

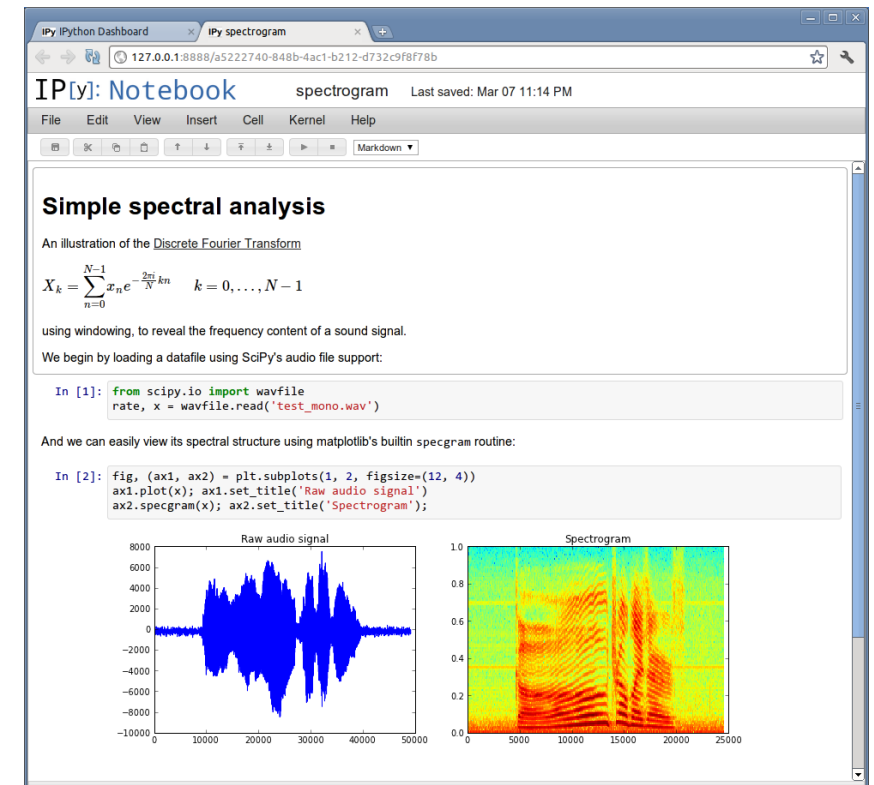
Introduction to Jupyter Notebook

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Jupyter Notebook



- Improvement from iPython Notebook which was launched in 2011
- iPython Notebook has the following features:
 - Rich web client
 - Text & math
 - Code
 - Results
 - Share, reproduce.

