



Intro to Python

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What We'll Cover

LEARNING OBJECTIVES

- Ability to write and run Python scripts
- Ability to understand basic programming concepts
- Understanding of the possibilities opened up through a better understanding of Python

AGENDA

Time	Topic
60 min	Python Overview & Coding Exercises
10 min	Review and Q&A



What is Python?

- **Open source** programming language created by Guido Van Rossum and released in 1991
- Emphasizes code **readability** — meaning most anyone can read and **understand the code**
- Easier for many to contribute to **production level code**



Python and Open Source

Extensible with easy to install libraries

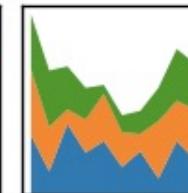
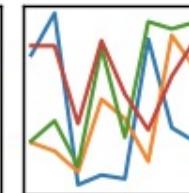
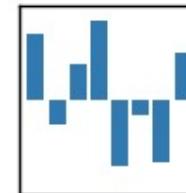
Great Documentation

Established and growing community



pandas

$$y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$$



What Makes Python Easy to Learn

- No headaches declaring types
- Simple syntax
- Elegant one liners
- English-like commands
- Intuitive data structures

Python

```
1 A = 10
2 B = 100
3 if A>B:
4     print("A is larger than B")
5 elif A==B:
6     print("A is equal to B")
7 else:
8     print("A is smaller than B")
```





Installing Jupyter

“

Indeed, we wrote much more code in python than we were expecting, including all in-game screens and the main interface.

Soren Johnson, lead designer on
Civilization IV, Firaxis Games

Install Anaconda

The screenshot shows the Anaconda download page for macOS. At the top, there are links for Windows, macOS, and Linux. The main content is titled "Anaconda 5.3 For macOS Installer". It displays two sections: "Python 3.7 version *" and "Python 2.7 version *". Each section has a green "Download" button with a downward arrow icon. Below each button are two download links: "64-Bit Graphical Installer (634 MB)" and "64-Bit Command-Line Installer (544 MB)". A red arrow points from the top left towards the "Python 3.7 version" section, and a red circle highlights this entire section.

