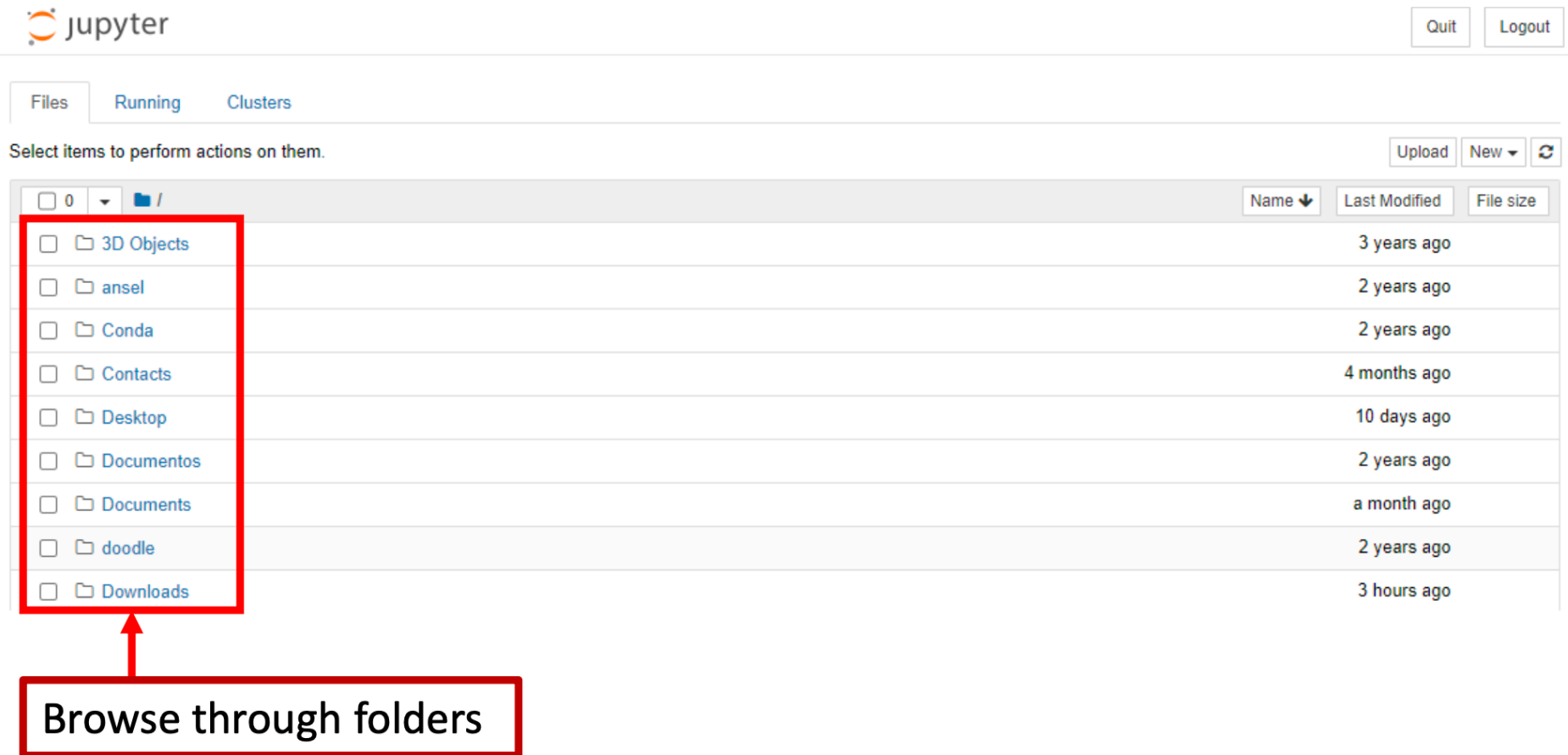


2. Opening Jupyter Notebook

b. Using the Anaconda Prompt



2. Opening Jupyter Notebook



The screenshot shows the Jupyter web interface. At the top, there's a 'jupyter' logo and 'Quit' and 'Logout' buttons. Below the logo are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' with 'Upload', 'New', and a refresh icon. The main area is a file browser with a table of folders. A red box highlights the folder list on the left, and a red arrow points from a text box below to it.

	Name ↓	Last Modified	File size
<input type="checkbox"/> 0	/		
<input type="checkbox"/>	3D Objects	3 years ago	
<input type="checkbox"/>	ansel	2 years ago	
<input type="checkbox"/>	Conda	2 years ago	
<input type="checkbox"/>	Contacts	4 months ago	
<input type="checkbox"/>	Desktop	10 days ago	
<input type="checkbox"/>	Documentos	2 years ago	
<input type="checkbox"/>	Documents	a month ago	
<input type="checkbox"/>	doodle	2 years ago	
<input type="checkbox"/>	Downloads	3 hours ago	

