Intro and Setup

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Required Materials

- Laptop running Windows, OSX, or Linux
- Internet Connection

Required Software

jupyter
spyder
ANACONDA®

What is Anaconda?

Why do we want to use it?

What is Anaconda?

Anaconda is a package manager for Python

- Provides: easily installed, curated packages that do not conflict. Installs most important python software with a push of a button

What is Spyder?

Spyder - included in the full install, is an open source (free) IDE for Python

Jupyter Notebooks

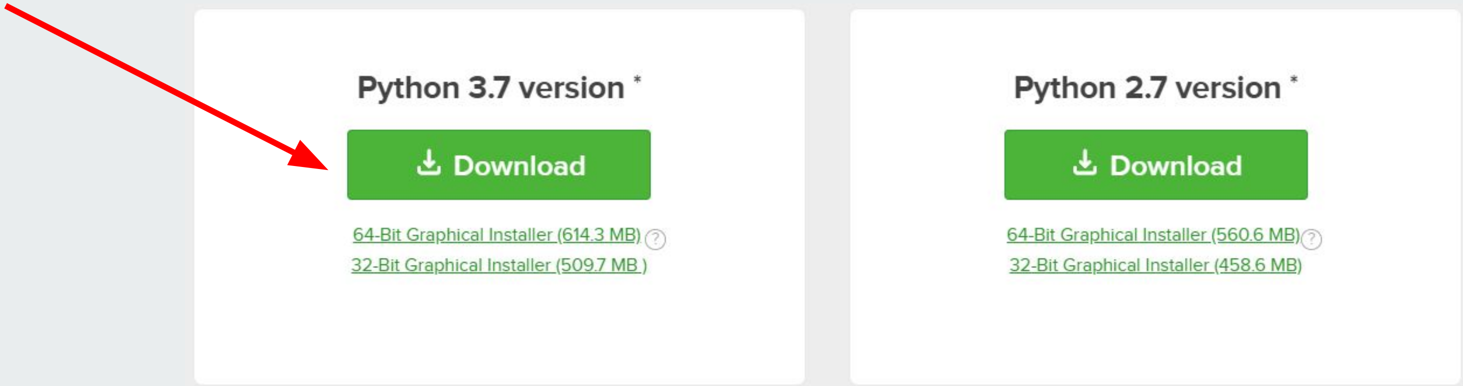
Jupyter notebooks provide an easy way to run and see the output of a Python program

Getting Setup

Download from https://www.anaconda.com/downloads/

(make sure to download the 3.7 version)

The graphical installer is easiest and can be used for mac and PC



Python 3.7 version *

64-Bit Graphical Installer (614.3 MB)

32-Bit Graphical Installer (509.7 MB)

Python 2.7 version *

64-Bit Graphical Installer (560.6 MB)

32-Bit Graphical Installer (458.6 MB)

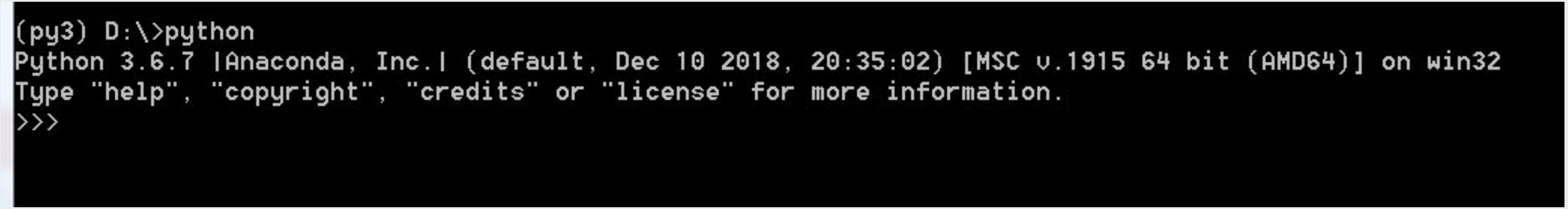
Getting Setup

Find where you downloaded the Anaconda installer and start the installation process

- The graphical installer it is likely on the downloads folder, just double click it.
- Allow Anaconda to prepend paths (select YES on setting the PATH during setup)
  - This is likely an **unselected** checkbox (that is you have to check it!)

Running Python from the Command Line

- Find and open your terminal, this will be powershell on PC and shell/terminal on mac
- Launch python from the shell, by typing ‘python’
- Should look like this:

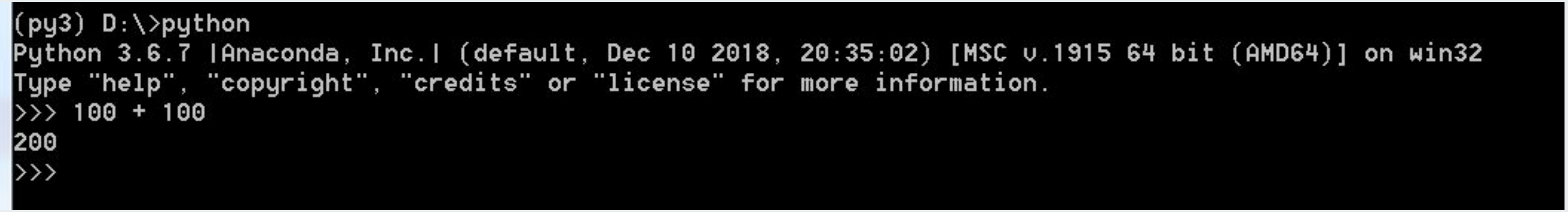


```
(py3) D:\>python
Python 3.6.7 |Anaconda, Inc.| (default, Dec 10 2018, 20:35:02) [MSC v.1915 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

- Make sure the version is Python 3.6 or above

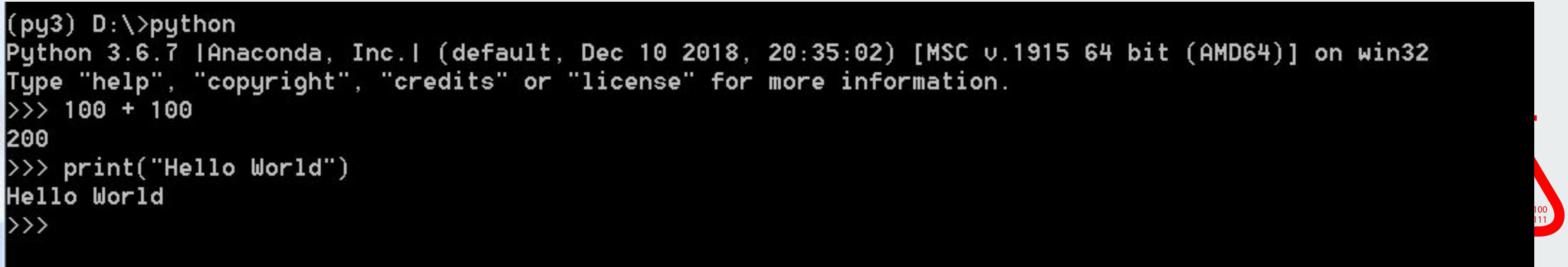
Python - simple test commands

- Type in 100 + 100 and hit enter - should get a response of 200



```
(py3) D:\>python
Python 3.6.7 |Anaconda, Inc.| (default, Dec 10 2018, 20:35:02) [MSC v.1915 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 100 + 100
200
>>>
```

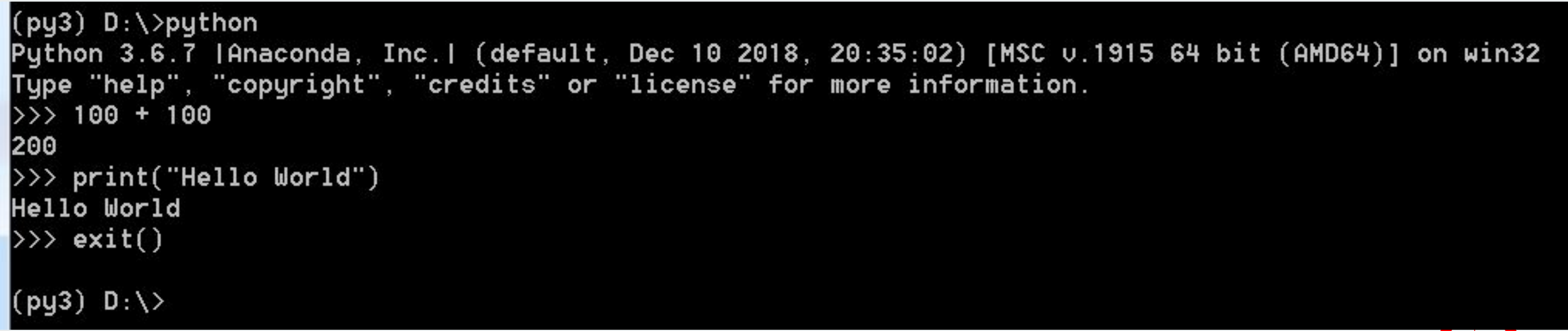
- Next type in a simple print command in Python:
  - print(“Hello World”)



```
(py3) D:\>python
Python 3.6.7 |Anaconda, Inc.| (default, Dec 10 2018, 20:35:02) [MSC v.1915 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 100 + 100
200
>>> print("Hello World")
Hello World
>>>
```

Python - simple test commands

- This interpreter is useful for short commands or testing of some code but probably isn’t practical for a large program
  - To exit: type exit() or CTRL-D



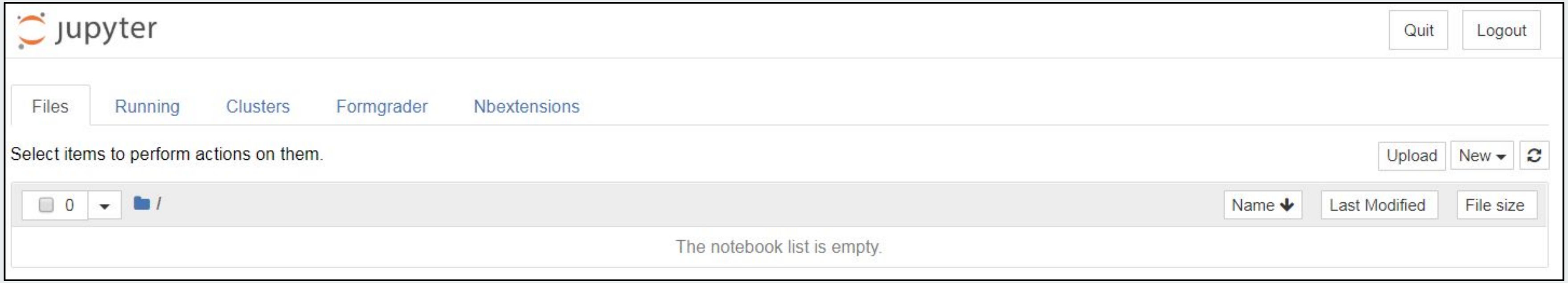
```
(py3) D:\>python
Python 3.6.7 |Anaconda, Inc.| (default, Dec 10 2018, 20:35:02) [MSC v.1915 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> 100 + 100
200
>>> print("Hello World")
Hello World
>>> exit()