Anaconda 5.3 For macOS Installer

Python 3.7 version *

Download

64-Bit Graphical Installer (634 MB) ⑦

64-Bit Command-Line Installer (544 MB) ⑦

Python 2.7 version *

Download

64-Bit Graphical Installer (628 MB) ⑦

64-Bit Command-Line Installer (539 MB) ⑦

*How to get Python 3.6 or other Python versions
How to Install ANACONDA





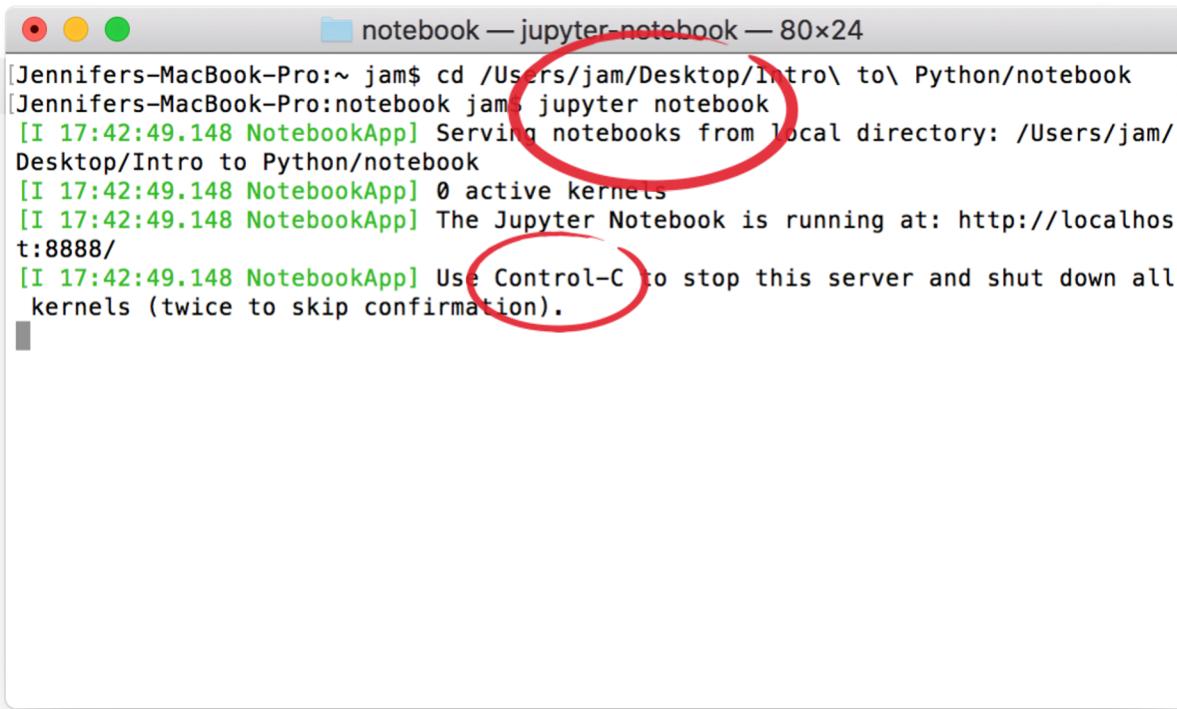
Running Jupyter

“

Indeed, we wrote much more code in python than we were expecting, including all in-game screens and the main interface.

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Launching Jupyter On A Mac



```
[Jennifers-MacBook-Pro:~ jam$ cd /Users/jam/Desktop/intro\ to\ Python/notebook ]  
[Jennifers-MacBook-Pro:notebook jam$ jupyter notebook ]  
[I 17:42:49.148 NotebookApp] Serving notebooks from local directory: /Users/jam/Desktop/intro to Python/notebook  
[I 17:42:49.148 NotebookApp] 0 active kernels  
[I 17:42:49.148 NotebookApp] The Jupyter Notebook is running at: http://localhost:8888/  
[I 17:42:49.148 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
```

MAC:

Open Terminal (**Applications > Utilities > Terminal**).

Type `jupyter notebook` and press **Enter**.

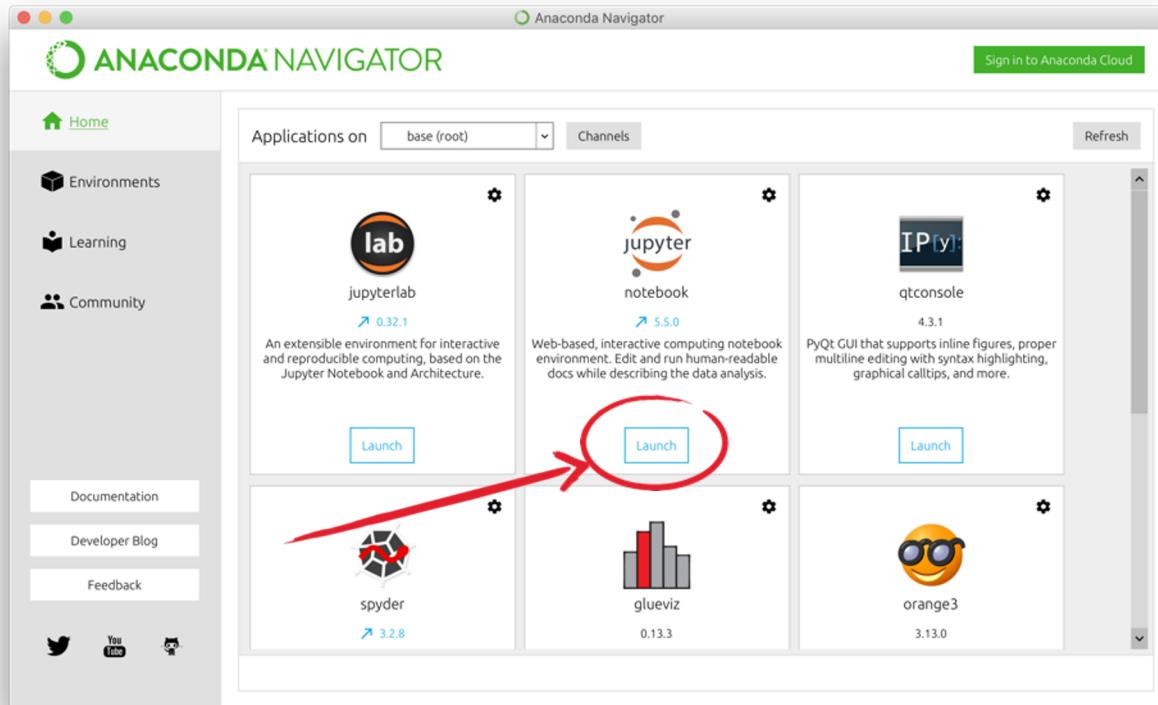
WINDOWS:

In the Start Menu, go to **Anaconda > Anaconda Prompt**.

