Jupyter widgets

From Slider to Virtual Reality

By Maarten Breddels

Joy of Coding 2018 - Rotterdam - June 8

I am an

- Ex: astronomer (working on software for big data: vaex)
- Now: Freelancer / consultant / data scientist for Python / Jupyter
- Like: Python, Javascript, C(++), Java, Clojure(Script)
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The agenda:

1. Small Jupyter introduction

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2. Why Jupyter widgets

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1.
What is Project Jupyter?

“Project Jupyter exists to develop **open-source software**, open-standards, and services for **interactive computing** across **dozens of programming languages**.”

What is project Jupyter?

Jupyter notebook

- JSON file with code, text, images
- Can be rendered as HTML, PDF..
- ‘Editor’ is the Browser+Notebook server/Jupyter Lab
- Language independent!

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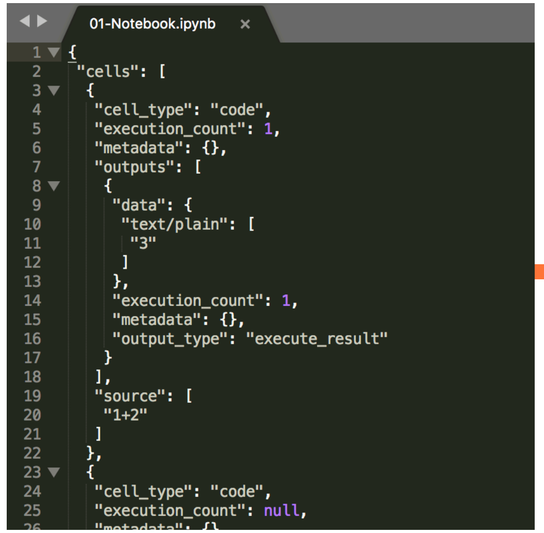

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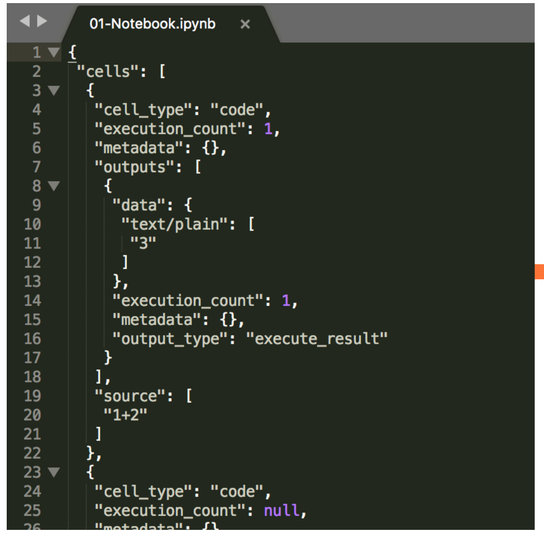

Notebook server / Jupyter Lab

- Hosts the notebook (open/save)
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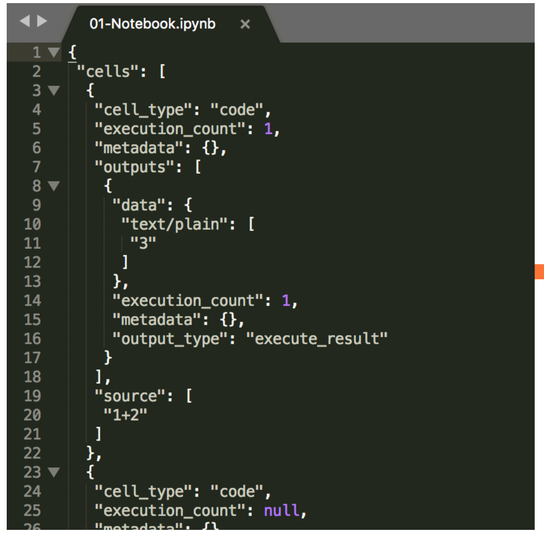

