DS2006: Introduction to Data Science Course (LAB 1: Run Python Code using Visual Studio Code)

Pre-requesters

- This Lab is done in VS code
- Download and install Visual Studio Code from https://code.visualstudio.com/

1.0 Create a Visual Studio Project, Create a Python Virtual Environment and Run Your First Python Program

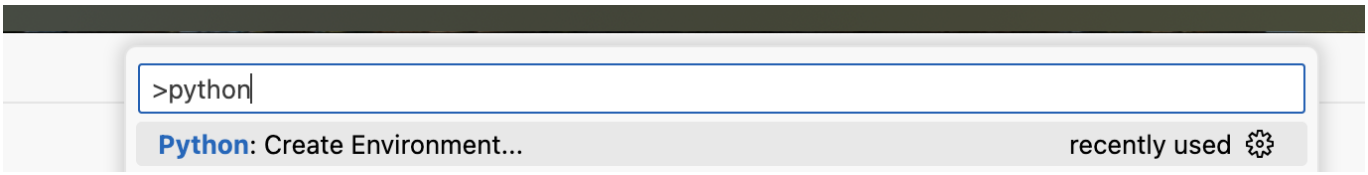
Create Visual Studio Code Project Folder using file explorer or command line

Open Project/Folder in Visual Studio Code

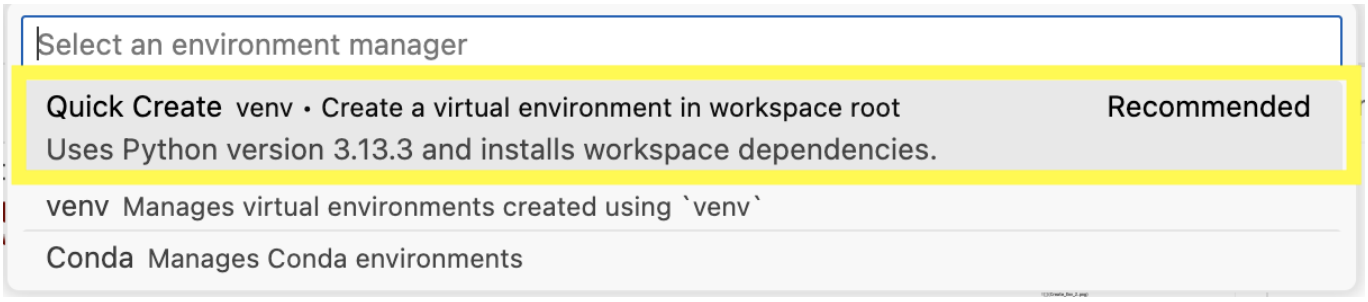
Create an environment

Press Ctrl+Shift+P (Windows/Linux) or Cmd+Shift+P (Mac) to open the Command Palette.

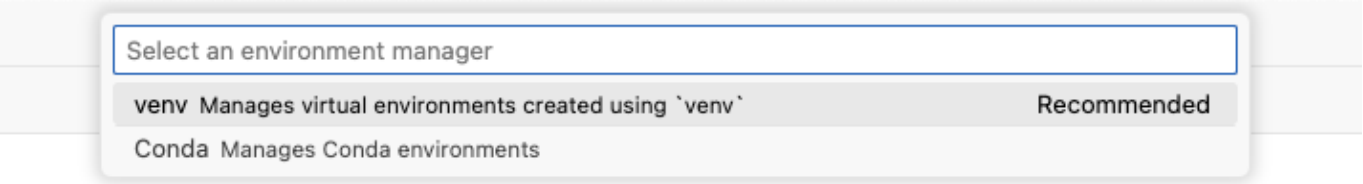
In the Command Palette, type Python: Create Environment and select it.