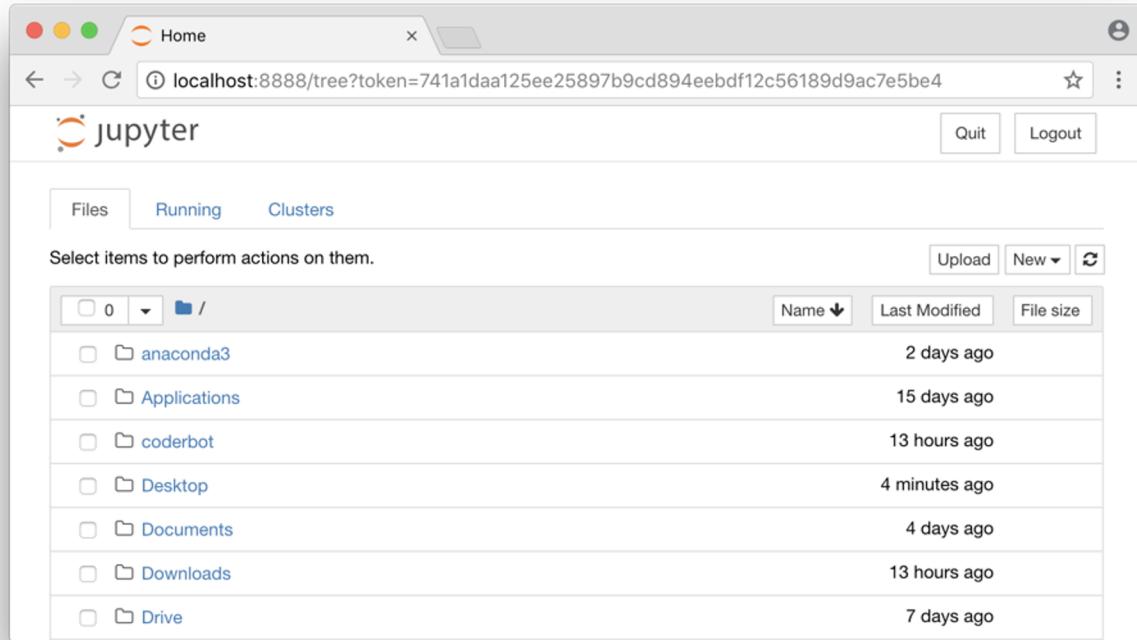
When the command prompt launches, type `jupyter notebook` and press **Enter**.