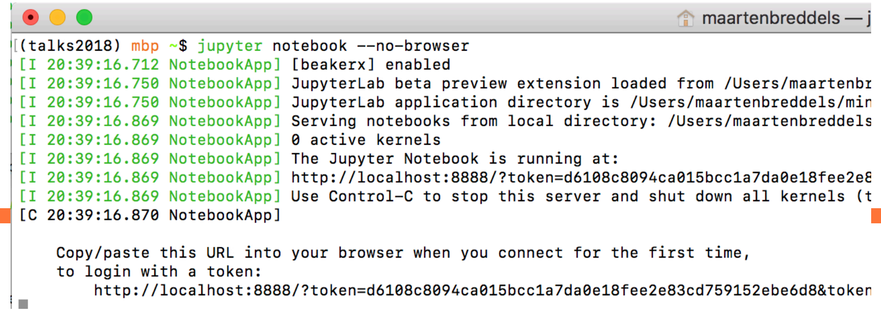

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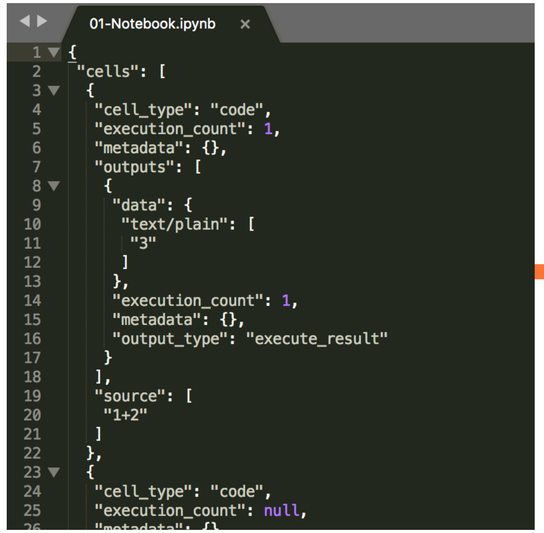
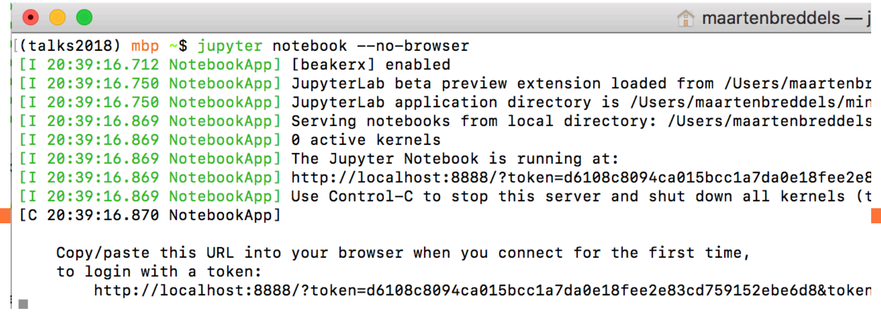
- This talk
- Interactive elements in the notebook
- Mostly written in Javascript
- Language binding is mostly boilerplate





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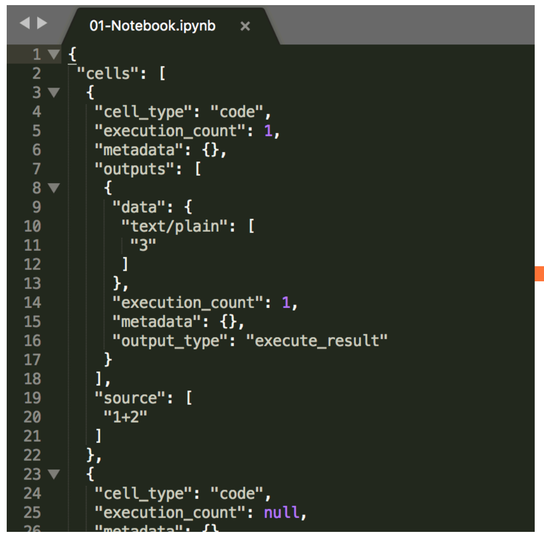