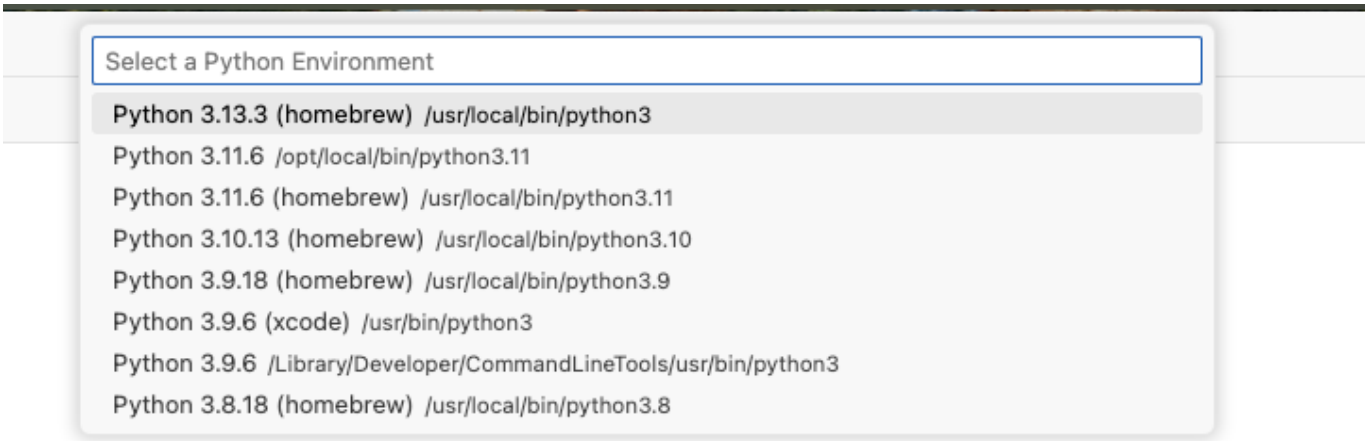
Select Create venv



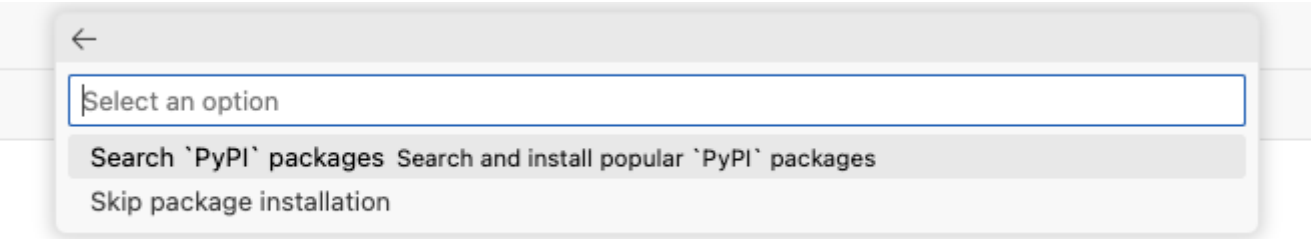
OR



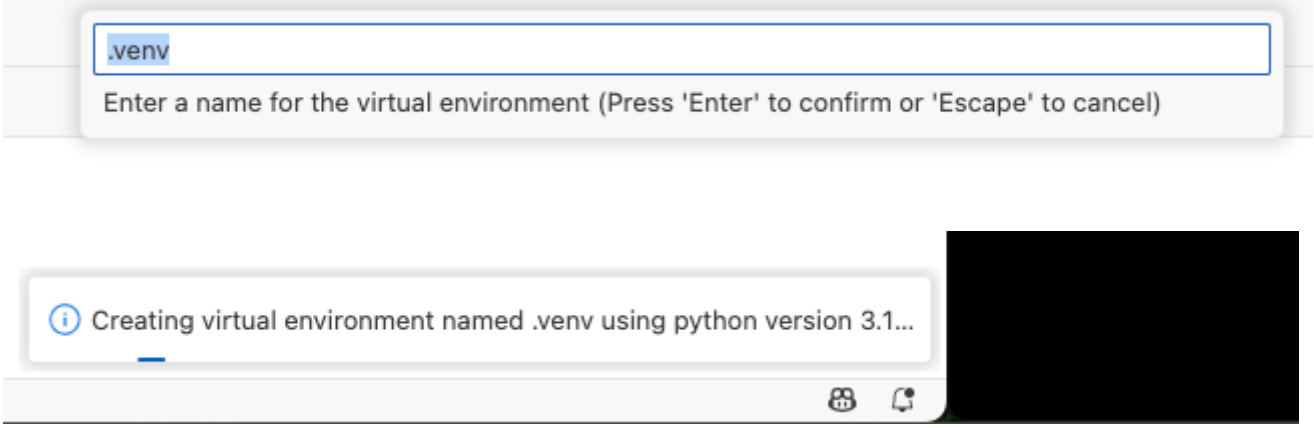
Select python environment (You could choose the **latest**)