(py3) D:\>
```

Python - Jupyter Notebook

Opening Jupyter Notebook

- Type in ‘jupyter notebook’ on your command line
- The notebook server should open in your browser like this:

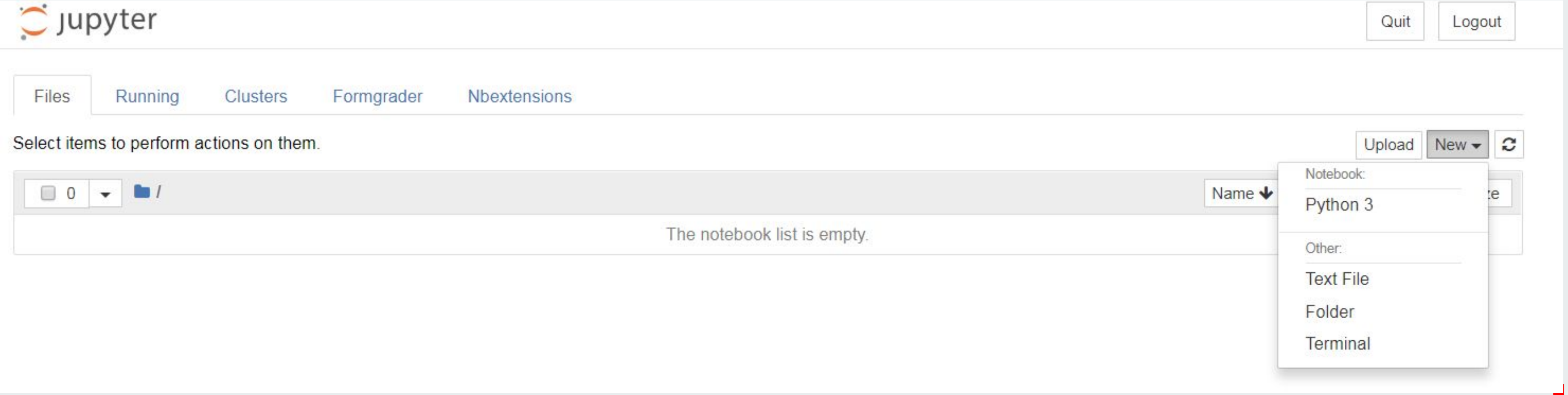


Select items to perform actions on them.

The notebook list is empty.

Opening Jupyter Notebook

- In the upper right click on New - and then Python 3 from the dropdown menu

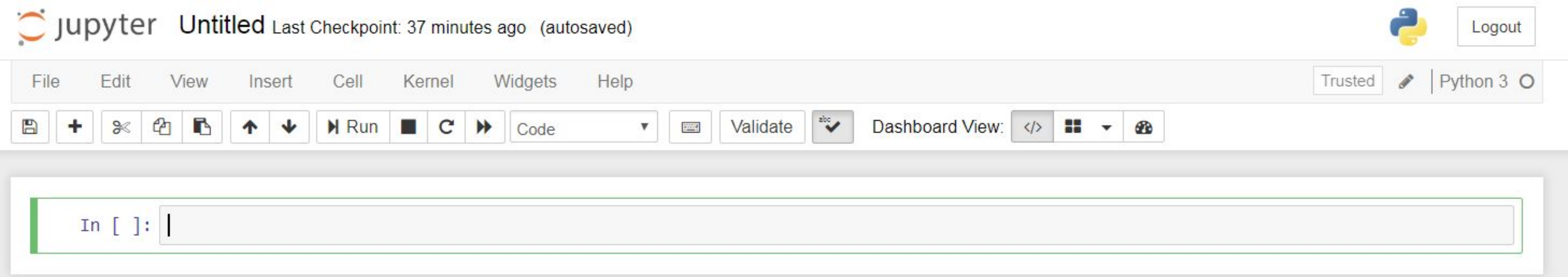


Select items to perform actions on them.