Browse through folders

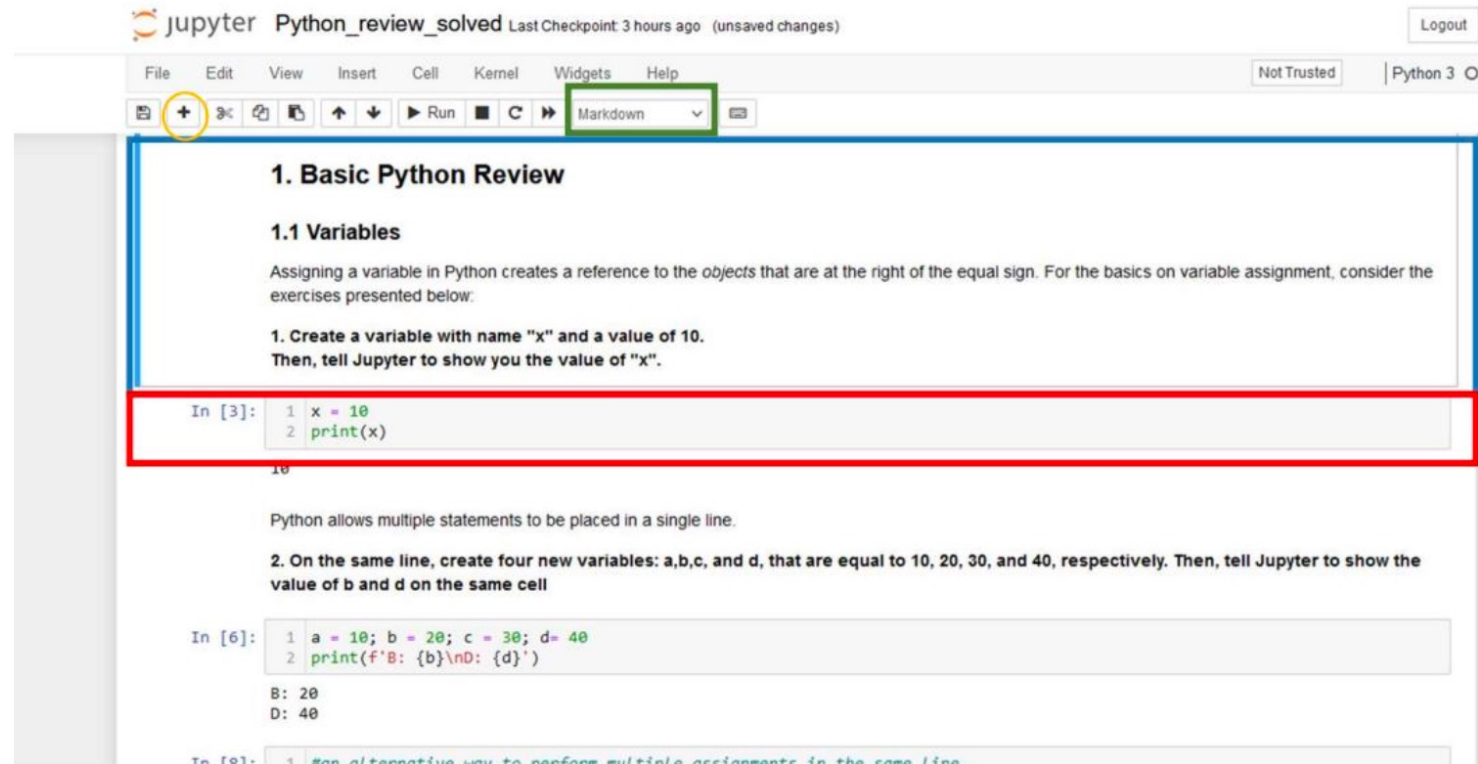
2. Opening Jupyter Notebook

The screenshot shows the Jupyter web interface. At the top, there's a 'jupyter' logo and 'Quit' and 'Logout' buttons. Below, there are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' Below this is a file browser showing a directory structure: '/ Documents / NOVA IMS / BSc LGI / ML / Semana 2 - Introduction to Python'. A list of files is shown, including 'Introduction to Python - Exercises - Solution.ipynb', 'Introduction to Python - Exercises.ipynb', 'Introduction to Python.ipynb' (highlighted with a red box), '22_23_Python Intro.pptx', and 'Class 1 - Introduction to Python.pdf'. To the right, there are 'Upload', 'New', and 'Refresh' buttons. A dropdown menu is open under 'New', showing options: 'Notebook: Python 3 (ipykernel)', 'Other: Text File' (highlighted with a red box), 'Folder', and 'Terminal'. Red arrows point from the highlighted file and the 'Text File' option to their respective labels below.

Option 1: Open existing ipynb file

Option 2: Create new ipynb file

3. Working with Jupyter Notebooks



- **Markdown cell**
- **Code cell**
- **Adds one cell below**
- **Switches between modes (Markdown/Code)**

4. Creating an Environment

Creating a new environment in Anaconda ensures **dependency isolation** and **avoids conflicts**, providing a clean and controlled workspace.

More information on setting a conda environment can be found here:

<https://conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html>

Tools – Jupyter Notebook



We'll use the following Python packages often:

- ***pandas*** – handles data analysis and manipulation (Excel on steroids)
- ***numpy*** – for intricate mathematical operations
- ***Matplotlib & seaborn*** – used for data visualization
- ***Scikit-learn*** – Multi-purpose package that with useful implementations of functions & Machine Learning algorithms
- **Other packages will be installed on-need**

Thank you!

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