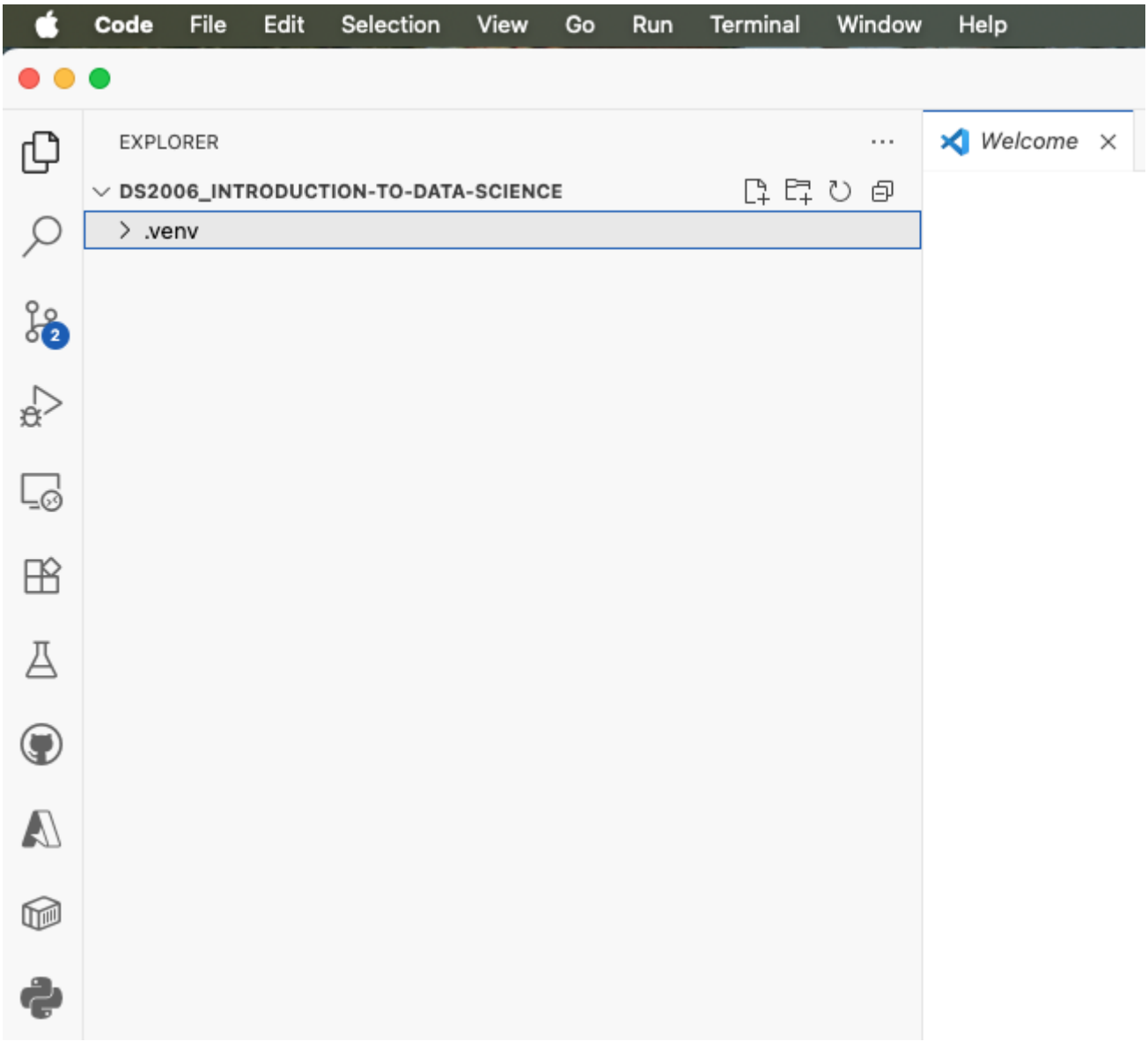


You could skip package installation

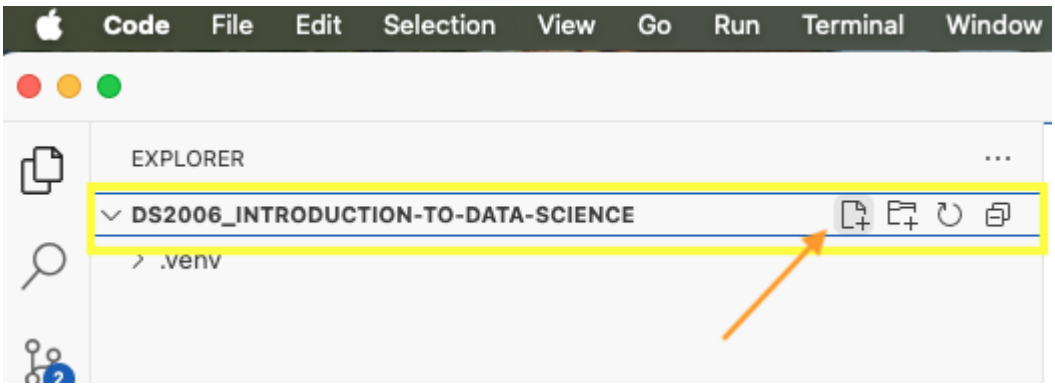


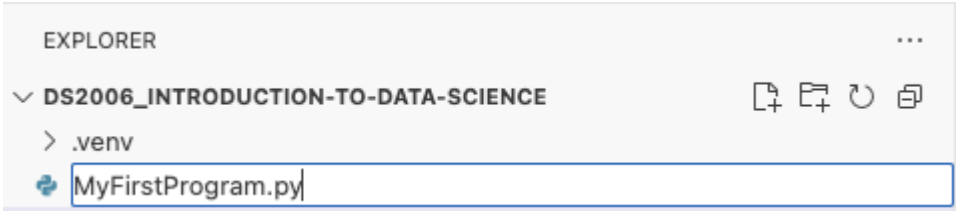
You **don't** need to change the name of the environment

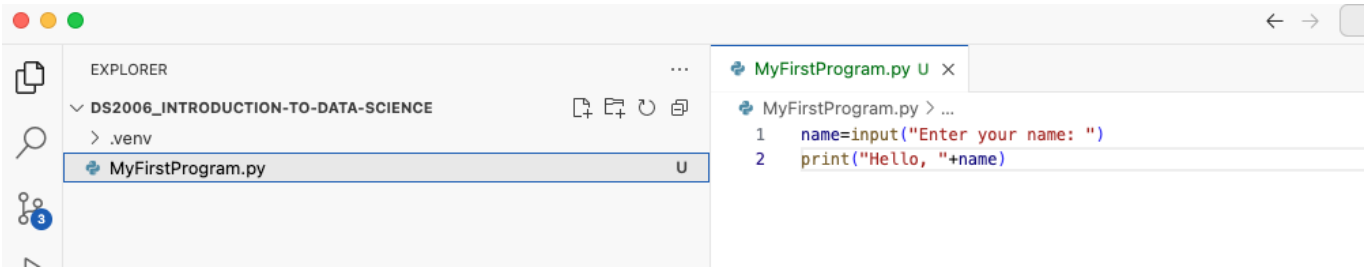




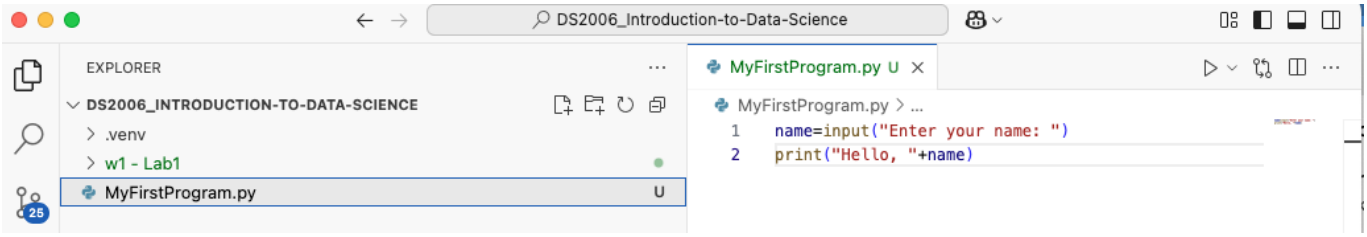
Create a new file







Run your First program



2.0 Create Lab1.py and successfully run it.

Create 'Lab1.py' and run it

Lab1.py U

w1 - Lab1 > Lab1.py > ...

```python
# Welcome message
print("Welcome to Python programming!")
# This initial Lab is just to get you familiar with python.

# Basic arithmetic operations
# Adding two numbers
result_addition = 2 + 6
print("The result of the addition is:", result_addition)

# Multiplying two numbers
result_multiplication = 5 * 3
print("The result of the multiplication is:", result_multiplication)

# Printing a simple message
print("Hello world")

# Variable assignments
A = 10  # Assigning value 10 to variable A
B = 4   # Assigning value 4 to variable B

# Performing and printing results of arithmetic operations
print("The result of the addition is", A + B)
print("The result of the multiplication is", A * B)
print("The result of the division is", A / B)

# Using variables to store user information
name = "Bob"  # Assigning a name to the variable
age = 28      # Assigning an age to the variable

# Printing user information
```

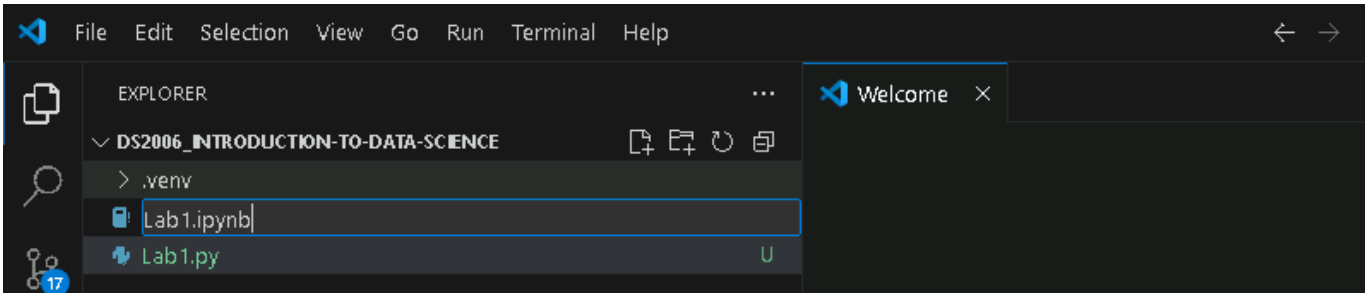
```python
print("Hi! My name is", name, "and I am", age, "years old.")
print(f"In 2 years, I will be {age + 2} years old.")

# Conditional statement based on age
if age > 30:
    print(f"Access granted. Welcome {name}.")
else:
    print(f"Access refused. Common {name}, you can come back in {30 - age} years.")

# List of usernames
usernames = ["Mark", "Sara", "Ahmad", "Johanna"]

# Looping through the list and printing welcome messages
for user in usernames:
    print(f"Welcome {user}")

# Looping to demonstrate range and multiplication
for i in range(0, 10):
    print(f"The double of {i} is {2 * i}")

# Experimenting with the print() function
# Printing a greeting message
print("Hello, Data Scientists!")

# Printing the user's full name
# Replace 'Your Full Name' with your actual name
print("Your Full Name")

# Demonstrating input function
pseudoname = input("Please enter your pseudoname: ")
print("Hello", pseudoname)


# Demonstrate final variable values.
print("The variable A is", A)
print("The variable B is", B)
print("The variable name is", name)
print("The variable age is", age)
print("The variable pseudoname is", pseudoname)
print("The variable usernames is", usernames)
```

