

Jupyter Notebook

What is Jupyter Notebook?

Jupyter Notebook - an open source web application used to create and share documents that contain ~ live code ~ equations ~ visualizations ~ text

The Notebook extends the console-based approach to interactive computing

It's a web-based application for the whole computation process:- developing, documenting, executing code, and communicating the results

It's a spin-off from the IPython project, and is maintained by the open-source community at Project Jupyter -- <http://jupyter.org/>

What is the value of using Jupyter Notebook?

- ◆ **A Web Application:** a browser-based tool for interactive authoring of documents - combining text, mathematics, code, computations and rich media output.
- ◆ **Notebook Documents:** a representation of all content visible in the web application, including inputs and outputs of computations, explanatory text, mathematics, images, and rich media representations of objects.

We'll also install Jupyter Notebook in VS Code, to use directly inside the IDE, to have a single place to work from as we go.

Install Jupyter Notebook

In your terminal, type

```
pip install jupyter notebook
```

Install Jupyter Notebook in VS Code

Make sure you're in the correct directory

Open VS Code

Add the following Extensions by Microsoft: -
**Jupyter, Jupyter Keymap, Jupyter Notebook Renderer, Jupyter
Slide Show, and Jupyter Cell Tags**

How to start the Jupyter Notebook Server

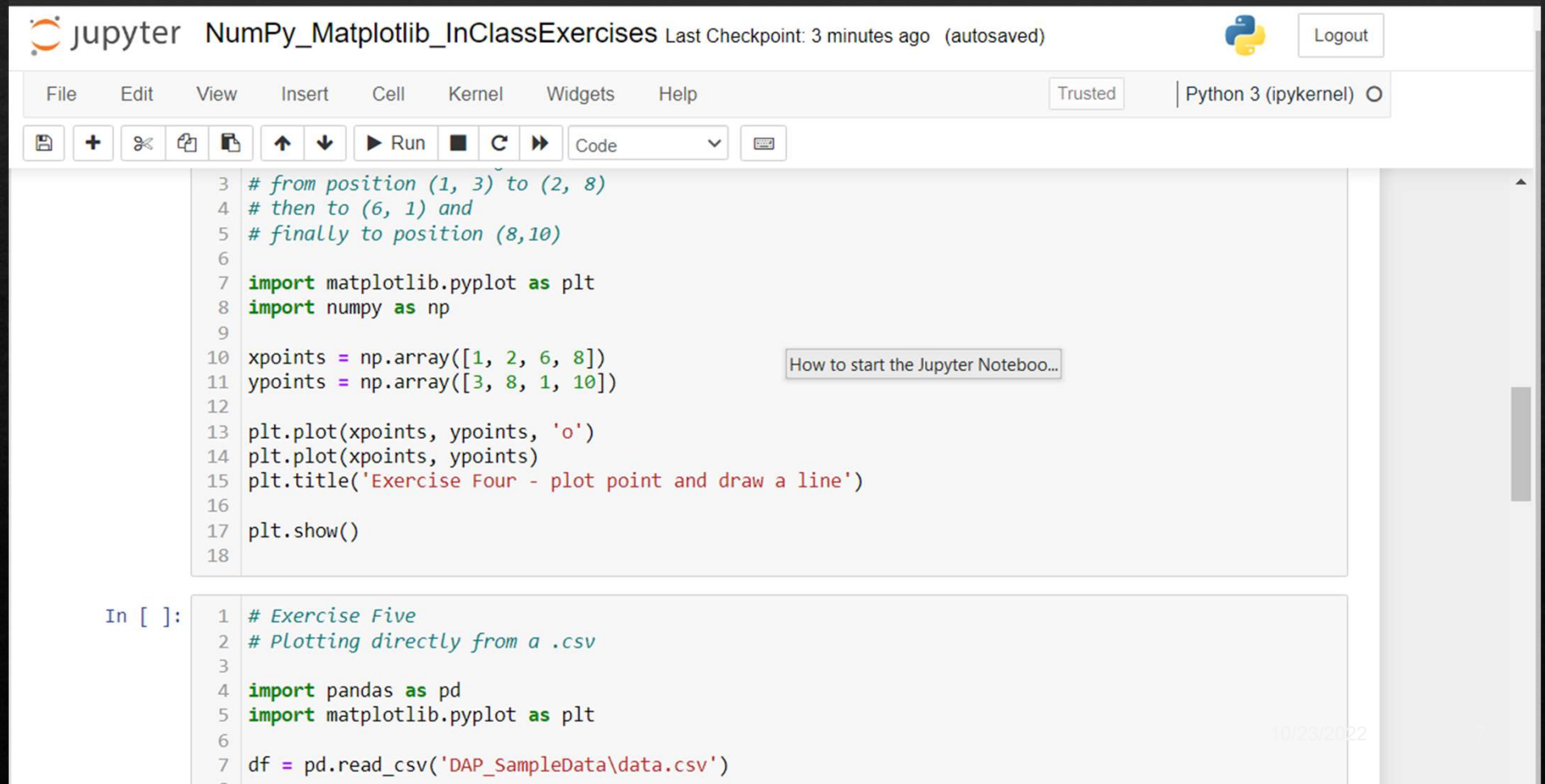
Type `jupyter notebook` in your terminal and press enter



