

A Brief History of Jupyter Notebooks

...

William Horton

Two different worlds of Python

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit <https://support.apple.com/kb/HT208050>.

```
Williams-MBP:hello williams$ source /Users/william/anaconda/bin/activate  
conda activate base  
(base) Williams-MBP:hello williams$ conda activate base  
(base) Williams-MBP:hello williams$ /Users/william/anaconda/bin/python  
Python 3.6.8 |Anaconda custom (64-bit)| (default, Dec 29 2018, 19:04:46)  
[GCC 4.2.1 Compatible Clang 4.0.1 (tags/RELEASE_401/final) on darwin  
Type "help", "copyright", "credits" or "license" for more information.  
>>> print("hello, world!")  
hello, world!  
>>>
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE 1: Python

EXPLORER OPEN EDITORS 1 UNSAVED hello.py — hello

hello.py

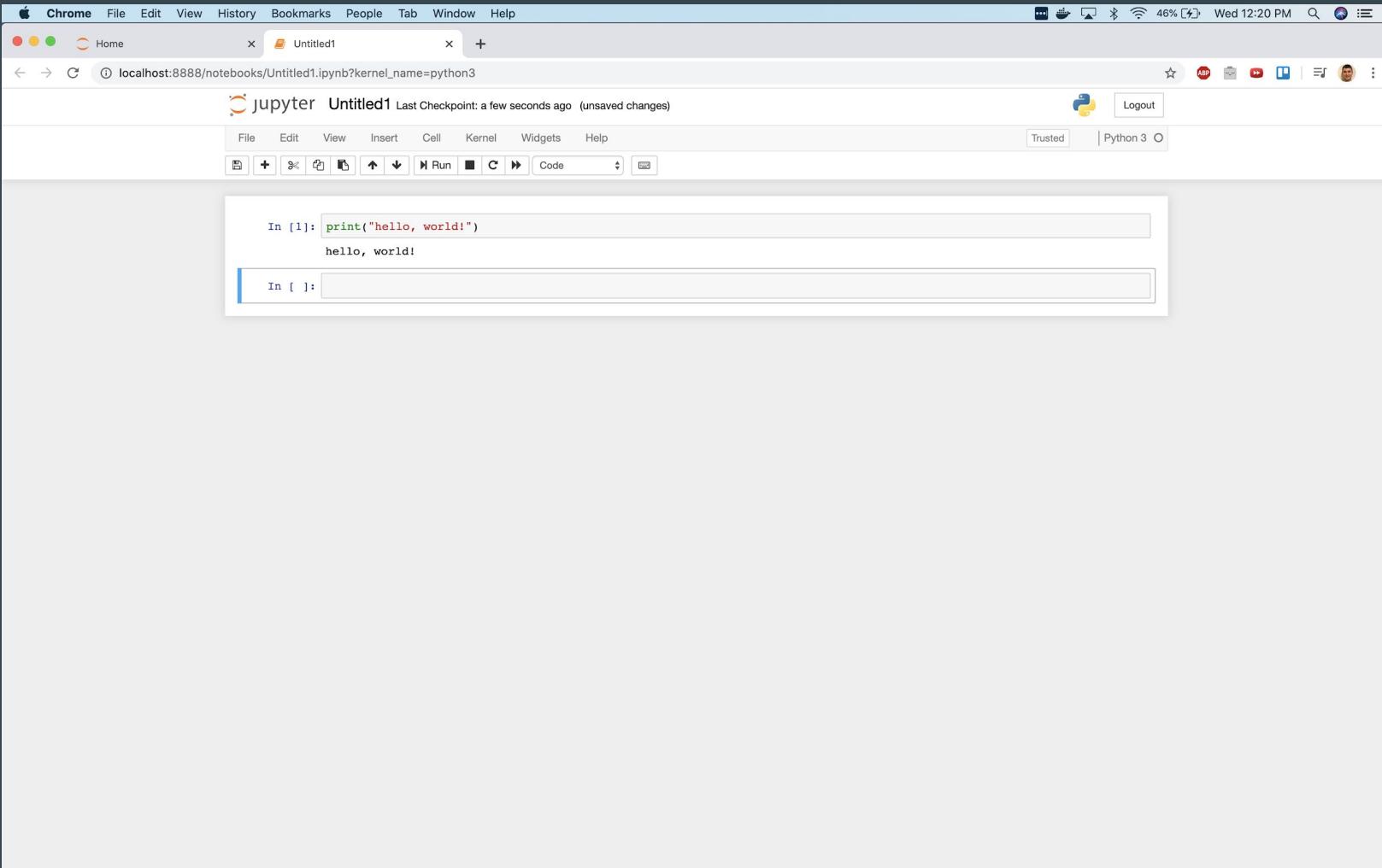
HELLO

hello.py

OUTLINE TIMELINE

Python 3.6.8 64-bit (base: conda) ⚡ 0 △ 0

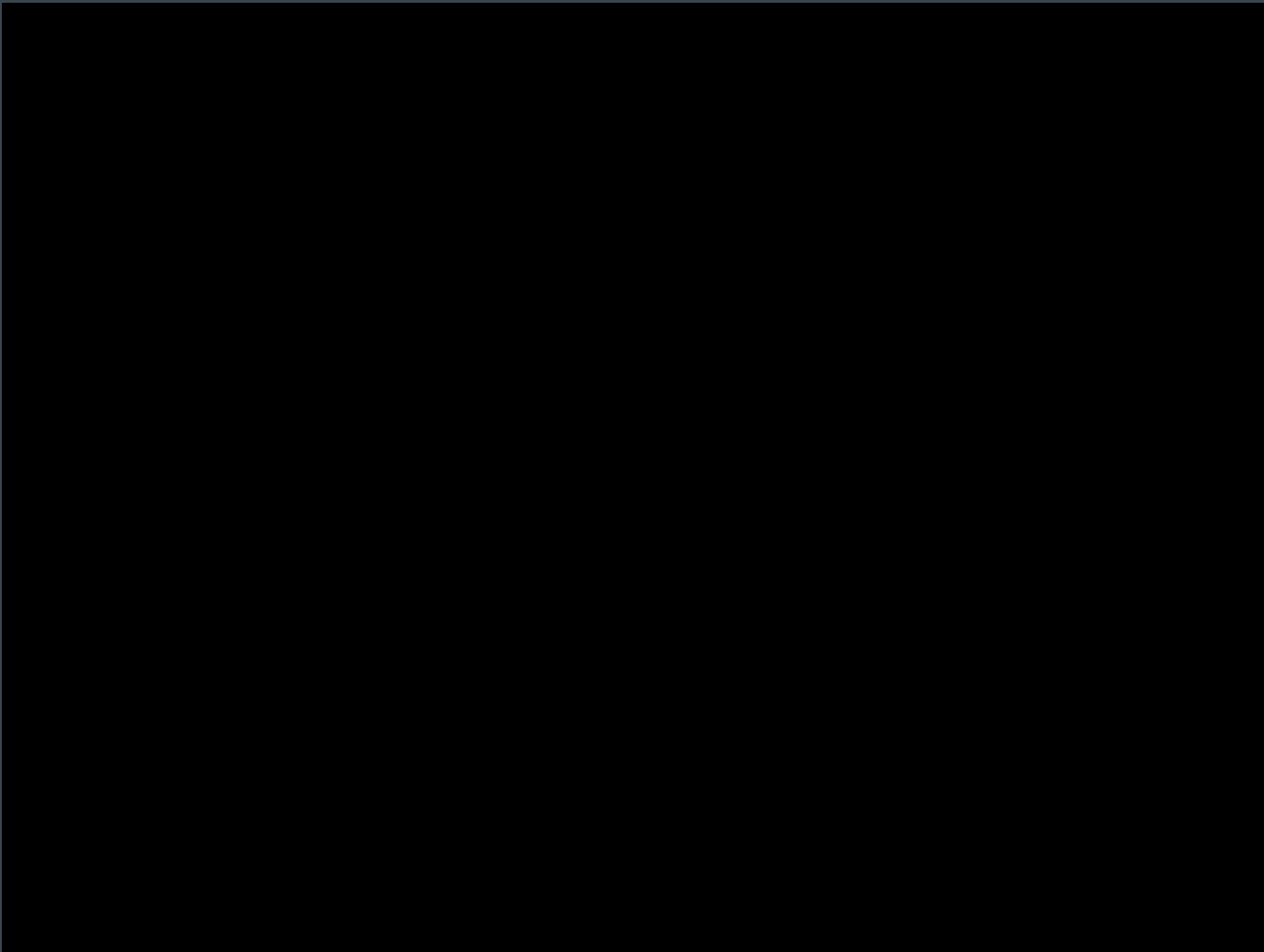
Ln 1, Col 23 Spaces: 4 UTF-8 LF Python ⚡





jupyter Untitled1

What is a Jupyter Notebook?



Why?

My personal journey



Jeremy #Masks4All Howard

@jeremyhoward

I do think Mathematica doesn't get the credit it deserves for pioneering notebooks

news.ycombinator.com/item?id=2227888

williamstein 2 hours ago | unvote | parent | flag | favorite | on: Colab Pro

Mathematica's notebook definitely strongly inspired Colab's notebook. Colab is an implementation of the Jupyter notebook format and UI. Jupyter, which launched around 2011, itself was strongly inspired by (1) the IPython console from around 2003, and (2) the Sage Notebook which I launched around 2006.