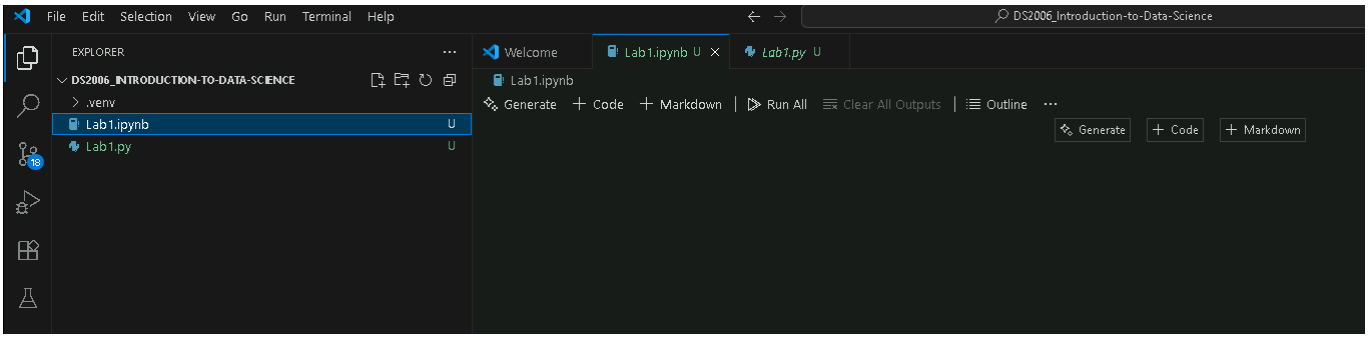
3.0 Convert Lab1.py into a jupyter notebook 'Lab1.ipynb' and successfully run it.

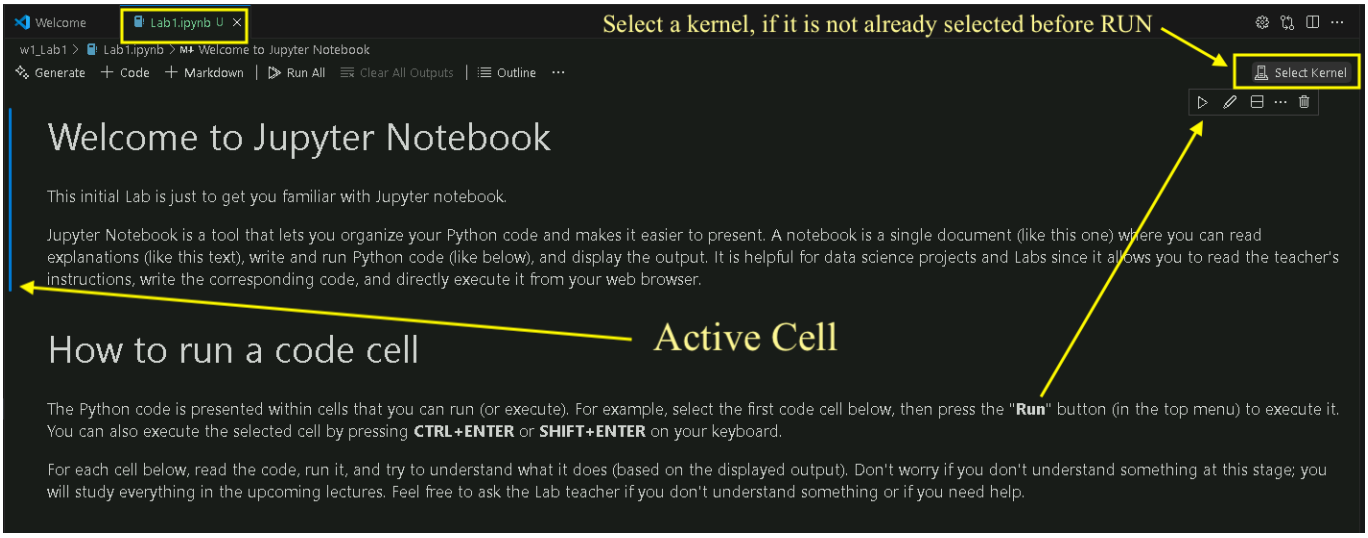
Convert `Lab1.py` content into `Lab1.ipynb`:

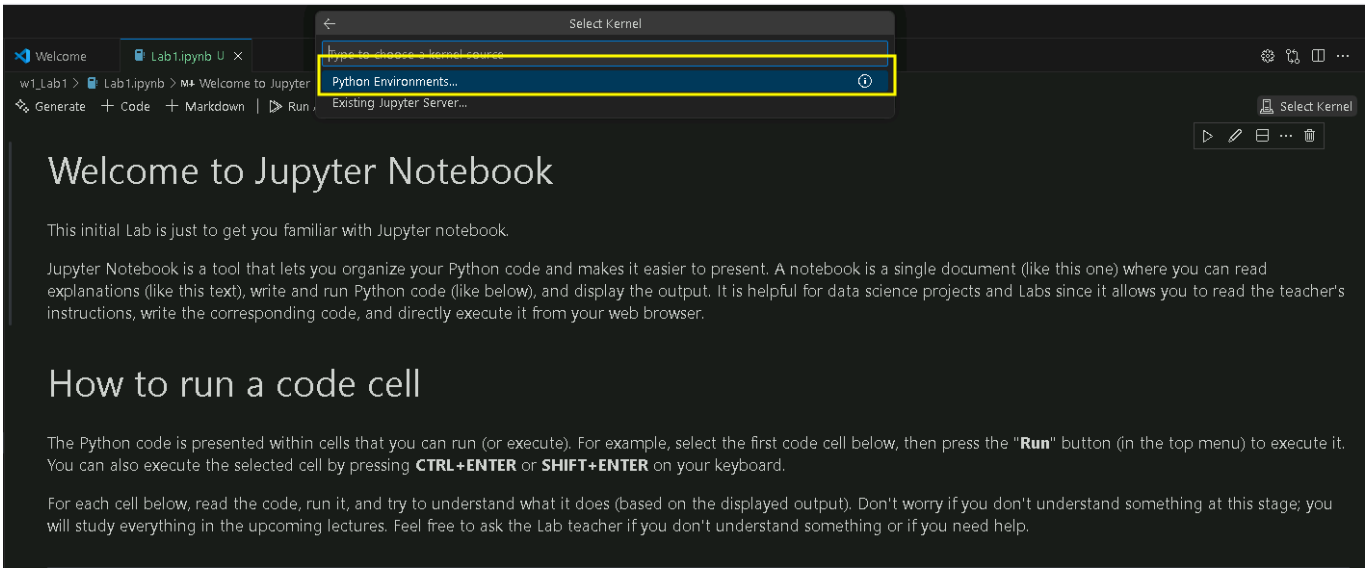
- Convert Comments in `Lab1.py` into Markdown cells (except the inline comments)
- Convert Code in in `Lab1.py` into Code cells (with inline comments)
- Run the Notebook
- Save it
- *Upload the note book (Lab1.ipynb) to Black Board.*