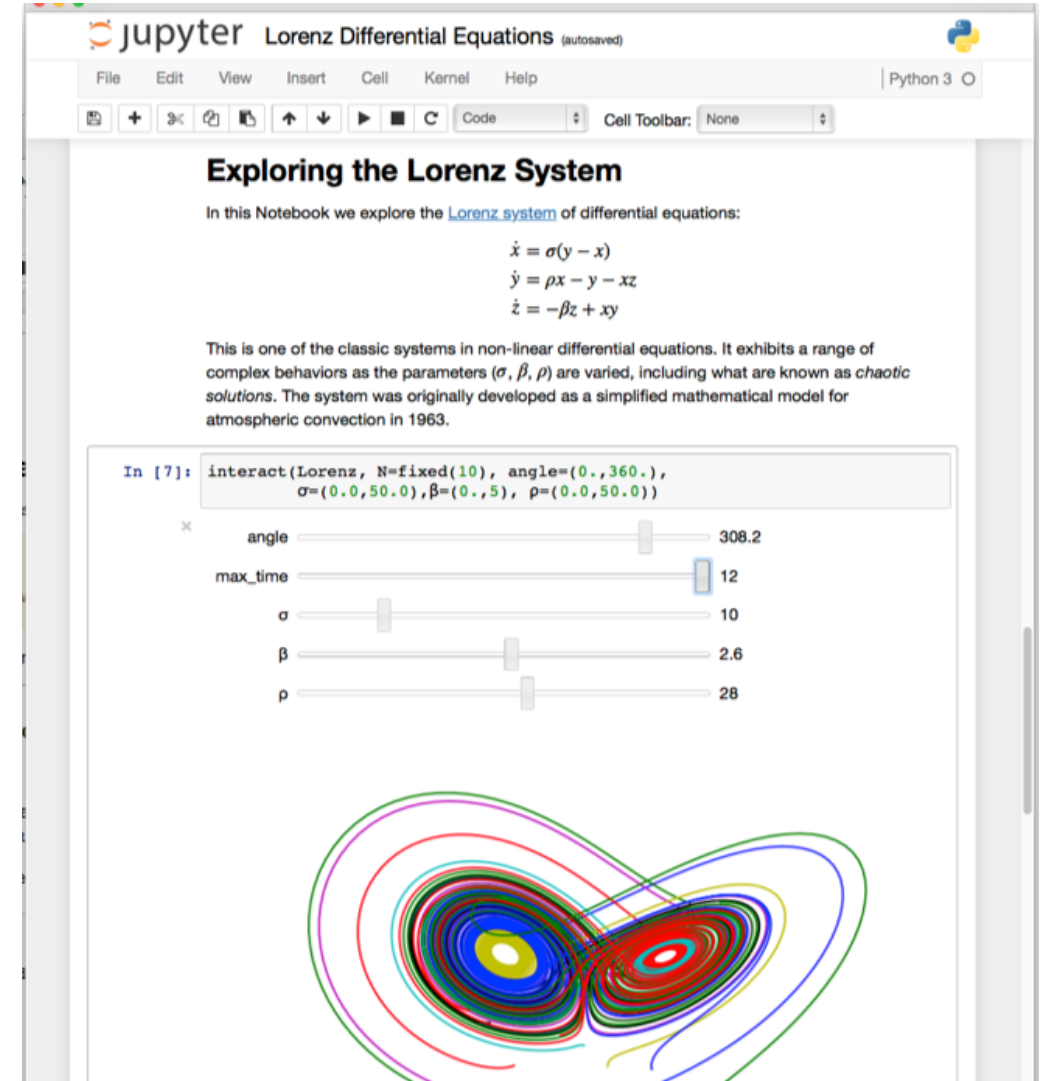


Jupyter vs iPython

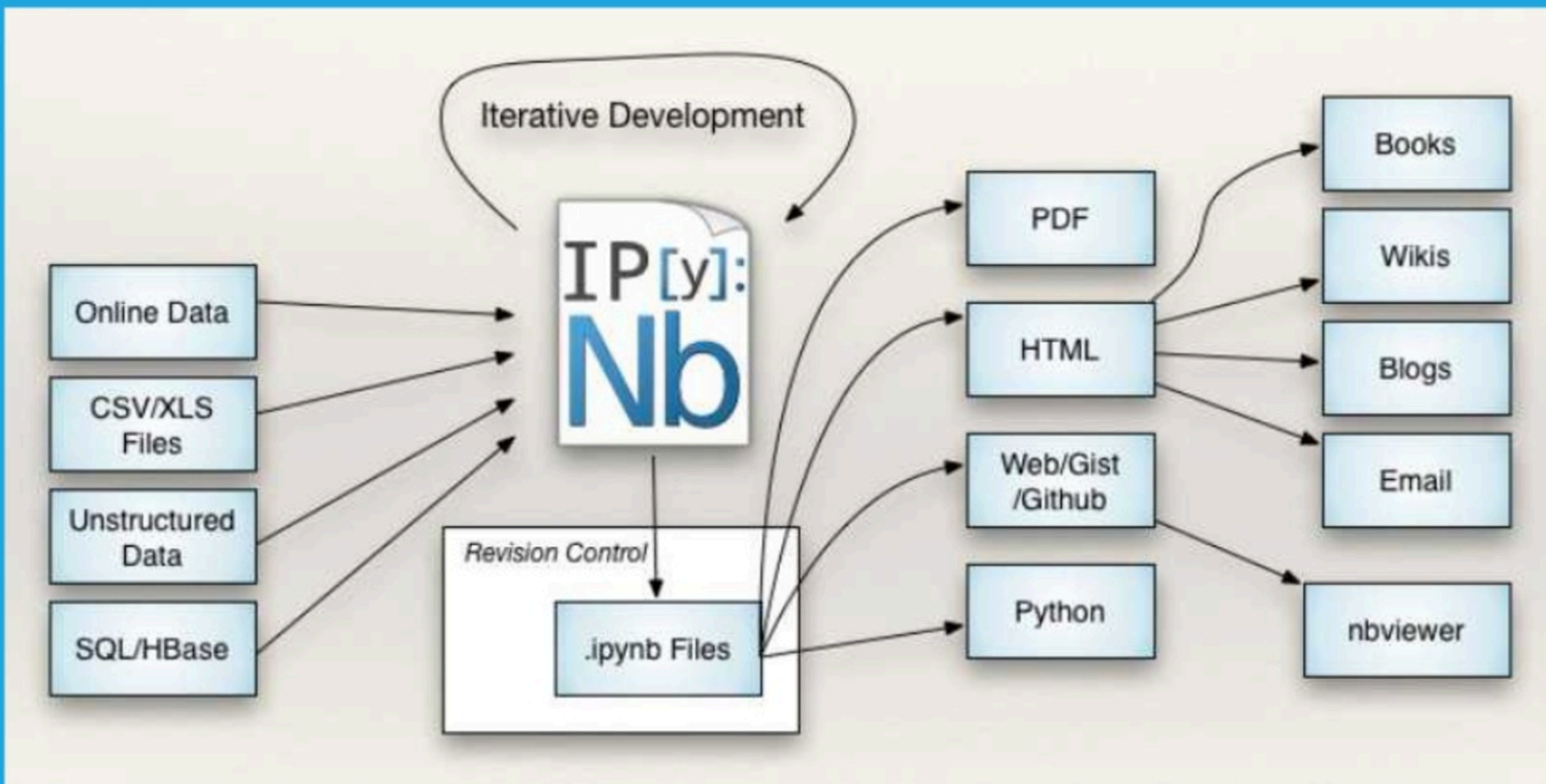
- Network protocol for interactive computing
- Clients for protocol
 - Console
 - Qt Console
 - Notebook
- Notebook file format & tools (nbconvert...)
- JupyterHub
- Nbviewer
- NbGrader
- Tmpnb
- Interactive Python shell at the terminal
- Kernel for this protocol in Python
- Tools for Cross-Language integration
- Tools for Interactive Parallel computing
- The “reference” kernel for Jupyter