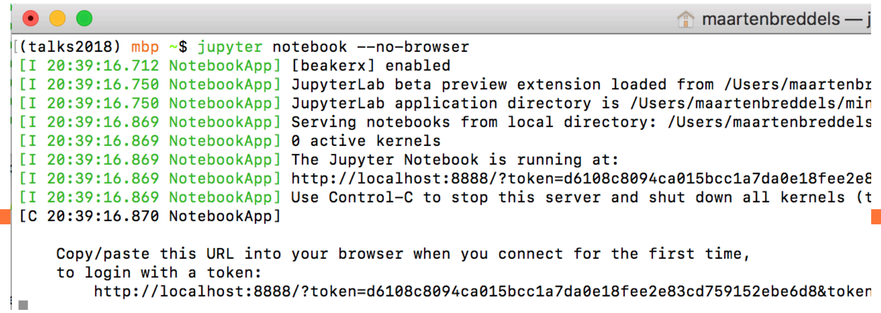

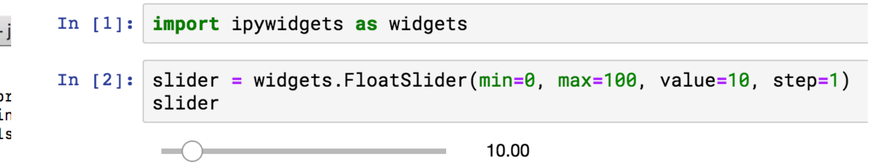

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