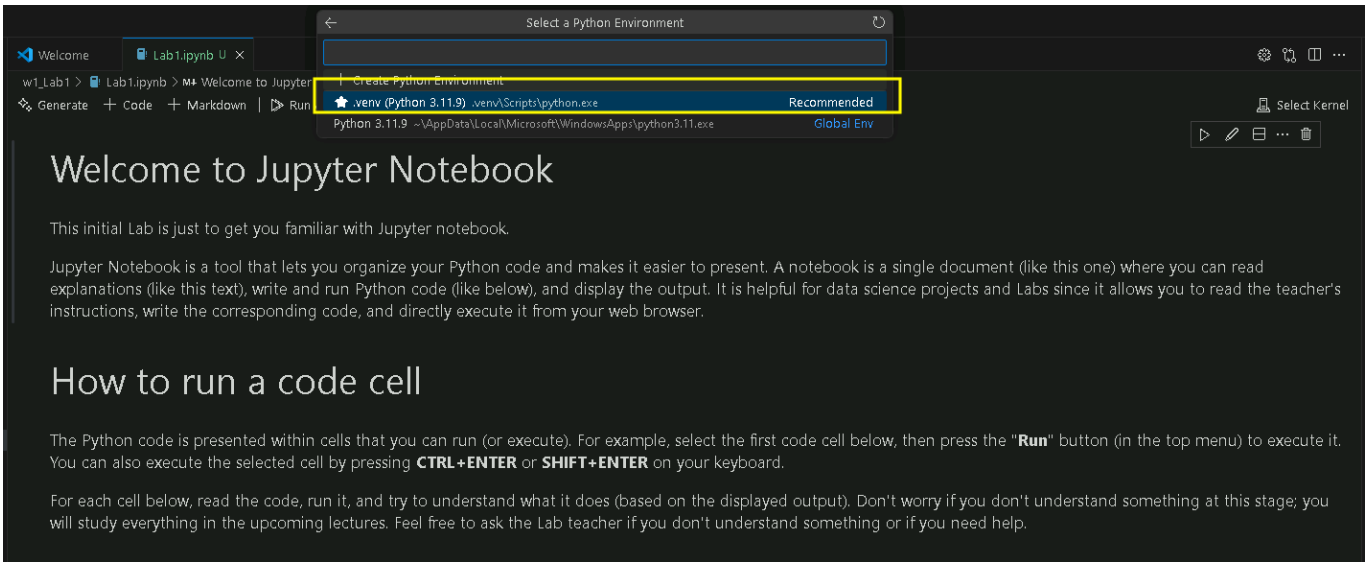
Create `Lab1.ipynb`

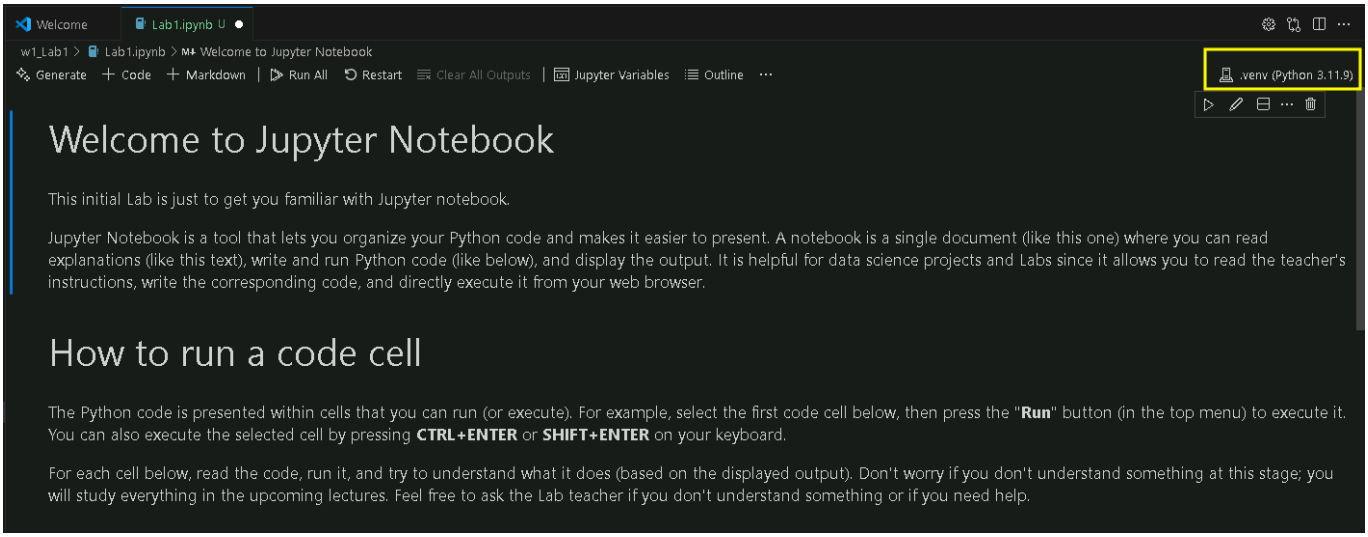


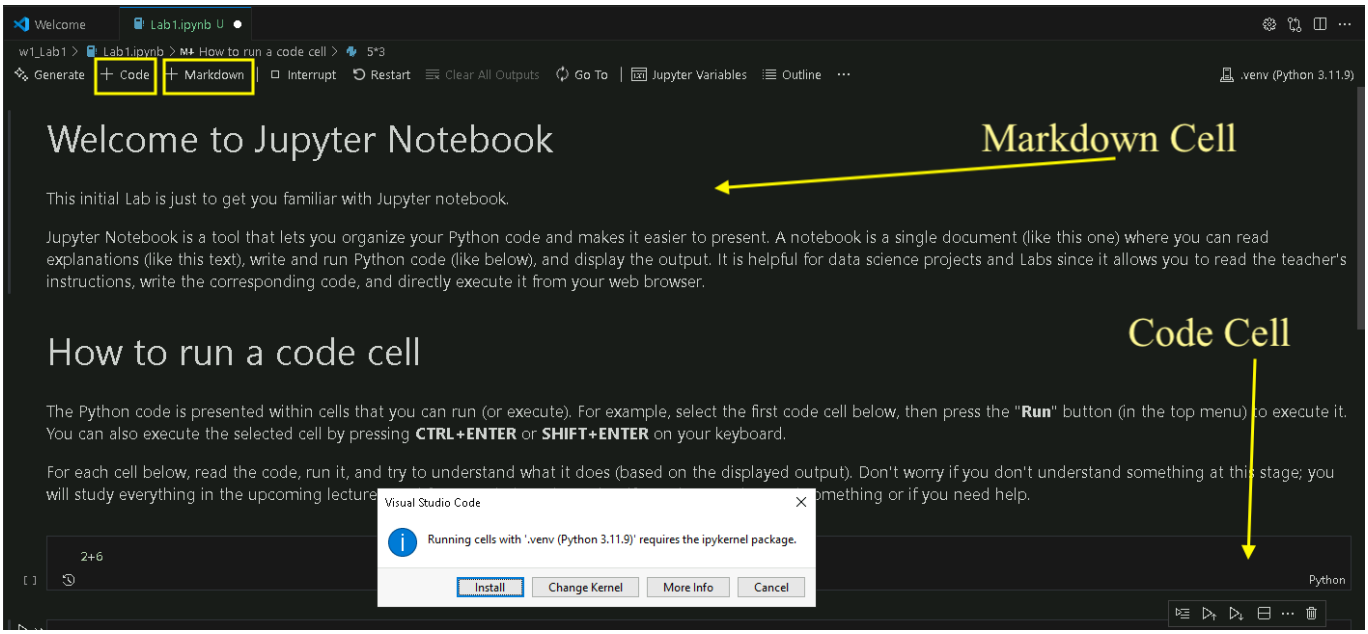


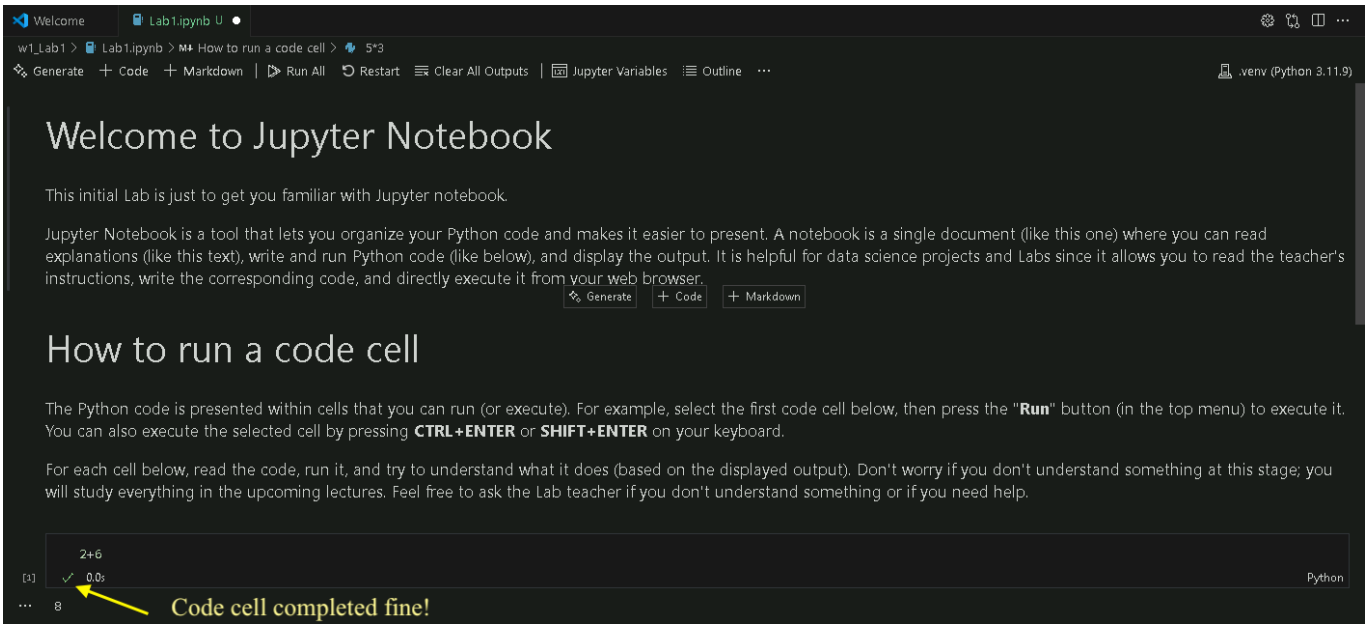


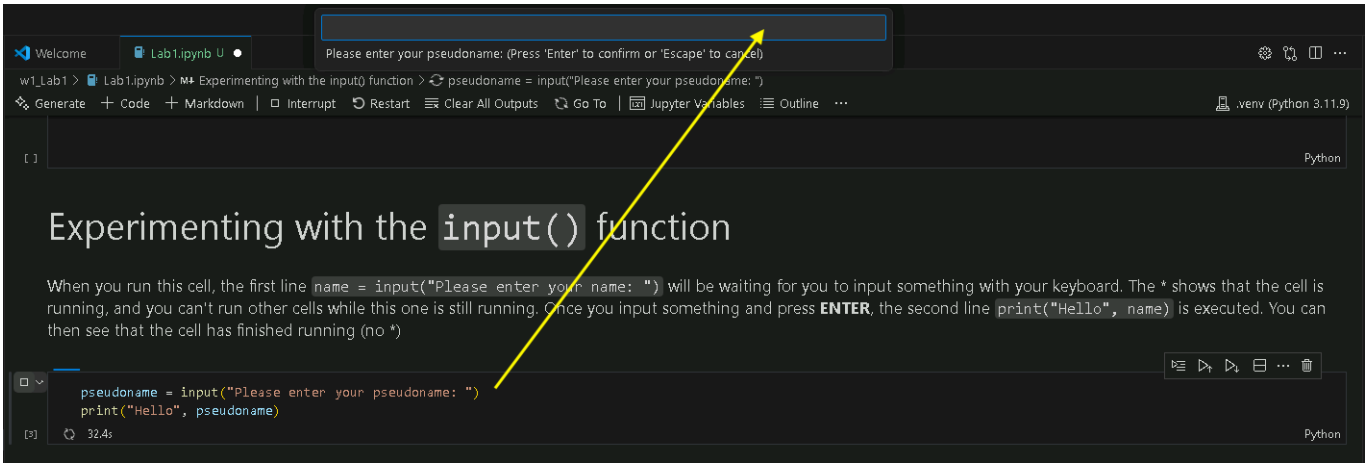


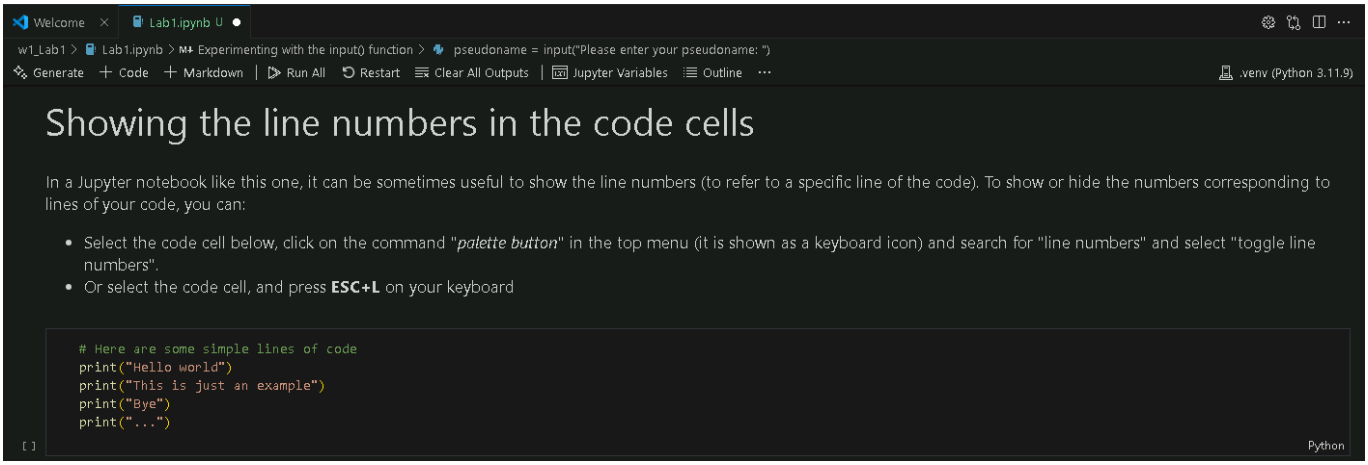

Select a Python Environment
Welcome
Lab1.ipynb U
Create Python Environment
.venv (Python 3.11.9) .venv\Scripts\python.exe
Recommended
Python 3.11.9 ~\AppData\Local\Microsoft\WindowsApps\python3.11.exe
Global Env
Select Kernel
Welcome to Jupyter Notebook
This initial Lab is just to get you familiar with Jupyter notebook.
Jupyter Notebook is a tool that lets you organize your Python code and makes it easier to present. A notebook is a single document (like this one) where you can read explanations (like this text), write and run Python code (like below), and display the output. It is helpful for data science projects and Labs since it allows you to read the teacher's instructions, write the corresponding code, and directly execute it from your web browser.