I can tell you definitively that Sage Notebook is very Mathematica inspired. The IPython console looked a lot like Mathematica, mainly because Fernando Perez (who was a physicist) had used Mathematica a lot and wanted something similar but (much) better. In 2005 there was a project to make an IPython notebook interface as an OS X graphical application, which got demoed at Sage Day 1 (in Feb 2006). That motivated me to get interested in doing something similar, but using Javascript and HTML instead. I hired Alex Clemesha, who just finished his physics undergrad and was a *heavy* Mathematica user to work on Sage fulltime. He did a lot of work with me during 2006 to create a web-based notebook interface (and also to provide a mathematica-like graphics compatibility layer for Python, which is in Sage). The Sage notebook felt pretty similar in 2007 to what Jupyter notebook feels like, and it definitely inspired the UI. We developed Sage notebook heavily and then all sort of lost interest and moved on to other things (e.g., Jason Grout, who was involved a lot with the Sage notebook went to work at Bloomberg, where he did a massive amount of work on JupyterLab). Fortunately, Fernando Perez and others got incredible grant support and many fantastic engineers together built the Jupyter notebook. Jupyter notebook provided the same sort of cell/output UI as we had with the Sage notebook, but was much more general purpose (many kernels) and used more "modern" implementation techniques, by 2011 standards at least.

There's a lot of amazing things about the Mathematica notebook that we never even tried to implement. For example, Mathematica has a much more sophisticated nested structure. Also, by default Mathematica shares one kernel across multiple notebooks (or at least it did last time I tried it).

8:01 PM · Feb 8, 2020 · Twitter Web App

Jupyter Notebooks go mainstream

The screenshot shows a news article from The Atlantic. At the top, there's a navigation bar with a logo, a search icon, and links for 'Popular' and 'Latest'. The main title 'The Atlantic' is centered above a large image of a burning document. Below the title, the word 'TOOLBOX' and the date '30 OCTOBER 2018' are visible. The main headline reads 'Why Jupyter is data scientists' computational notebook of choice'. A subtext below it says 'An improved architecture and enthusiastic user base are driving uptake of the open-source web tool.' The author's name, Jeffrey M. Perkel, is listed. The article discusses the use of Jupyter notebooks in archaeology, mentioning the work of Krishna R. Veeramah et al. at the University of Mainz. It includes a quote from Eske Willerslev and a note about the approval of the paper. The bottom of the page features a sidebar with the text 'The Scientific Paper is Obsolete' and 'Here's what's next.', followed by a section titled 'Population biology' and a reference to PNAS.

The Atlantic

Sign In Subscribe

TOOLBOX · 30 OCTOBER 2018

Why Jupyter is data scientists' computational notebook of choice

An improved architecture and enthusiastic user base are driving uptake of the open-source web tool.

Jeffrey M. Perkel

Edited by Eske Willerslev, University of Copenhagen, Copenhagen, Denmark, and approved January 30, 2018 (received for review November 21, 2017)

The Scientific Paper is Obsolete

Here's what's next.

Modern European genetic structure demonstrates strong correlations with geography, while genetic analysis of prehistoric human remains from around the continent during periods of cultural change has been sparse. Therefore, we generated genomic data that could shed light on the demographic processes occurring during the intervening period. We analyzed 41 individuals dating mostly to the late 5th/early 6th century AD from present-day Bavaria in southern Germany, including 11 whole genomes (mean depth 5.56x). In addition we developed

to form in the 5th century AD, and that it emanated from a combination of the romanized local population of the border province of the former Roman Empire and immigrants from north of the Danube (2). While the Baiuvarii are less well known than some other contemporary groups, an interesting archaeological feature in Bavaria from this period is the presence of skeletons with artificially deformed or elongated skulls (Fig. 1A).

Artificial cranial deformation (ACD), which is only possible during early childhood, is a deliberate and permanent shaping of the head performed with great effort. In some societies reshaping

POPULATION BIOLOGY

PNAS / Rich

Story by James Somers

APRIL 5, 2018 | SCIENCE

This talk:

I. Past

II. Present

III. Future

What this talk is not about

How to use Jupyter Notebooks

Introductory material for Jupyter notebooks



The illustration shows a person with blonde hair sitting on a green couch, reading a book. To their right is a desk with a computer monitor displaying the Python logo. Above the monitor hangs a framed picture of the R logo. To the right of the monitor is a large, colorful representation of a Jupyter Notebook interface, showing various cells and icons. The background is a light purple color.

