Computing Laboratory

Python – Hands-on

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The Python interpreter

Source code $\rightarrow$ **(Python interpreter)** $\rightarrow$ **Executable**

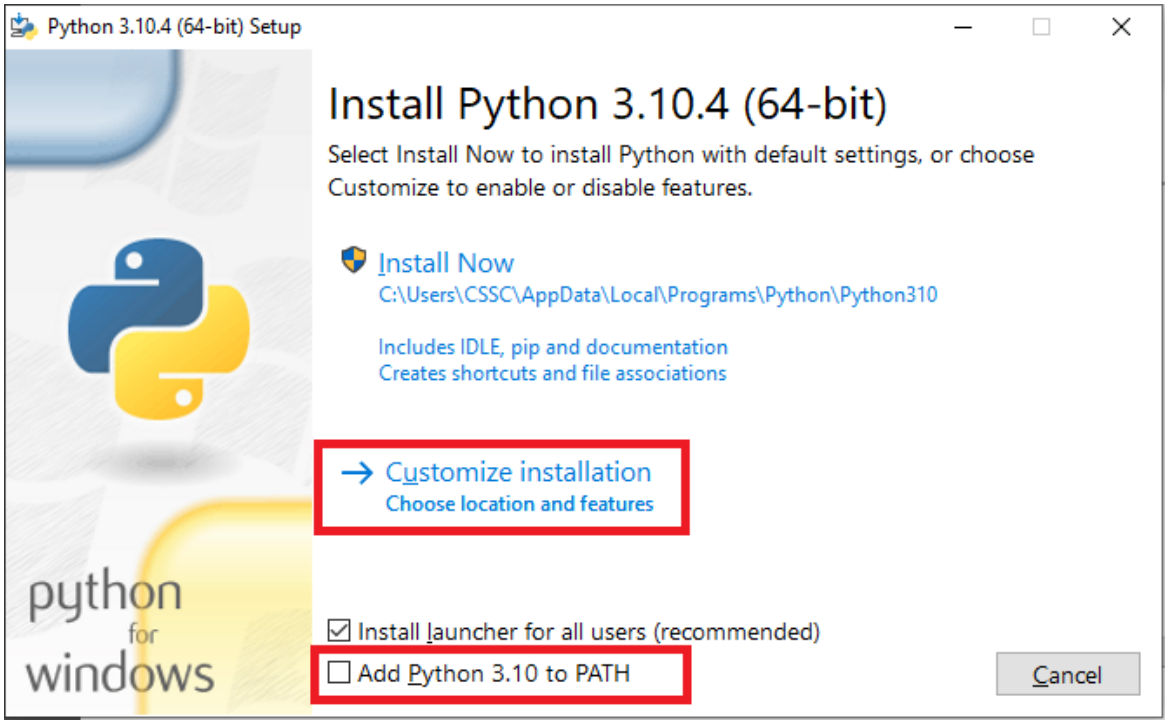
Standard versions of Python

Significant Features	Python 2	Python 3
`print`	As a statement	As a function
`xrange()`	Yes	No
Returning lists	Yes	No
Returning iterable objects	No	Yes
Unicode	No	Yes
`byte` type	No	Yes
Exception handling with `as`	No	Yes
Integer division	Traditional	New

Note: Python 1 is no more in use and Python 2 is soon to be obsolete.

Python installation

On Windows:



On Linux:

```
$ sudo apt-get update
$ sudo apt-get install <python_version> (say python3.10.4)
$ python3 --version
```

Installing/updating Python modules (i.e., packages)

Installing a specific module:

```
python -m pip3 install <module> (e.g. math, pandas, numpy)
```

Installing a specific version of module:

```
python -m pip3 install <module> == <version>
```

Installing a specific module with a minimum version:

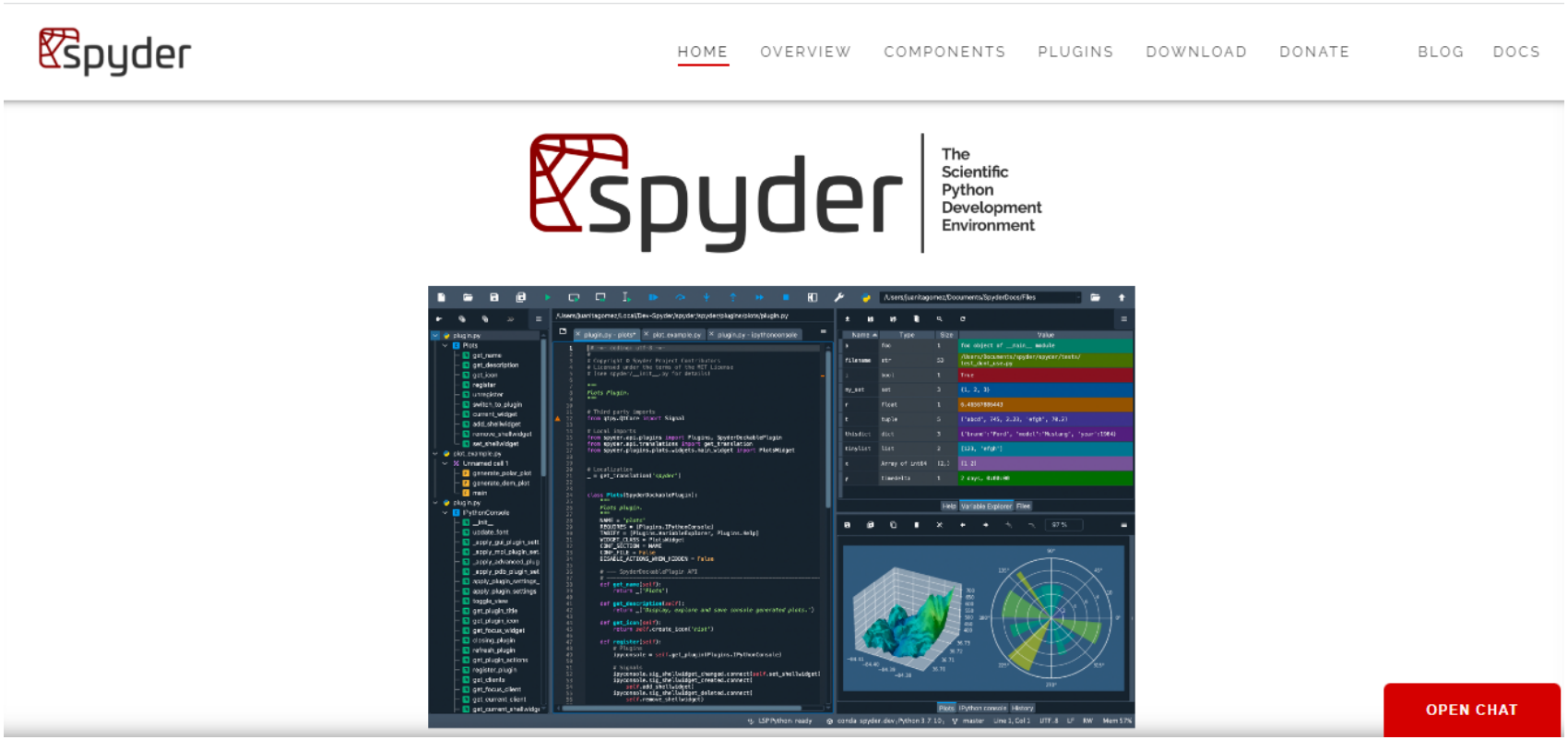
```
python -m pip3 install <module> >= <version>
```

Updating a specific module:

```
python -m pip3 install --upgrade <module>
```

Note: Installations/updates are to be done from the command prompt (not from the Python environment).

Installing Spyder (An IDE for Python)



Source: `https://www.spyder-ide.org` (current version is 5.4.3)

Installing Jupyter Lab

Installing JupyterLab 1.0:

`https://jupyter.org/install.html`

Installation with pip:

```
pip install jupyterlab
```

Running JupyterLab 1.0:

```
jupyter-lab
```

Installing Jupyter Notebook

Installing Jupyter Notebook:

`https://jupyter.org/install.html`

Installation with pip:

```
pip install notebook
```

Running Jupyter Notebook:

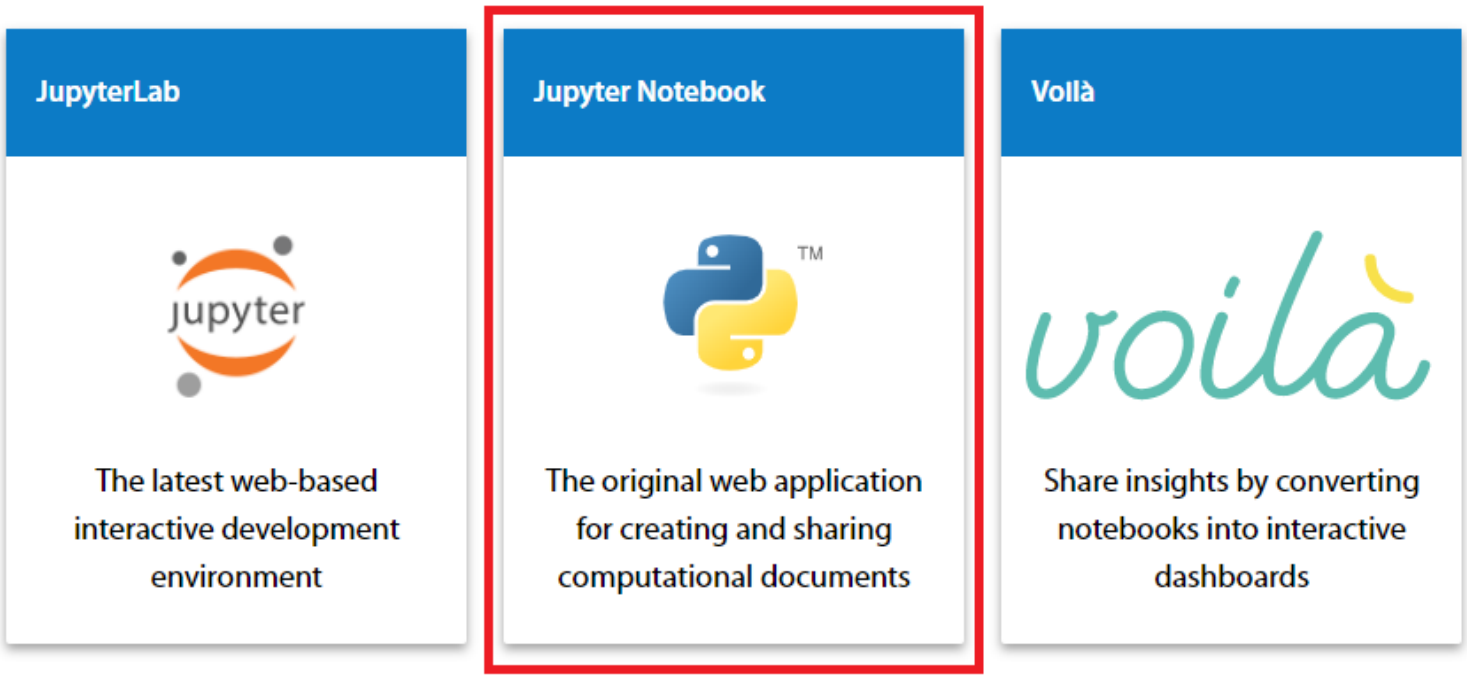
```
jupyter notebook
```

Using Jupyter Notebook in browser

Available at: `https://jupyter.org`

Open Jupyter Notebook in browser:
`https://jupyter.org/try`

Try Jupyter Notebook Application:



Installing modules (i.e., packages) on Jupyter Notebook

Installation in Jupyter shell:

```
!pip install <module> (e.g. xgboost)
```

Installation in Jupyter kernel:

```
import sys
!{sys.executable} -m pip install <module> (e.g. xgboost)
```

An important note

`pip` is generally connected with Python 2 on Linux and Mac, whereas `pip3` is connected with Python 3.

On the other hand, both `pip` and `pip3` can be used to install Python 3 packages on Windows.

Comparing Python with C

Source: Welcome2Python.py

Comparing Python with C

Source: Welcome2Python.py

```
print("Welcome 2 Python")
```

Comparing Python with C

Source: Welcome2Python.py

```
print("Welcome 2 Python")
```

Execution: Welcome2Python.py

Comparing Python with C

Source: Welcome2Python.py

```
print("Welcome 2 Python")
```

Execution: Welcome2Python.py

Welcome 2 Python**(cursor here!!!)**

Comparing Python with C

```
f = 0.7
if f == 0.7:
    print("Hi float")
print(type(f))
print(type(0.7))
```

Comparing Python with C

```
f = 0.7
if f == 0.7:
    print("Hi float")
print(type(f))
print(type(0.7))
```

Output:

```
Hi float
<class 'float'>
<class 'float'>
```

Comparing Python with C

```
int main()
{
    float f = 0.7;
    double d = 0.7;
    if(f == 0.7)
        printf("Hi float");
    if(d == 0.7)
        printf("Hi double");
    return 0;
}
```

Comparing Python with C

```
int main()
{
    float f = 0.7;
    double d = 0.7;
    if(f == 0.7)
        printf("Hi float");
    if(d == 0.7)
        printf("Hi double");
    return 0;
}
```

Output:

```
Hi double
```