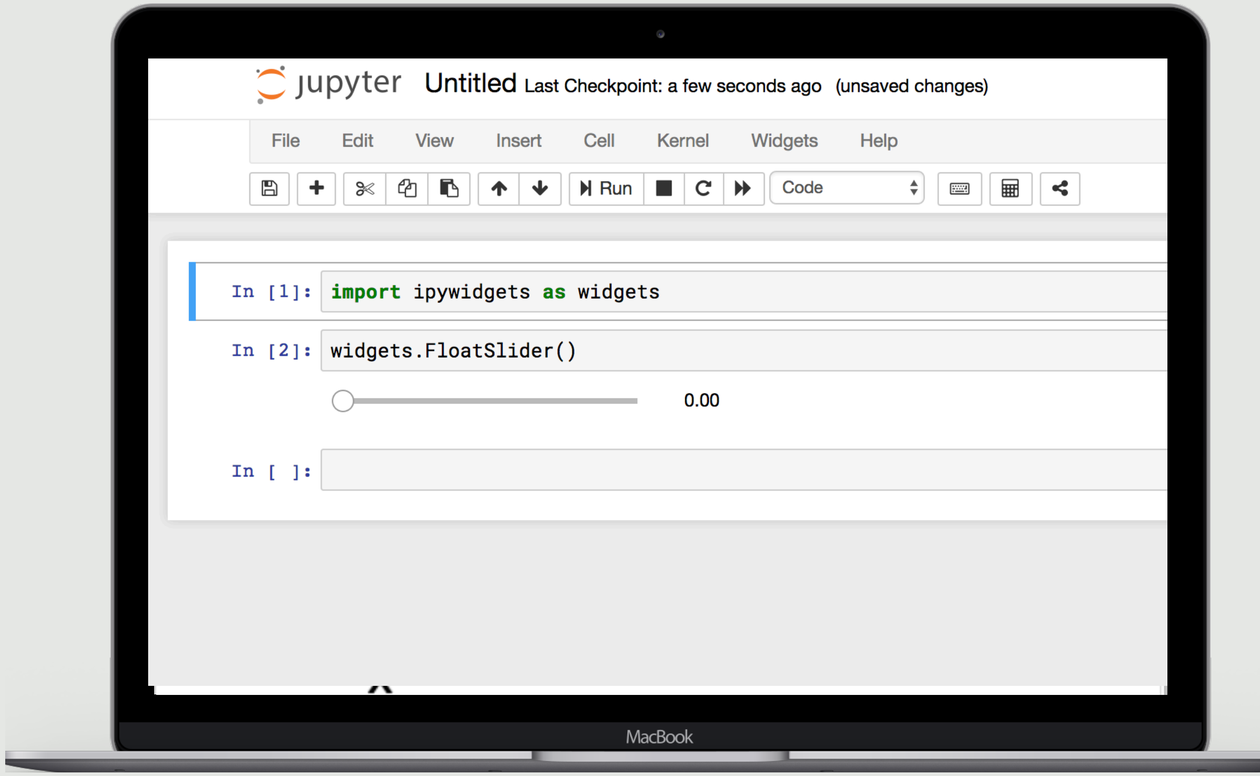
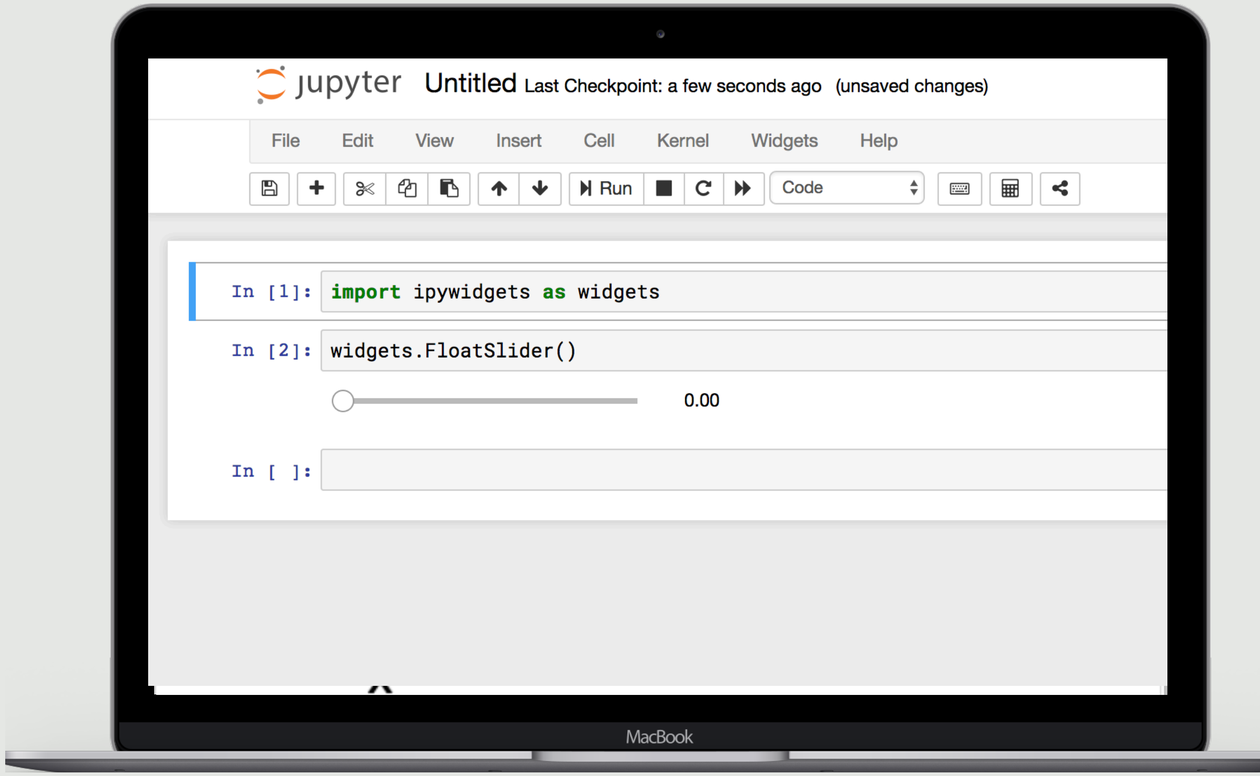


Why Jupyter widgets?

- Make your code interactive



Why Jupyter widgets?