Jupyter Notebook: An Introduction

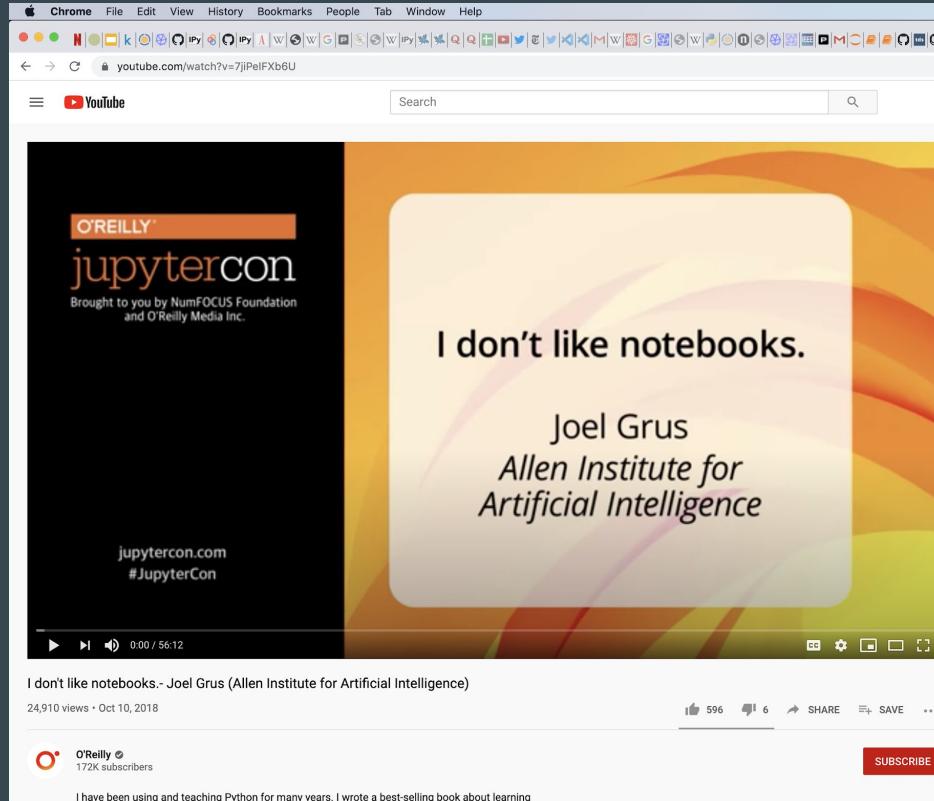
by Mike Driscoll 5 Comments ⚒ intermediate tools

[Tweet](#) [Share](#) [Email](#)

<https://realpython.com/jupyter-notebook-introduction/>

Loving or Hating Jupyter Notebooks

Joel Grus



The First Notebook War



<https://www.youtube.com/watch?v=QR7gR3njNWw>

Past

(Apologies to all the former science Ph.D's out
there)





factor x^3+2x^2+x+2



Σ Extended Keyboard

Upload

Examples

Random

Input interpretation:

factor

$$x^3 + 2x^2 + x + 2$$

Result:

$$(x + 2)(x^2 + 1)$$

Step-by-step solution

Plots:

Mathematica (1988)

Created by Stephen Wolfram

Notebook interface designed by Theodore Gray

An all-in-one system: language (Wolfram), execution environment, scientific libraries

THE BYTE AWARDS

The First Annual BYTE Award Winners



In the course of a year, we see a lot of products at BYTE—the good, the bad, the ugly, the innovative, the inane, and the endles...

Mathematica

Mathematica is another breakthrough Macintosh application. It does for students of calculus, symbolic algebra, and some discrete mathematics what calculators did for those learning arithmetic. Confirmed mathphobic stu-

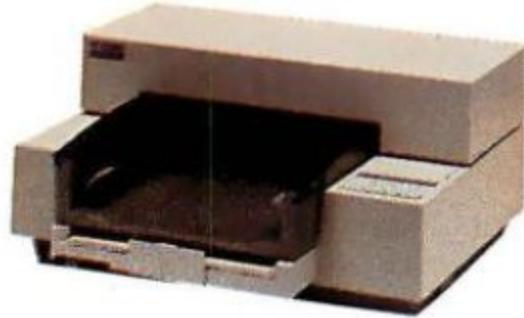
dents may very well be drawn into Mathematica's impressive displays and its ability to solve equations quickly and display graphical results. It could enable you to absorb the algebra and calculus that seemed impossible to comprehend from a textbook.

EXCELLENCE



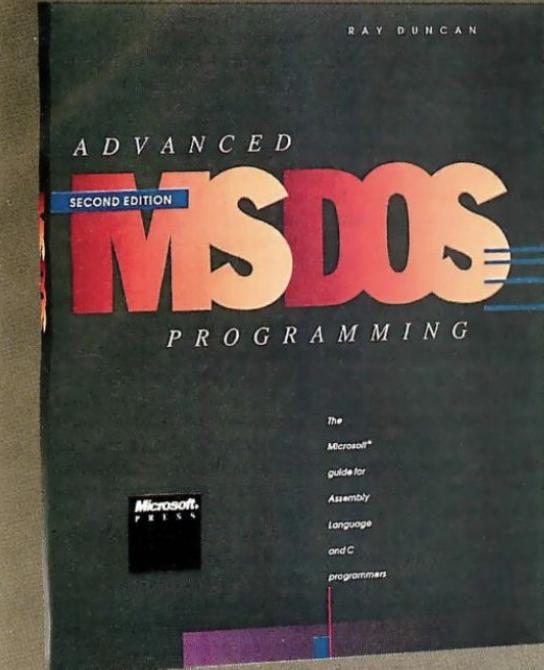
NeXT Computer

The NeXT Computer shows what can be done when a personal computer is designed as a system, and not a collection of hardware elements. It features the latest-generation high-speed components: Motorola's 25-MHz 68030 CPU and 68882 floating-point unit, and a 4-megabyte-per-second SCSI (small computer system



HP DeskJet Printer ▲
If you're looking for a truly silent printer, this HP ink-jet will suit you. The DeskJet's output is close to laser-printer quality at a much more tolerable price of \$995. It comes

We couldn't have said it better.