The notebook list is empty.

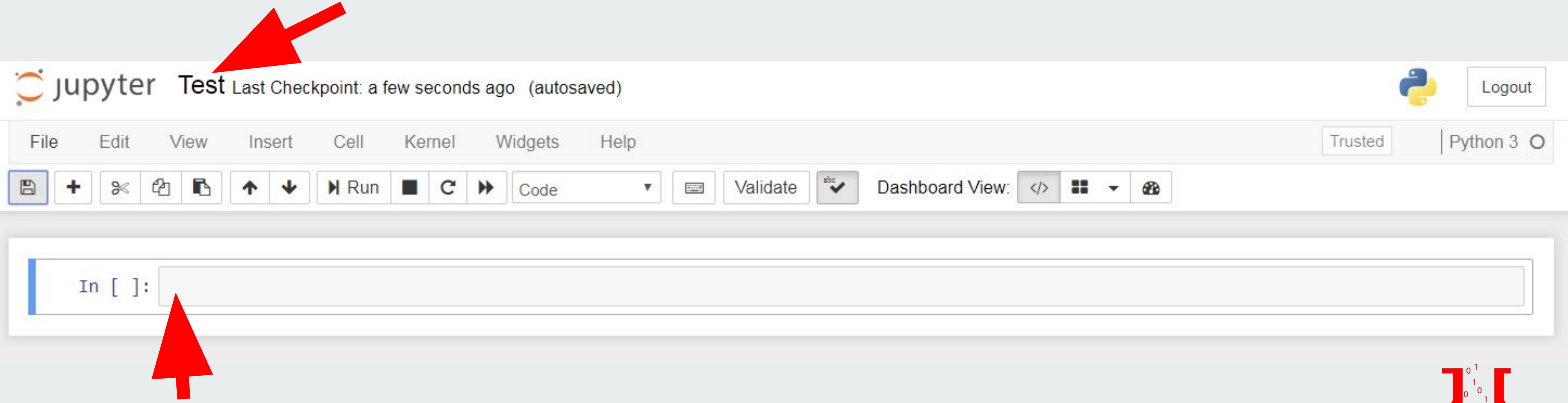
Opening Jupyter Notebook

- That should bring up a new tab in the browser that looks like this:



Coding in a Jupyter Notebook

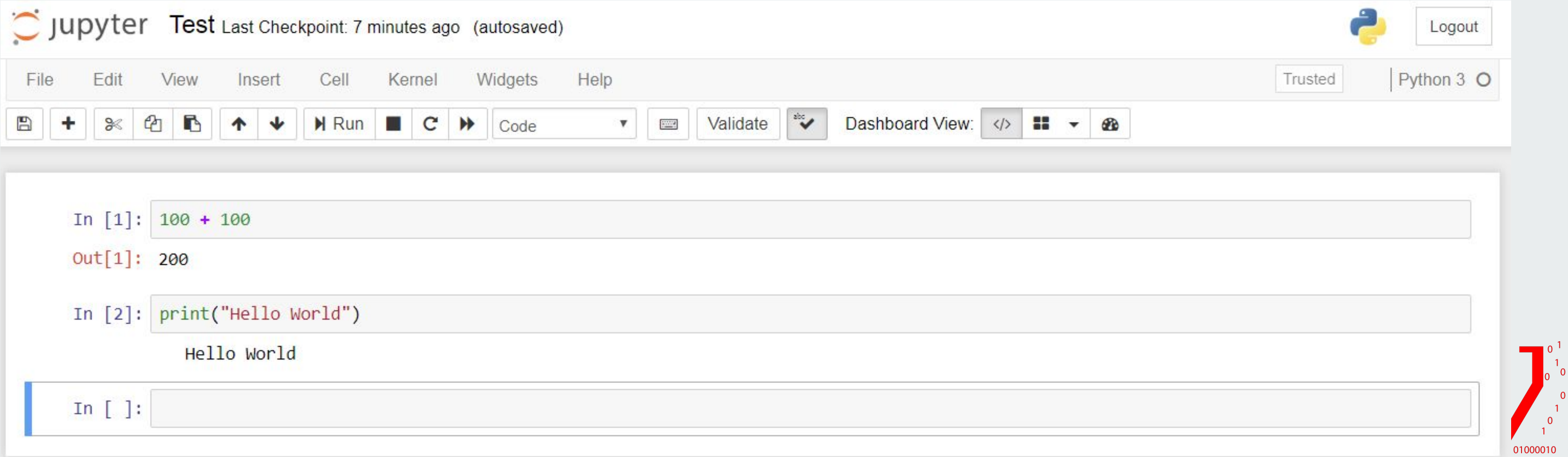
- Change the title: test



Coding Cell

Coding in a Jupyter Notebook

- In the coding cell type in 100 + 100
- Click the ‘Run’ button (or SHIFT-ENTER) to run the code cell



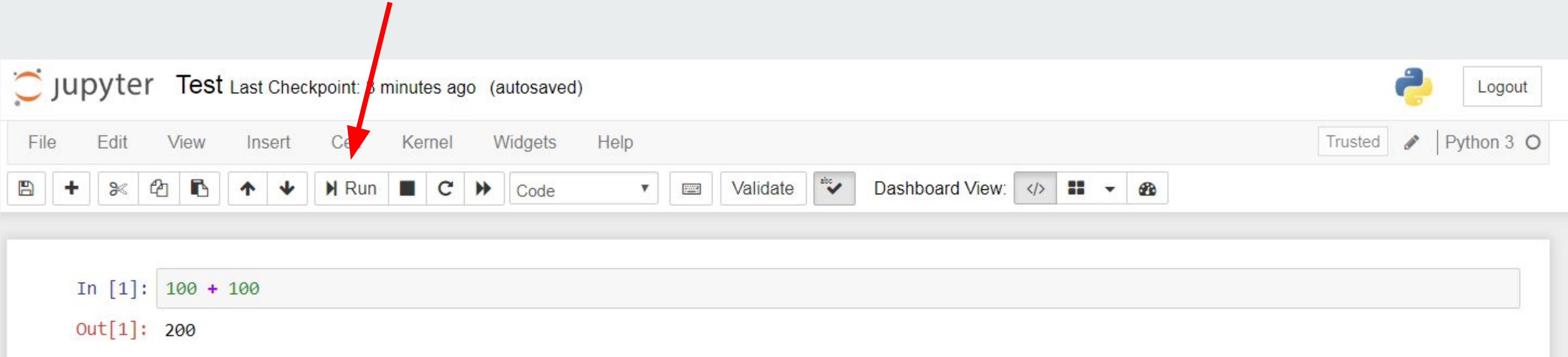
```
In [1]: 100 + 100
Out[1]: 200