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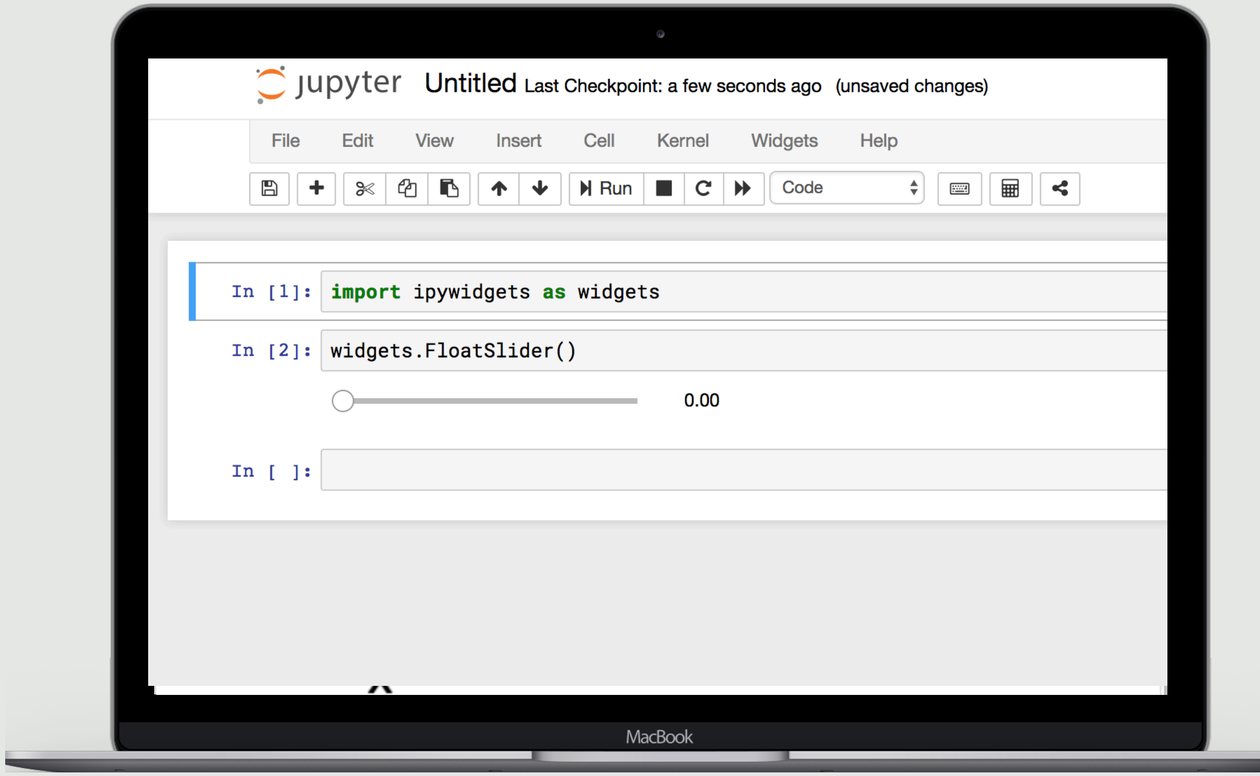

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- Make your code interactive
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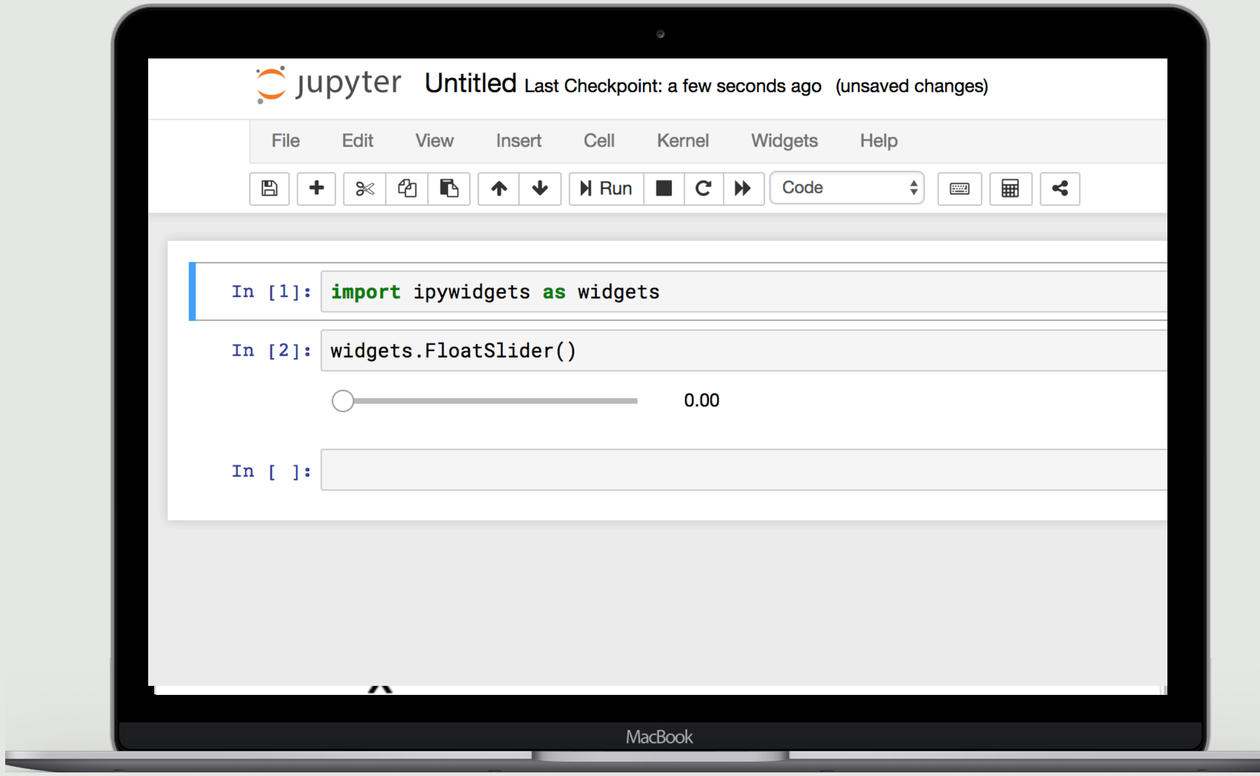