"Advanced MS-DOS PROGRAMMING exemplifies how a highly technical book can be both informative and readable.... Duncan's strengths include a style that is at once easily read, a thorough coverage of the subject matter heretofore unknown, and the frequent use of examples in the form of assembly language programs and code fragments."

BYTE magazine
John Unger, IBM Issue 1986

"Makes good reading out of even the most elaborate technical descriptions."

Online Today

"One of the most authoritative in its field.... The book deserves a place on the shelf of everyone who has ever given a fleeting thought to programming the IBM PC and compatibles."

PC Magazine

Key architectural details of Mathematica Notebooks

Two parts to the system: kernel and front-end

The front-end sends the input to the kernel, which returns the result, which is displayed

Mathematica notebooks are objects that can be manipulated by Mathematica programs

The Mathematica Notebook Interface

MathematicaTM

ALGEBRAIC COMPUTATIONS

```
In[1]:= Series[Exp[f[x + h] - f[x - h]], {h, 0, 6}]
```

```
Out[1]=
```

$$1 + 2 f'[x] h + 2 f'[x] \frac{h^2}{2} +$$
$$\left(\frac{4 f''[x]}{3} + \frac{f^{(3)}[x]}{3} \right) h^3 +$$
$$\left(\frac{2 f''[x]^2}{3} + \frac{2 f'[x] f^{(3)}[x]}{3} \right) h^4 +$$
$$\left(\frac{4 f''[x]^5}{15} + \frac{2 f''[x]^2 f^{(3)}[x]}{3} + \frac{f^{(5)}[x]}{60} \right) h^5 +$$
$$\left(\frac{f^{(3)}[x]^2}{9} + \frac{f''[x] f^{(5)}[x]}{15} \right) h^6 + \frac{4 f'[x]^6}{45} +$$
$$\frac{4 f''[x]^3 f^{(3)}[x]}{9} h^7 + O[h]^7$$

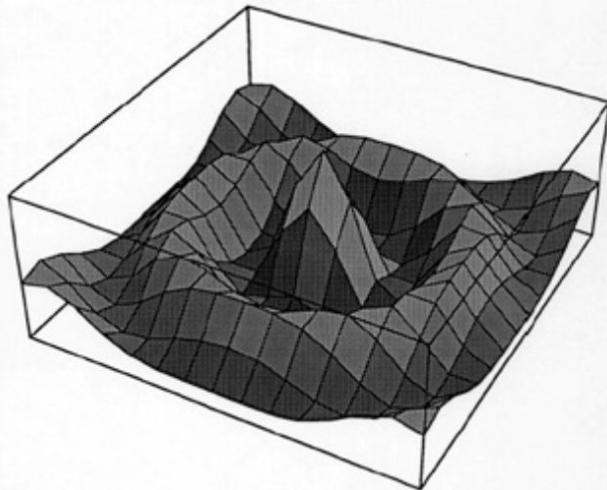
A power series expansion.