Launching Jupyter in Windows



Jupyter Launches in a New Browser Window



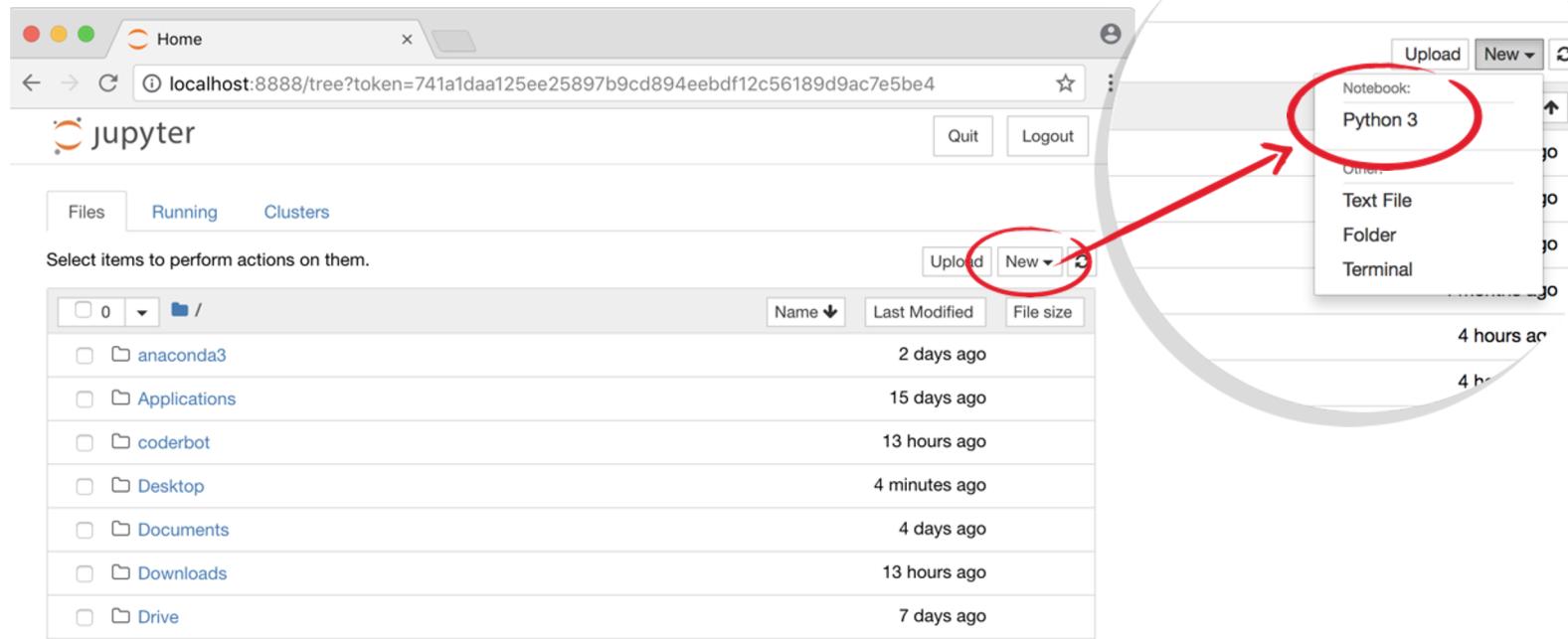
TIP **PASSWORD SETUP**

If prompted for a password, go back to the shell, type `jupyter notebook password` and press ENTER.

JUlia + PYThon + R



Creating Your First Notebook



Jupyter Notebook

- **Cells:**

- **Markdown** for notes
- **Code** for Python

- **Modes**

- **Blue** for commands
- **Green** for editing

- **Execution**

- Shift + return

- **Output**

- Print (all)
- Return values (last)

The screenshot shows a Jupyter Notebook interface with the title "jupyter Untitled". The top menu bar includes File, Edit, View, Insert, Cell, Kernel, Widgets, and Help. Below the menu is a toolbar with icons for file operations like save, new, and delete, and cell execution controls like Run, Kernel restart, and Cell copy/paste. A dropdown menu for "Markdown" is also present. The main workspace contains two code cells. The first cell, labeled "In [54]:", contains the expression `2+2`, which is evaluated to `Out[54]: 4`. The second cell, labeled "In [55]:", contains the code `print("hello")` followed by the addition expressions `2+2` and `3+3`. The output of this cell is `hello` followed by `Out[55]: 6`.

```
In [54]: 2+2
Out[54]: 4

In [55]: print("hello")
          2+2
          3+3

          hello
Out[55]: 6
```

Jupyter Notebook Errors

```
just some code
```

```
File "<ipython-input-56-2516a36d8922>", line 1  
    just some code  
          ^
```

```
SyntaxError: invalid syntax
```

- **What went wrong?**
- **How could we fix the problem?**



EXERCISE: Take Jupyter for a spin



6 Mins.

Get familiar with Jupyter by completing these tasks:

1. Create a new Notebook and name it Notebook Basics.
2. Add some markup to the first cell, documenting your notebook.
3. Add code to the second cell and execute it:

```
greeting = "Hello World"
print(greeting)
```
4. Try to do some math
5. Make an error, then fix it and rerun the cell.



HINTS

Click on the title to change it.

Insert a new cell using insert in the menu above the cells

Toggle between code and markdown in the menu next to the icons

Click in the cell, enter the code and press **SHIFT + ENTER**.

Click in the cell, type $2687+22$ and run the cell



Python Lesson, Coding Exercises, and Solutions

Open

intro_python_fundamentals_challenges_template.ipynb in
welcome-to-data-science

Programming Fundamentals Framework

The core components of Python.

- Syntax
 - The set of rules that define the combinations of symbols that are considered to be correctly structured programs in that language.
- Variables
 - How computers store information
- Control Structures
 - Sets the hierarchy/priorities of programming logic
- Data Structures
 - How computers store and organize data



Go Further

What's next?

Solidify your learning:

- Go through the parts of [Learn How to Think Like a Computer Scientist](#).
- Familiarize yourself with the language by going through [A Beginner's Python Tutorial](#).

Practice Practice Practice! Problems to expand your skills are available at:

- [HackerRank](#)
- [CodeWars](#)



Introduced = Python+You