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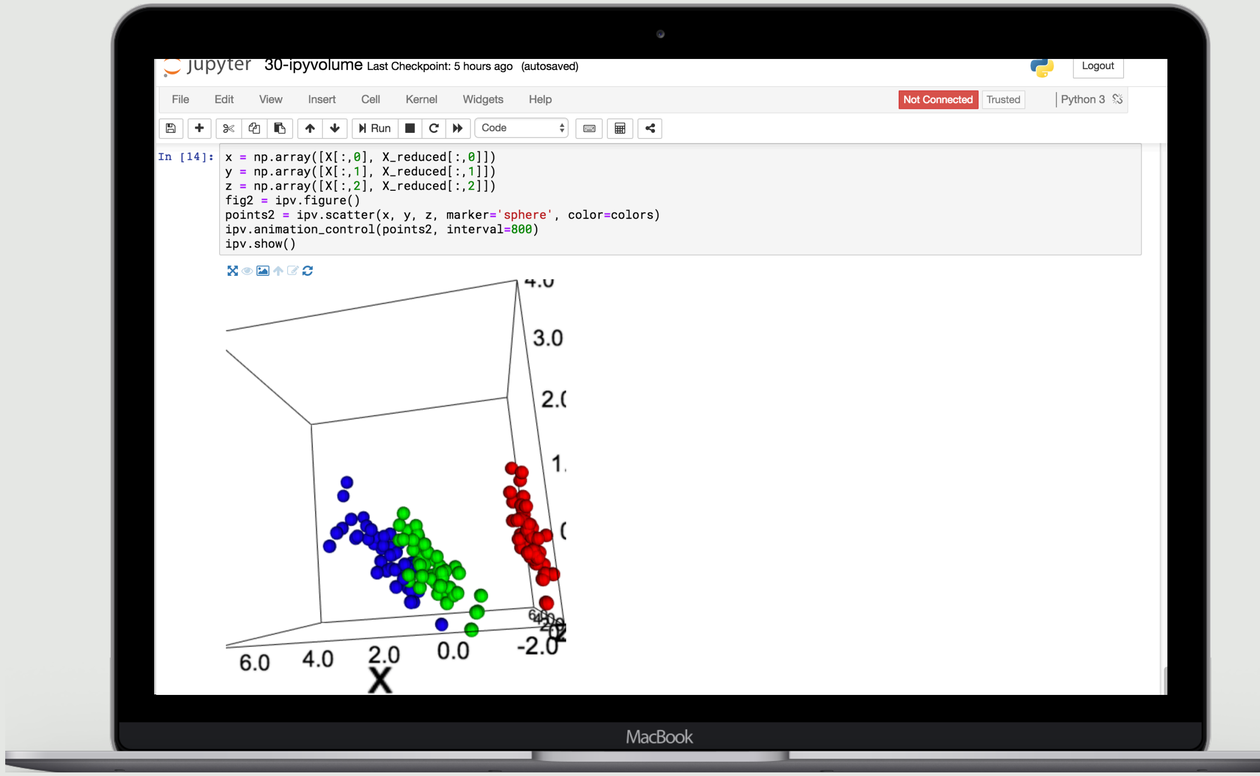