MathematicaTM

GRAPHICS

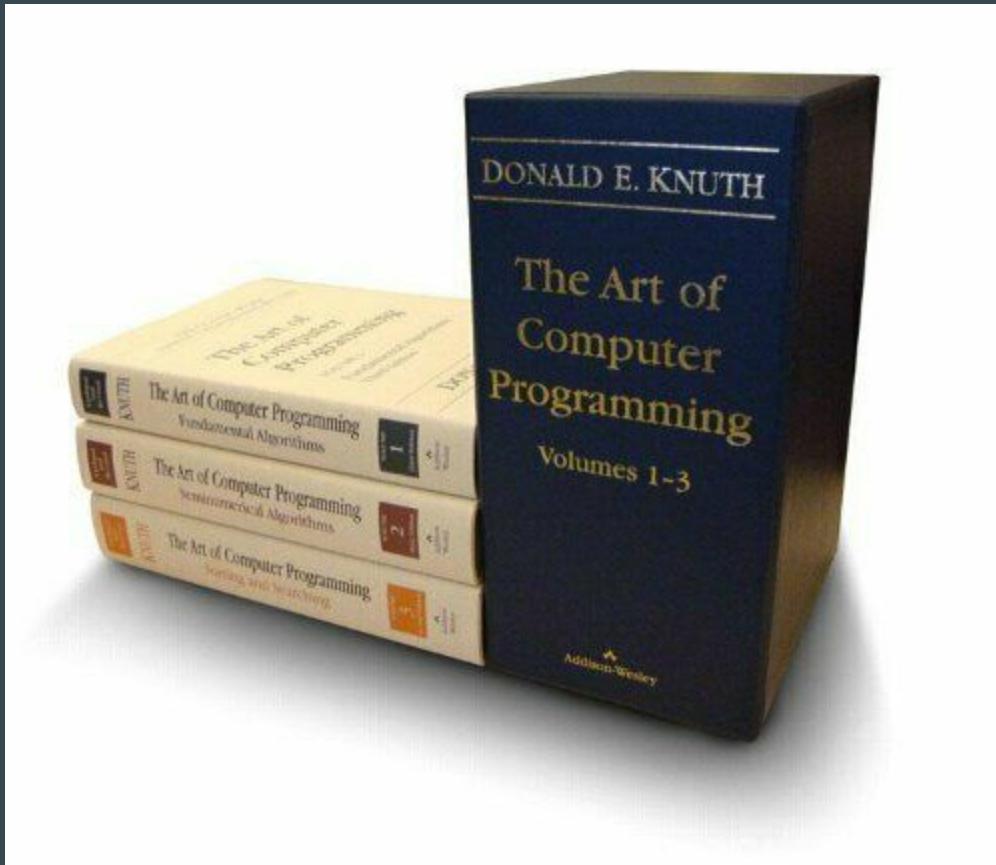
```
In[1]:= Plot3D[BesselJ[0, Sqrt[x^2 + y^2]], {x, -10, 10},  
{y, -10, 10}, PlotPoints->100]
```

```
Out[1]=
```



A three-dimensional plot of a Bessel function.

Going further back...



Literate Programming

Donald Knuth

Implemented the “WEB” system

Concepts of “tangled” and “woven”

Maple

Scientific computing environment + programming language

First GUI for Maple released in 1989

1992 -- release of the “worksheet” interface:

“Beginning with the Macintosh user interface for Maple V, the new user interfaces will all support the concept of a "worksheet" which integrates text, Maple input commands, Maple output, and graphics into one document.”

*Maple 10 - Untitled (2) - [Server 2]

File Edit View Insert Format Table Plot Spreadsheet Sketch Tools Window Help

Text Math 2D Input Times New Roman 36 B I U

> $2 + 2$

4 (1)

> $2 + 2;$

4 (2)

> $2 + 2 :$

> $\text{ifactor}(203490);$

$(2)(3)^2(5)(7)(17)(19)$ (3)

> ?factor

> $\text{help}(\text{factor});$

> $\text{ifctor}(203490);$

$\text{ifctor}(203490)$ (4)

> /

Symbol Recognition Expression Units (SI) Units (FPS) Common Symbols Matrix Components Greek Arrows Fenced Relational Relational Round Negated Large Operators Operators Open Face Fraktur Script Miscellaneous

Ready Memory: 0.31M Time: 0.01s Math Mode

*Maple 10 - Untitled (2) - [Server 2]

File Edit View Insert Format Table Plot Spreadsheet Sketch Tools Window Help

Text Math P Maple Plot Times New Roman 12 B I U E E E E E E

> with(plots);

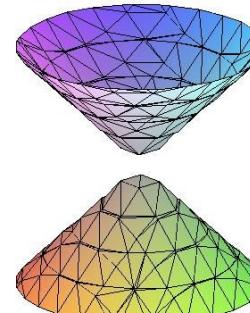
Warning, the name changecoords has been redefined

[Interactive, animate, animate3d, animatecurve, arrow, changecoords, complexplot, complexplot3d, conformal, conformal3d, contourplot, contourplot3d, coordplot, coordplot3d, cylinderplot, densityplot, display, display3d, fieldplot, fieldplot3d, gradplot, gradplot3d, graphplot3d, implicitplot, implicitplot3d, inequal, interactive, interactiveparams, listcontplot, listcontplot3d, listdensityplot, listplot, listplot3d, loglogplot, logplot, matrixplot, multiple, odeplot, pareto, plotcompare, pointplot, pointplot3d, polarplot, polygonplot, polygonplot3d, polyhedra_supported, polyhedraplot, replot, rootlocus, semilogplot, setoptions, setoptions3d, spacecurve, sparsematrixplot, sphereplot, surfdata, textplot, textplot3d, tubeplot]

> $A := x^2 + y^2 = z^2;$

> $A := x^2 + y^2 = z^2$

> implicitplot3d(A, x = -2 .. 2, y = -2 .. 2, z = -2 .. 2);



Memory: 3.56M Time: 0.68s Text Mode

Maple vs Mathematica

Standard Math Notation

Entering mathematical expressions that look like mathematical expressions is very easy in Maple. The equation editor automatically formats fractions and exponents as you type. You can enter the expression the same way you would write it down, and it appears in Maple as it would when written in your textbook. This makes the mathematics easy to enter and easy to read. Mathematica, however, uses some non-standard notation which requires the user to translate back and forth between standard mathematics and Mathematica syntax.