In [2]: print("Hello World")
        Hello World

In [ ]:
```

Coding in a Jupyter Notebook

- In the next coding cell type in print(“Hello World”)
- Again Click the ‘Run’ button (or SHIFT-ENTER) to run the code cell

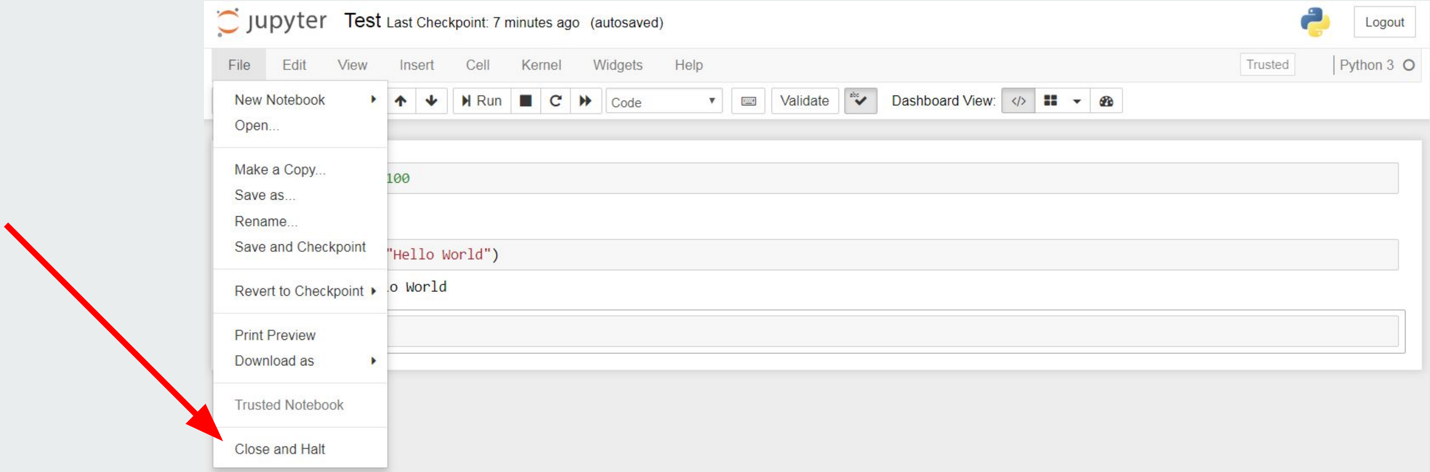