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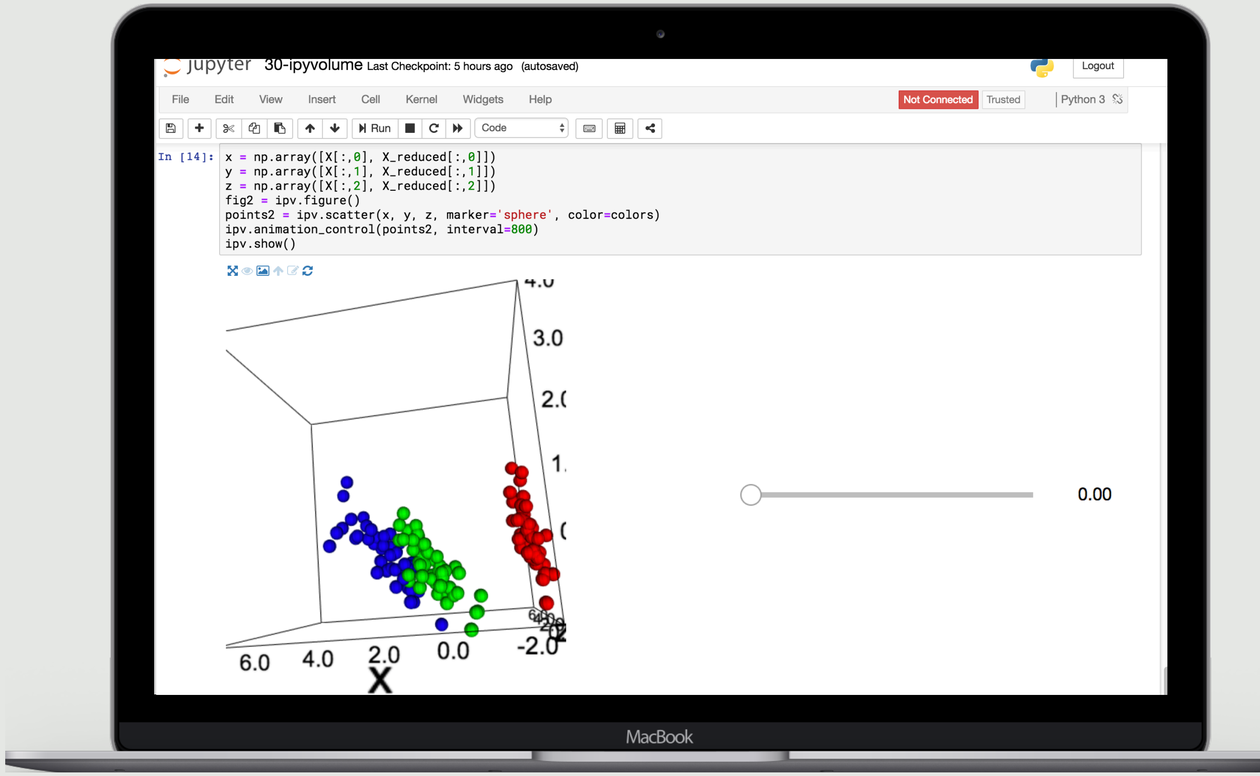