The screenshot shows the Jupyter Notebook web interface. At the top, there are tabs for 'Files', 'Running', and 'Clusters'. Below the tabs, a message says 'Select items to perform actions on them.' To the right, there are buttons for 'Upload', 'New', and a refresh icon. A red arrow points to the 'New' button. A dropdown menu is open, showing options for creating new files or notebooks. The 'Python 3 (ipykernel)' option is highlighted with a red circle. Below the dropdown, a table lists existing files and notebooks.

Name	Age	Size
0		
PowerPoints		
Vocab and WalkThroughs		
WeekOne		
WeekTwo		
Untitled.ipynb	13 hours ago	3.51 kB
Untitled1.ipynb	13 hours ago	1.23 kB
Untitled2.ipynb	Running 13 minutes ago	20.4 kB
alex.JPG	5 days ago	23.2 kB
calculator.py	15 days ago	99 B
columnnames.py	11 days ago	242 B
columns.py	11 days ago	195 B
countdown.py	15 days ago	323 B
coursera.py	11 days ago	176 B
customizewritingto.py	11 days ago	242 B

Starting an existing Notebook should open a screen like this:



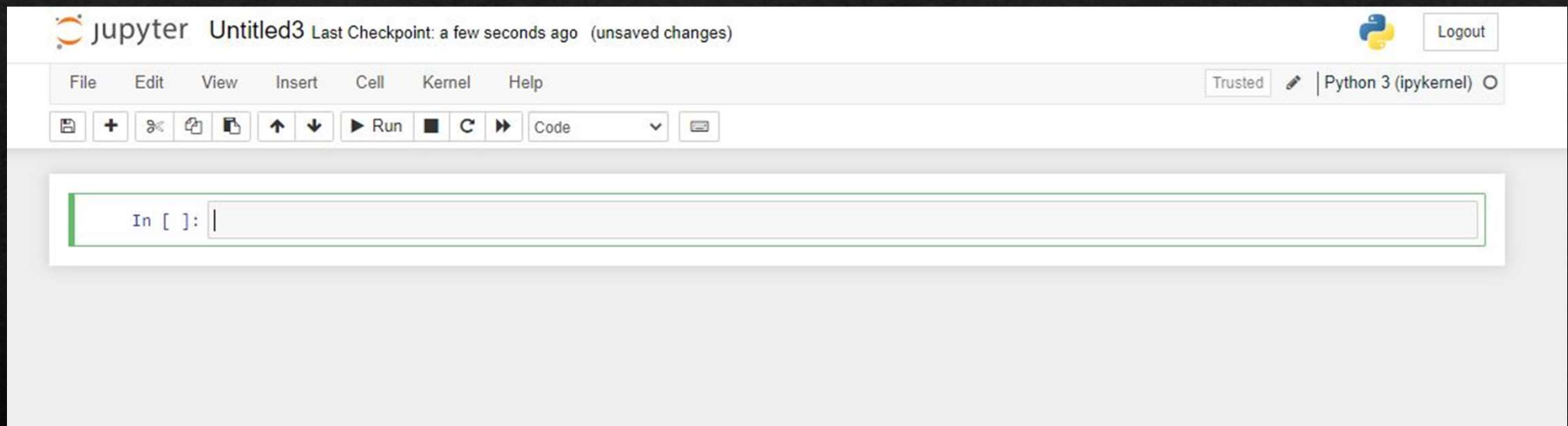
The screenshot displays a Jupyter Notebook interface with the following components:

- Header:** "jupyter NumPy_Matplotlib_InClassExercises" with a "Last Checkpoint: 3 minutes ago (autosaved)" status and a "Logout" button.
- Menu Bar:** File, Edit, View, Insert, Cell, Kernel, Widgets, Help.
- Toolbar:** Includes icons for saving, adding cells, undo, redo, running, and other standard Jupyter actions.
- Code Cells:**
 - Cell 1 (Top):** Contains code for plotting points and a line. The code is as follows:

```
3 # from position (1, 3) to (2, 8)
4 # then to (6, 1) and
5 # finally to position (8,10)
6
7 import matplotlib.pyplot as plt
8 import numpy as np
9
10 xpoints = np.array([1, 2, 6, 8])
11 ypoints = np.array([3, 8, 1, 10])
12
13 plt.plot(xpoints, ypoints, 'o')
14 plt.plot(xpoints, ypoints)
15 plt.title('Exercise Four - plot point and draw a line')
16
17 plt.show()
18
```
 - Cell 2 (Bottom):** Contains code for reading a CSV file. The code is as follows:

```
In [ ]: 1 # Exercise Five
2 # Plotting directly from a .csv
3
4 import pandas as pd
5 import matplotlib.pyplot as plt
6
7 df = pd.read_csv('DAP_SampleData\data.csv')
8
```
- Output Area:** A small tooltip "How to start the Jupyter Noteboo..." is visible over the first cell.
- Footer:** The date "10/23/2022" is displayed in the bottom right corner.

Starting a new kernel should open a screen like this:



Using Jupyter Notebook inside VS Code

Make sure you're in the correct directory in the Terminal

Open VS Code (code .)

Either Initialize Jupyter Notebook from the console; This will open the web interface (type `jupyter notebook`)

-- or --

Or to use Jupyter Notebook inside VS Code, create a new file with the `.ipynb` extension

FileEditSelectionViewGoRunTerminalHelp

new_file.ipynb - DAPJune2022 - Visual Studio Code

EXPLORER

> OPEN EDITORS

DAPJUNE2022

LogicalOperators.py

Loops_Try_Functions.py

mathModules.py

matplotlib_basic.py

new_file.ipynb

numpy_examples.py

NumPy_Matplotlib_15Example...

NumPy_Matplotlib_InClassExe...

pandas_examples.py

pandas_print_csv.py

pandas_read_csv.py

OUTLINE

No symbols found in document
'new_file.ipynb'

TIMELINE

IIS EXPRESS

new_file.ipynb X

new_file.ipynb > empty cell

+ Code + Markdown | ▶ Run All ≡ Clear Outputs of All Cells | ... Python 3.10.7 64-bit

▶ 1

[] Python

10/23/202210

master ↻ 🔗 0 0 5 Connect Jupyter Server: Local Tab Moves Focus Cell 1 of 1 🔗 Go Live ESLint ✓ Spell ✎ Prettier 🔔 { }

Read more about Jupyter Notebook

The Jupyter Notebooks Project

<https://jupyter.org>

Jupyter Notebook Quick Start Guide --

<https://jupyter-notebook-beginner-guide.readthedocs.io/en/latest/index.html>

How to Use Jupyter Notebook: A Beginner's Tutorial --

<https://www.dataquest.io/blog/jupyter-notebook-tutorial>

Excellent Article on beautifying Jupyter Notebooks

<https://towardsdatascience.com/enrich-your-jupyter-notebook-with-these-tips-55c8ead25255>