Here are examples of expressions entered using the default settings in both systems.

Maple	VS	Mathematica
$\sin(2x)$		$\sin[2x]$
$5x - 7 = 3x + 2$		$5x - 7 == 3x + 2$
$2x^2 + \cos\left(\frac{x}{2}\right)$		$2x^2 + \text{Cos}[x/2]$
$\lim_{x \rightarrow 0} \frac{\sin(x)}{x}$		$\text{Limit}[\text{Sin}[x]/x, x \rightarrow 0]$

Combining Text and Results

In Maple, it is very easy to combine text and mathematics in the same sentence. You can even have calculated results appear in the middle of a sentence, so that the sentence changes automatically if the results are updated.

The function $\frac{1}{(x - 1)^2}$ has an essential discontinuity at $x = 1$.

By changing the definition of the function and re-executing the document, the new discontinuity is found and the statement is updated appropriately:

The function $\frac{1}{(x - 3)^2}$ has an essential discontinuity at $x = 3$.

In Mathematica, it is not possible to combine text and mathematics results in this way. You can combine text and static math in the same cell, but you cannot display calculated results. If your results change, you must edit your statement by hand.

Enter vs. Shift Enter

In Maple, once you have entered your problem, you press the <Enter> key to tell Maple to perform the computation and give you the result. Typing “ $2+2$ <Enter>” results in 4.

In Mathematica, typing “ $2+2$ <Enter>” moves the cursor to the next line, without calculating anything. To ask Mathematica to perform the computation, you must press <Shift>+<Enter>. This non-standard interaction requires users to adapt their normal behavior.

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\$301/year [Subscribe](#)

Rise of Open Source

SciPy + IPython + Matplotlib

SciPy (2001): Created by Travis Oliphant, Eric Jones, and Pearu Peterson, it was a combination of scientific libraries for Python on top of the Numeric array type (later replaced by NumPy)

IPython (2001): “The IPython project provides an enhanced interactive environment that includes, among other features, support for data visualization and facilities for distributed and parallel computation” (from “IPython: A System for Interactive Scientific Computing”, 2007)

SciPy + IPython + Matplotlib (cont.)

Matplotlib (2003): “It was conceived by John Hunter in 2002, originally as a patch to IPython to enable interactive MatLab-style plotting via gnuplot from the IPython command-line. Fernando Perez was, at the time, scrambling to finish his PhD, and let John know he wouldn’t have time to review the patch for several months. John took this as a cue to set out on his own, and the matplotlib package was born, with version 0.1 released in 2003.” (<https://jakevdp.github.io/blog/2013/03/23/matplotlib-and-the-future-of-visualization-in-python/>)

Fernando Perez

Created IPython in 2001 as a graduate student

Currently: Associate Professor, Statistics, UC Berkeley
and Berkeley Institute for Data Science Senior Fellow

Recipient of the 2012 Award for the Advancement of
Free Software from the Free Software Foundation, and
the 2017 ACM Software System Award



Sage (2005)

SageMath is a free [open-source](#) mathematics software system licensed under the GPL. It builds on top of many existing open-source packages: [NumPy](#), [SciPy](#), [matplotlib](#), [Sympy](#), [Maxima](#), [GAP](#), [FLINT](#), [R](#) and [many more](#). Access their combined power through a common, Python-based language or directly via interfaces or wrappers.