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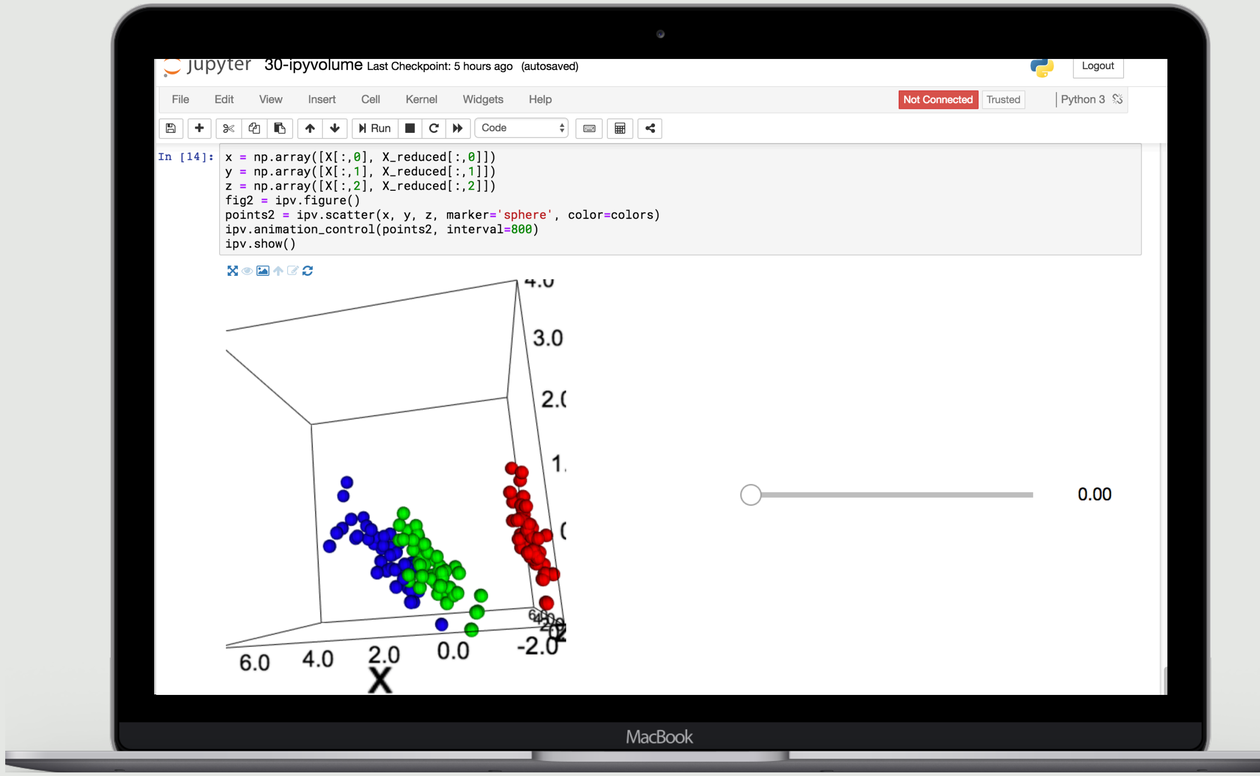
- Easy to add to new languages



Less libraries

	Python
Basic widgets	ipywidgets
2d plotting	bqplot
3d plotting	ipyvolume
Geo maps	ipyleaflet

Less libraries

	Python	C++
Basic widgets	ipywidgets	xwidgets
2d plotting	bqplot	xplot
3d plotting	ipyvolume	xvolume
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	Python	C++	Clojure
Basic widgets	ipywidgets	xwidgets	beakerx
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Demo time:

“Never do a live demo”

-Many people

Library scaling

Libraries

- ipywidgets *(jupyter widgets)*
- ipyvolume *(ipyvolume)*
- pythreejs *(jupyter-threejs)*
- ipyleaflet *(jupyter-leaflet)*
- ipysheet *(jupyter-sheet)*
- bqplot *(bqplot)*
- ipywebrtc *(jupyter-webrtc)*
- ipytrack *(jupyter-track)*

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Languages

- Python
- JVM
  - Java
  - Scala
  - Clojure
  - Kotlin
  - Groovy
- C++
- R?

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#Jupyter widgets libraries < #Libraries x #Languages

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More information

- Medium: ‘Authoring Custom Jupyter Widgets’
  - https://blog.jupyter.org/authoring-custom-jupyter-widgets-2884a462e724
- https://github.com/jupyter-widgets/
- https://github.com/jupyter-widgets/ipywidgets/
- https://ipywidgets.readthedocs.io/
- https://gitter.im/jupyter-widgets/Lobby
- https://github.com/jupyter-widgets/widget-cookiecutter
- https://github.com/jupyter-widgets/widget-ts-cookiecutter
- https://github.com/vidartf/widget-gen

- source: github.com/maartenbreddels/joyofcoding2018
- binder: joy.maartenbreddels.com

THANKS!

ANY QUESTIONS?

You can find me at

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