How to run a code cell
The Python code is presented within cells that you can run (or execute). For example, select the first code cell below, then press the "Run" button (in the top menu) to execute it. You can also execute the selected cell by pressing CTRL+ENTER or SHIFT+ENTER on your keyboard.
For each cell below, read the code, run it, and try to understand what it does (based on the displayed output). Don't worry if you don't understand something at this stage; you will study everything in the upcoming lectures. Feel free to ask the Lab teacher if you don't understand something or if you need help.

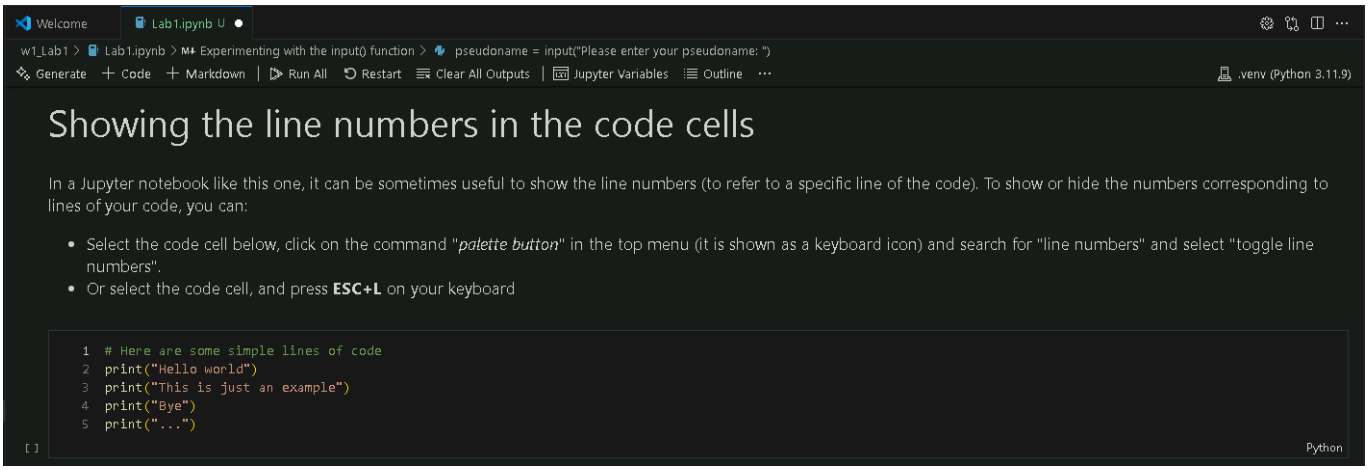

Welcome
Lab1.ipynb U
Generate
Code
Markdown
Run All
Restart
Clear All Outputs
Jupyter Variables
Outline
.venv (Python 3.11.9)
Welcome to Jupyter Notebook
This initial Lab is just to get you familiar with Jupyter notebook.
Jupyter Notebook is a tool that lets you organize your Python code and makes it easier to present. A notebook is a single document (like this one) where you can read explanations (like this text), write and run Python code (like below), and display the output. It is helpful for data science projects and Labs since it allows you to read the teacher's instructions, write the corresponding code, and directly execute it from your web browser.
How to run a code cell
The Python code is presented within cells that you can run (or execute). For example, select the first code cell below, then press the "Run" button (in the top menu) to execute it. You can also execute the selected cell by pressing CTRL+ENTER or SHIFT+ENTER on your keyboard.
For each cell below, read the code, run it, and try to understand what it does (based on the displayed output). Don't worry if you don't understand something at this stage; you will study everything in the upcoming lectures. Feel free to ask the Lab teacher if you don't understand something or if you need help.