```
In [1]: 100 + 100

Out[1]: 200
```

Exiting Jupyter Notebook

- To exit jupyter notebook - click on the File menu; select Close and Halt
- It is important to exit this way, if you just ‘X’ out of the tab - the notebook will still be running in the background (and this can chew up system resources!)



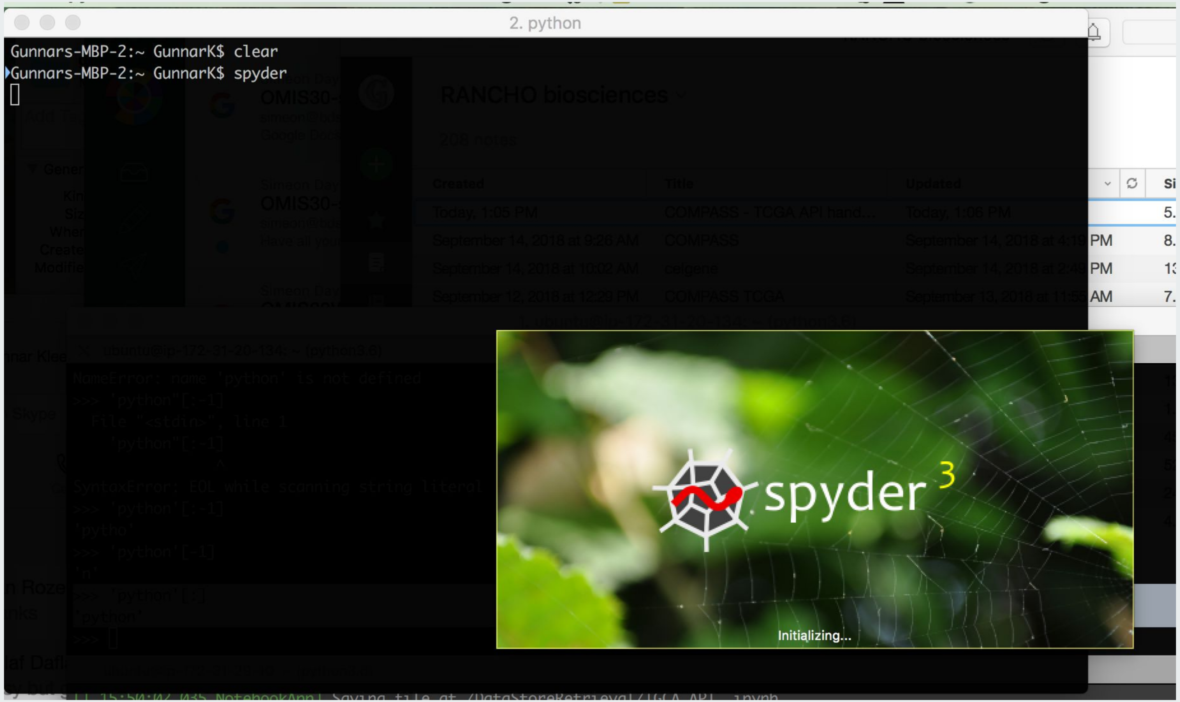
```
100
"Hello World")
o World
```

Using Spyder

- What is an IDE and how do we use it?
- When do we use an IDE vs a notebook?

Opening Spyder

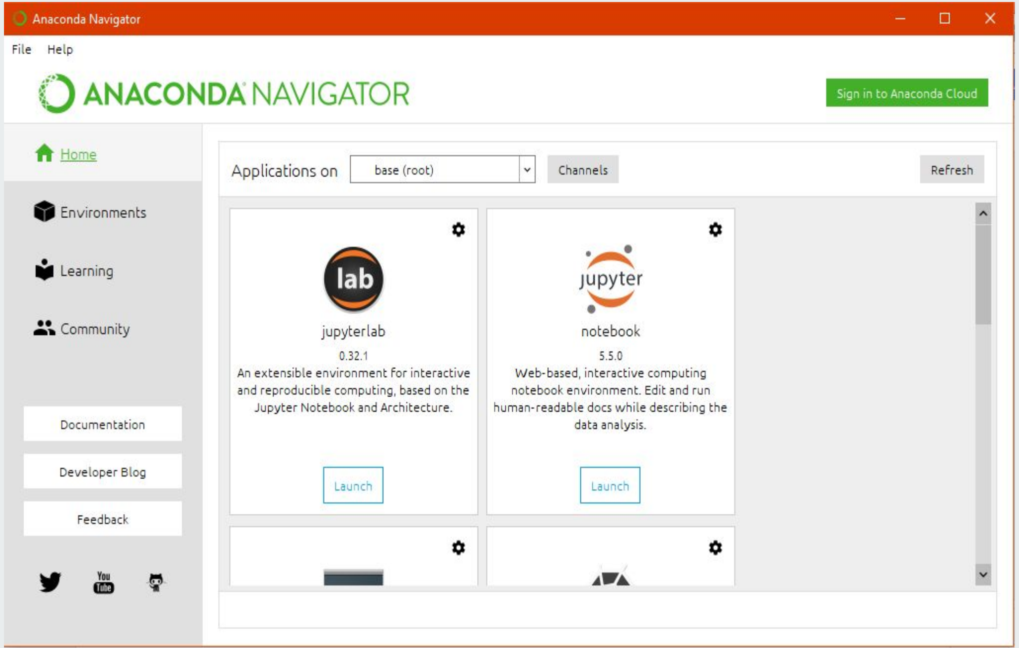
- Command Line/Terminal - type ‘spyder’ from the command line