Jupyter Notebook

- Demo: Try it on <https://try.jupyter.org>
- To launch:
 - From your terminal: `> jupyter notebook`
- Web Application, that allow code to produce web-rich representation (images, sound, video, math, ...)
- The Browser, Server, and kernel(s) can be on separate machines.
- The default application to edit `.ipynb`` files.
- `.ipynb`` file are JSON based files embedding input and output, so which can be read & converted without a running kernel.



Notebook Workflows



Useful commands

- The **four most helpful commands**, as well as their brief description, is shown to you in a banner, every time you start IPython:

command	description
?	Introduction and overview of IPython's features.
%quickref	Quick reference.
help	Python's own help system.
object?	Details about 'object', use 'object??' for extra details.

Magic functions

- IPython has a set of predefined ‘magic functions’ that you can call with a command line style syntax
- Line magic: prefixed with the `%` character and work much like OS command-line calls
- Cell magic: prefixed with a double `%%`, and they are functions that get as an argument not only the rest of the line, but also the lines below it in a separate argument.

```
In [1]: %timeit range(1000)
100000 loops, best of 3: 7.76 us per loop

In [2]: %%timeit x = range(10000)
...: max(x)
...:
1000 loops, best of 3: 223 us per loop
```

Keyboard shortcuts

Command Mode (press Esc to enable)	
Enter	enter edit mode
Shift-Enter	run cell, select below
Ctrl-Enter	run cell
Alt-Enter	run cell, insert below
Y	to code
M	to markdown
R	to raw
1	to heading 1
2,3,4,5,6	to heading 2,3,4,5,6
Up/K	select cell above
Down/J	select cell below
A/B	insert cell above/below
X	cut selected cell
C	copy selected cell
Shift-V	paste cell above
V	paste cell below
Z	undo last cell deletion
D,D	delete selected cell
Shift-M	merge cell below
Ctrl-S	Save and Checkpoint
L	toggle line numbers
O	toggle output
Shift-O	toggle output scrolling
Esc	close pager
H	show keyboard shortcut help dialog
I,I	interrupt kernel
O,O	restart kernel
Space	scroll down
Shift-Space	scroll up
Shift	ignore

Edit Mode (press Enter to enable)	
Tab	code completion or indent
Shift-Tab	tooltip
Ctrl-]	indent
Ctrl-[dedent
Ctrl-A	select all
Ctrl-Z	undo
Ctrl-Shift-Z	redo
Ctrl-Y	redo
Ctrl-Home	go to cell start
Ctrl-Up	go to cell start
Ctrl-End	go to cell end
Ctrl-Down	go to cell end
Ctrl-Left	go one word left
Ctrl-Right	go one word right
Ctrl-Backspace	delete word before
Ctrl-Delete	delete word after
Esc	command mode
Ctrl-M	command mode
Shift-Enter	run cell, select below
Ctrl-Enter	run cell
Alt-Enter	run cell, insert below
Ctrl-Shift-Subtract	split cell
Ctrl-Shift--	split cell
Ctrl-S	Save and Checkpoint
Up	move cursor up or previous cell
Down	move cursor down or next cell
Ctrl-/	toggle comment on current or selected lines