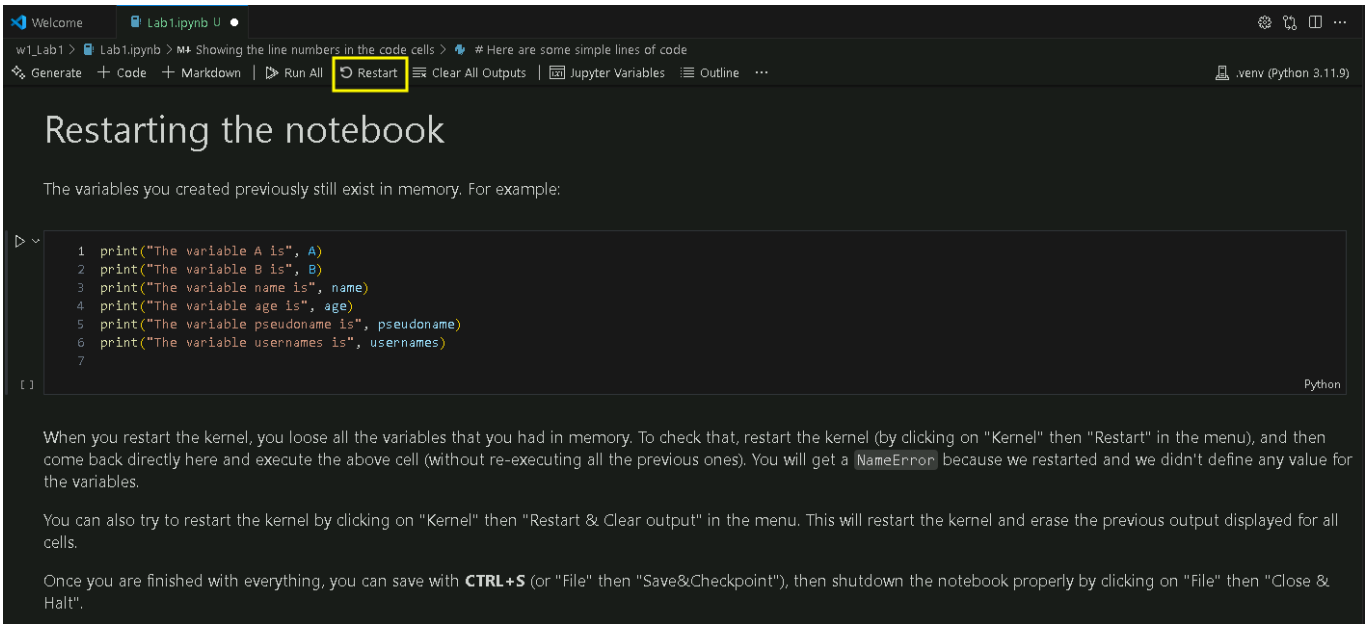

Welcome
Lab1.ipynb U
Generate
Code
Markdown
Interrupt
Restart
Clear All Outputs
Go To
Jupyter Variables
Outline
.venv (Python 3.11.9)
Welcome to Jupyter Notebook
Markdown Cell
This initial Lab is just to get you familiar with Jupyter notebook.
Jupyter Notebook is a tool that lets you organize your Python code and makes it easier to present. A notebook is a single document (like this one) where you can read explanations (like this text), write and run Python code (like below), and display the output. It is helpful for data science projects and Labs since it allows you to read the teacher's instructions, write the corresponding code, and directly execute it from your web browser.
How to run a code cell
Code Cell
The Python code is presented within cells that you can run (or execute). For example, select the first code cell below, then press the "Run" button (in the top menu) to execute it. You can also execute the selected cell by pressing CTRL+ENTER or SHIFT+ENTER on your keyboard.
For each cell below, read the code, run it, and try to understand what it does (based on the displayed output). Don't worry if you don't understand something at this stage; you will study everything in the upcoming lecture
omething or if you need help.
Visual Studio Code
Running cells with '.venv (Python 3.11.9)' requires the ipykernel package.
Install
Change Kernel
More Info
Cancel
2+6
Python


Welcome
Lab1.ipynb U
w1_Lab1 > Lab1.ipynb > How to run a code cell > 5*3
Generate
Code
Markdown
Run All
Restart
Clear All Outputs
Jupyter Variables
Outline
.venv (Python 3.11.9)
Welcome to Jupyter Notebook
This initial Lab is just to get you familiar with Jupyter notebook.
Jupyter Notebook is a tool that lets you organize your Python code and makes it easier to present. A notebook is a single document (like this one) where you can read explanations (like this text), write and run Python code (like below), and display the output. It is helpful for data science projects and Labs since it allows you to read the teacher's instructions, write the corresponding code, and directly execute it from your web browser.
Generate
Code
Markdown
How to run a code cell
The Python code is presented within cells that you can run (or execute). For example, select the first code cell below, then press the "Run" button (in the top menu) to execute it. You can also execute the selected cell by pressing CTRL+ENTER or SHIFT+ENTER on your keyboard.
For each cell below, read the code, run it, and try to understand what it does (based on the displayed output). Don't worry if you don't understand something at this stage; you will study everything in the upcoming lectures. Feel free to ask the Lab teacher if you don't understand something or if you need help.
2+6
[1]
0.0s
Python
8
Code cell completed fine!


Please enter your pseudoname: (Press 'Enter' to confirm or 'Escape' to cancel)
Welcome
Lab1.ipynb U
w1_Lab1 > Lab1.ipynb > Experimenting with the input() function > pseudoname = input("Please enter your pseudoname: ")
Generate
Code
Markdown
Interrupt
Restart
Clear All Outputs
Go To
Jupyter Variables
Outline
.venv (Python 3.11.9)
[ ]
Python
Experimenting with the input() function
When you run this cell, the first line name = input("Please enter your name: ") will be waiting for you to input something with your keyboard. The * shows that the cell is running, and you can't run other cells while this one is still running. Once you input something and press ENTER, the second line print("Hello", name) is executed. You can then see that the cell has finished running (no *)
pseudoname = input("Please enter your pseudoname: ")
print("Hello", pseudoname)
[3]
32.4s
Python


Welcome
Lab1.ipynb U
w1_Lab1 > Lab1.ipynb > Experimenting with the input() function > pseudoname = input("Please enter your pseudoname: ")
Generate
Code
Markdown
Run All
Restart
Clear All Outputs
Jupyter Variables
Outline
.venv (Python 3.11.9)
Showing the line numbers in the code cells
In a Jupyter notebook like this one, it can be sometimes useful to show the line numbers (to refer to a specific line of the code). To show or hide the numbers corresponding to lines of your code, you can:
Select the code cell below, click on the command "palette button" in the top menu (it is shown as a keyboard icon) and search for "line numbers" and select "toggle line numbers".
Or select the code cell, and press ESC+L on your keyboard
# Here are some simple lines of code
print("Hello world")
print("This is just an example")
print("Bye")
print("...")
[ ]
Python





Make sure you upload the note book (Lab1.ipynb) to Black Board.