```
Gunnars-MBP-2:~ GunnarK$ clear
Gunnars-MBP-2:~ GunnarK$ spyder
```

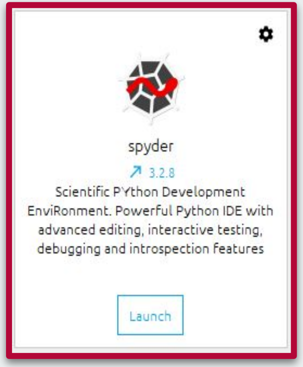
Opening Spyder

- Anaconda Navigator



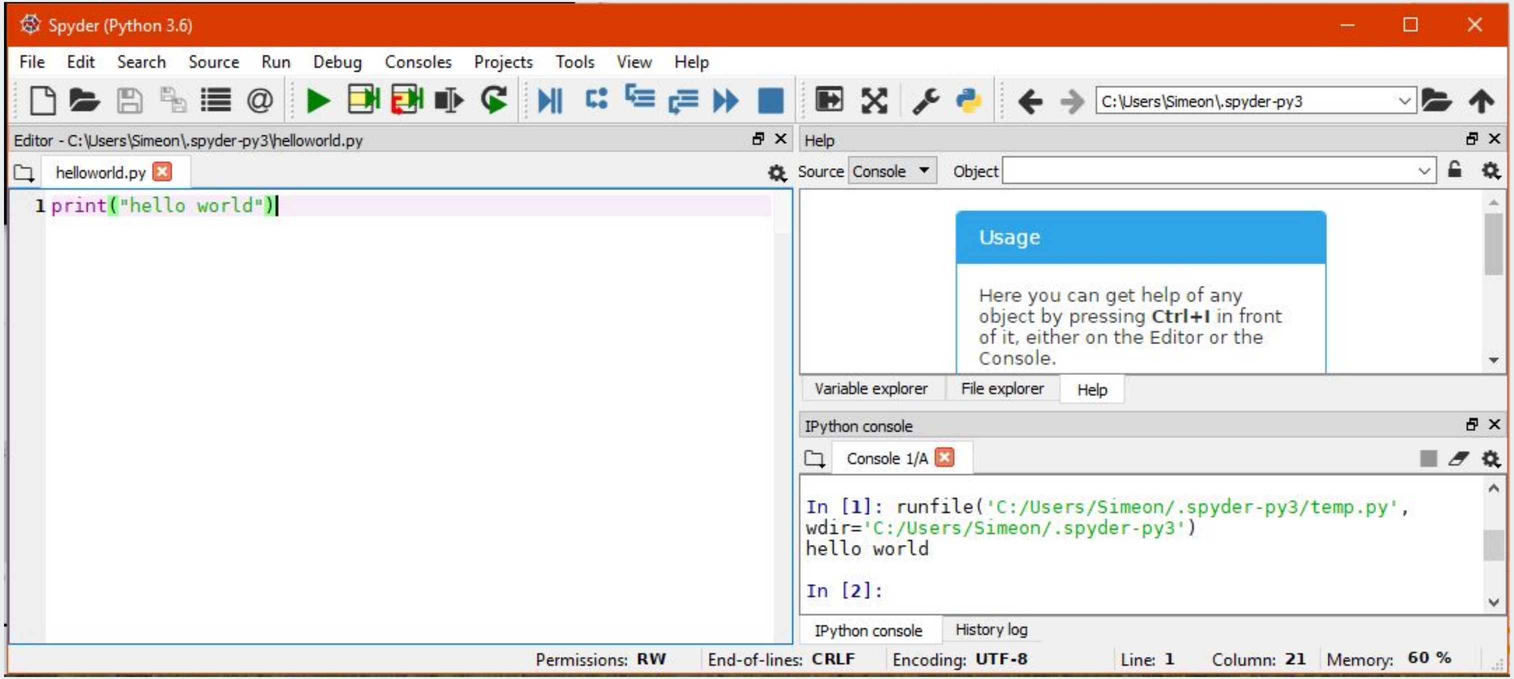
An extensible environment for interactive and reproducible computing, based on the Jupyter Notebook and Architecture.

Web-based, interactive computing notebook environment. Edit and run human-readable docs while describing the data analysis.



Scientific PYthon Development EnviRonment. Powerful Python IDE with advanced editing, interactive testing, debugging and introspection features

Using Spyder


Spyder (Python 3.6)
File Edit Search Source Run Debug Consoles Projects Tools View Help
C:\Users\Simeon\.spyder-py3
Editor - C:\Users\Simeon\.spyder-py3\helloworld.py
helloworld.py
Help
Source Console Object
Usage
Variable explorer File explorer Help
IPython console
Console 1/A
IPython console History log

Here you can get help of any object by pressing **Ctrl+I** in front of it, either on the Editor or the Console.

```
print("hello world")
```

```
In [1]: runfile('C:/Users/Simeon/.spyder-py3/temp.py',
wdir='C:/Users/Simeon/.spyder-py3')
hello world

In [2]:
```

Permissions: RW End-of-lines: CRLF Encoding: UTF-8 Line: 1 Column: 21 Memory: 60 %

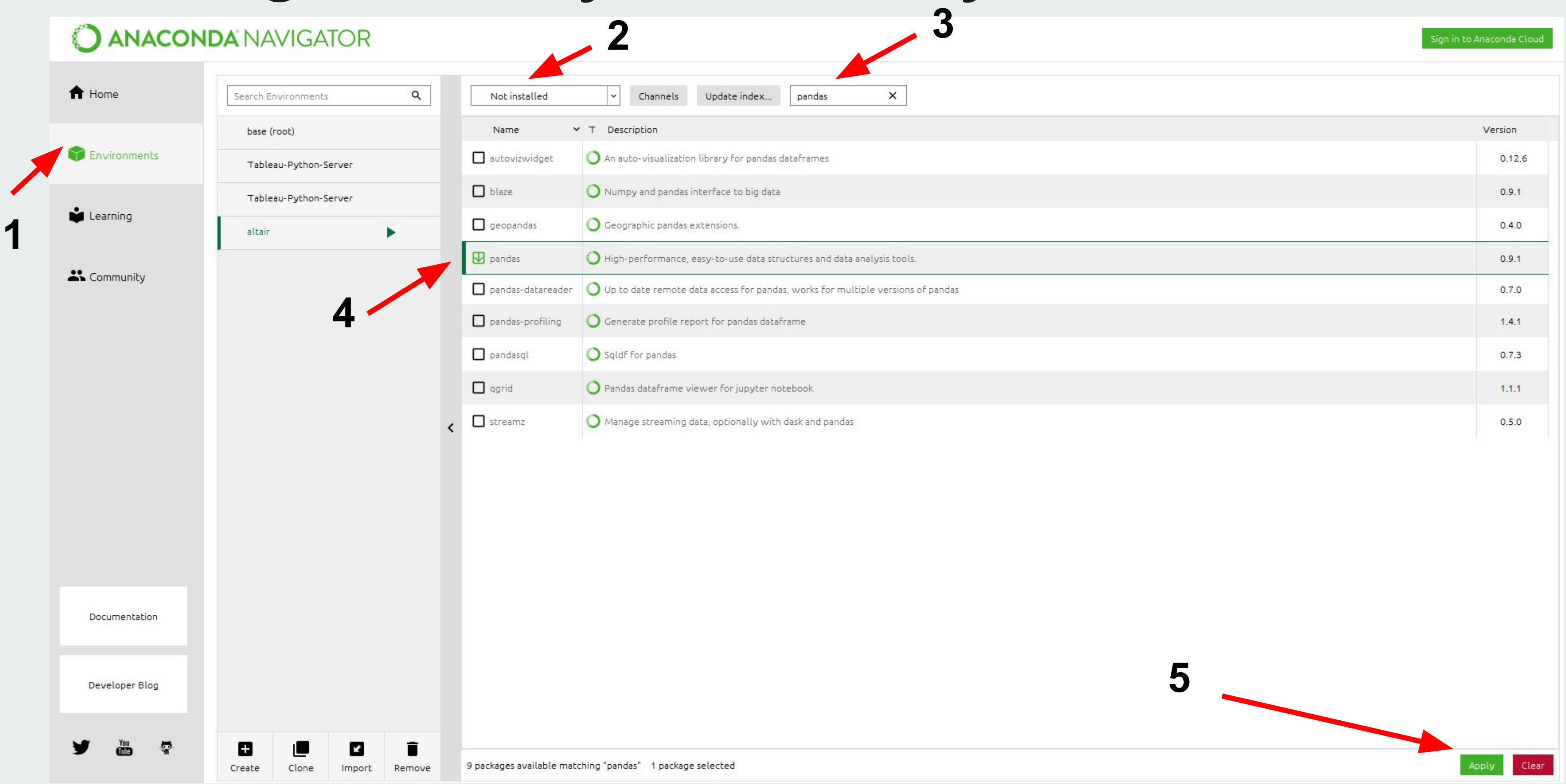
Exiting Spyder

- If you’re running spyder from your terminal or CMD, you can close the program by typing control+c
- If opened in Anaconda Navigator close by exiting the window

Adding a new Python library with Anaconda

- Using Anaconda Navigator - open the Navigator
- Click on Environments on the left bar
- Make sure the dropdown bar in the middle is not installed (or All)
- Type in the library you want to install
- Click the box on the library to install
- Click Apply in the button right corner

Adding a new Python library with Anaconda

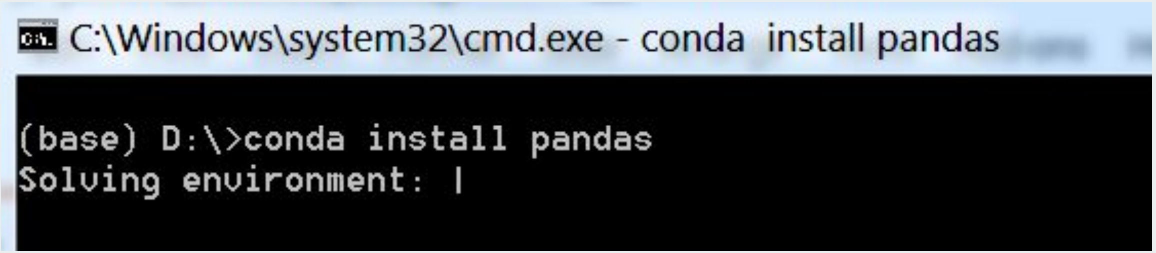


	Name	T	Description	Version
□	autovizwidget	○	An auto-visualization library for pandas dataframes	0.12.6
□	blaze	○	Numpy and pandas interface to big data	0.9.1
□	geopandas	○	Geographic pandas extensions.	0.4.0
☑	pandas	○	High-performance, easy-to-use data structures and data analysis tools.	0.9.1
□	pandas-datareader	○	Up to date remote data access for pandas, works for multiple versions of pandas	0.7.0
□	pandas-profiling	○	Generate profile report for pandas dataframe	1.4.1
□	pandasql	○	Sqldf for pandas	0.7.3
□	qgrid	○	Pandas dataframe viewer for jupyter notebook	1.1.1
□	streamz	○	Manage streaming data, optionally with dask and pandas	0.5.0

9 packages available matching "pandas"   1 package selected

Adding a new Python library with Anaconda

- Using Anaconda Prompt
- Type conda install <library name>
  - For example: conda install pandas



C:\Windows\system32\cmd.exe - conda install pandas

```
(base) D:\>conda install pandas
Solving environment: |
```

- After it finishes ‘Solving environment’ - hit ‘y’ to proceed

Questions?

Contact:

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denis@bds.group

Practice Problems

- Create a “Hello World” program in a Jupyter Notebook
- Create a “Hello World” program as a standalone .py script, and run it from the command line
- Modify the Jupyter Notebook version to ask the user to input their name, then say hello to them.