Mission: *Creating a viable free open source alternative to Magma, Maple, Mathematica and Matlab.*

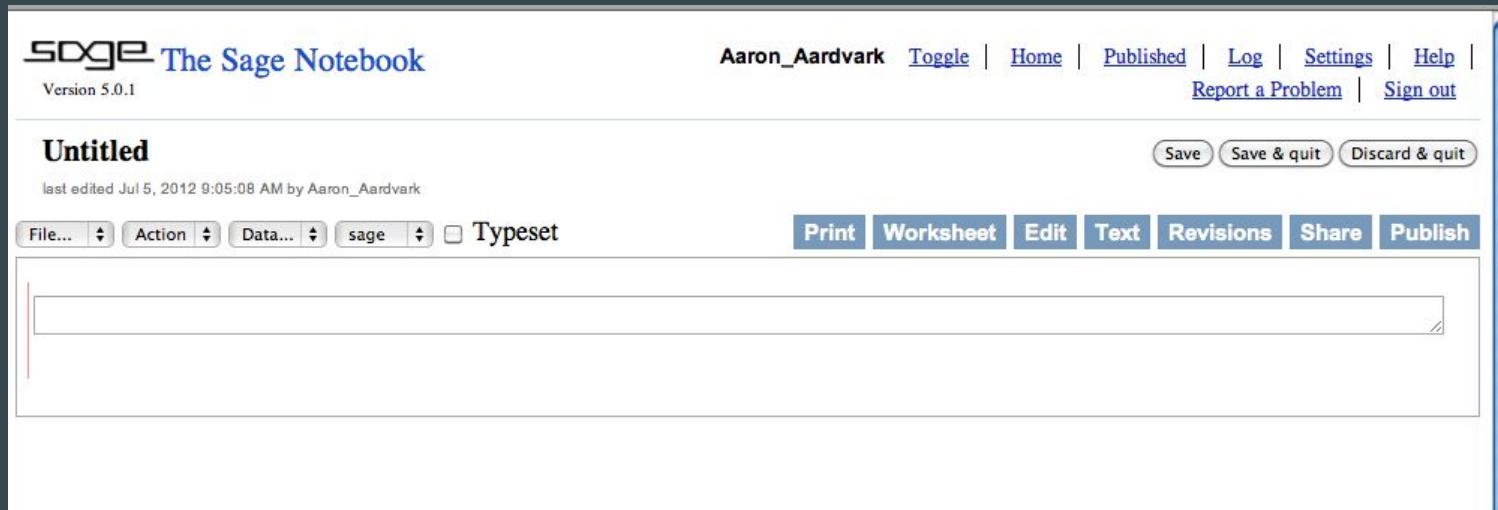
Sage cont.

Created by William Stein

Implemented in Python and Cython

Open Source license (GPLv3)

Sage Notebook/Worksheets



Screenshots from a tutorial circa 2012 (

<http://doc.sagemath.org/html/en/prep/Intro-Tutorial.html#sagenbcommands>)

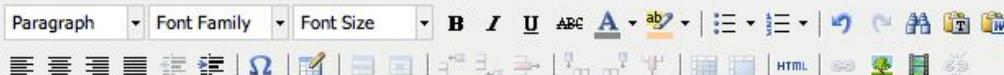
Untitled

last edited Jul 5, 2012 9:05:08 AM by Aaron_Aardvark

Typeset

2+2

4



Why is $2+3=5$ and not 1 ? I thought Sage did everything modulo 4...]

Path: p

2+3

5

You can also evaluate a cell using a keyboard shortcut.

- If a cell isn't active (such as below, in the live documentation), click in it.
- Then hold down the Shift key while you press the Enter key.

We call this “Shift-Enter”. Try doing Shift-Enter with this cell.

IPython Notebook (2011)

Starting the notebook server

You can start running a notebook server from the command line using the following command:

```
ipython notebook
```

The IPython Notebook

Introduction

The notebook extends the console-based approach to interactive computing in a qualitatively new direction, providing a web-based application suitable for capturing the whole computation process: developing, documenting, and executing code, as well as communicating the results. The IPython notebook combines two components:

A web application: a browser-based tool for interactive authoring of documents which combine explanatory text, mathematics, computations and their rich media output.

Notebook documents: a representation of all content visible in the web application, including inputs and outputs of the computations, explanatory text, mathematics, images, and rich media representations of objects.

Project Jupyter (2014)

Jupyter

Ju(lia) + Pyt(hon) + R

Project Jupyter (2014)

Spun off of IPython by Fernando Perez

Includes the Notebook interface and other language-agnostic parts of IPython

Present

Jupyter Notebook

The screenshot shows a Jupyter Notebook interface with the following details:

- Header:** "jupyter Untitled1 Last Checkpoint: 5 hours ago (autosaved)"
- Toolbar:** File, Edit, View, Insert, Cell, Kernel, Widgets, Help, Trusted, Python 3
- Toolbar Buttons:** File, New, Open, Save, Run, Cell Type, Code, Cell Mode
- Code Cell 1:** In [1]: `print("hello, world!")`
Output: hello, world!
- Code Cell 2:** In []: (empty)

JupyterLab

JupyterLab 1.0: Jupyter's Next-Generation Notebook Interface

JupyterLab is a web-based interactive development environment for Jupyter notebooks, code, and data. JupyterLab is flexible: configure and arrange the user interface to support a wide range of workflows in data science, scientific computing, and machine learning. JupyterLab is extensible and modular: write plugins that add new components and integrate with existing ones.

Chrome File Edit View History Bookmarks People Tab Window Help

hub.gke.mybinder.org/user/jupyterlab-jupyterlab-demo-xi8mcqc8/lab

File Edit View Run Kernel Tabs Settings Help

Lorenz.ipynb

The Lorenz Differential Equations

Before we start, we import some preliminary libraries. We will also import (below) the accompanying `lorenz.py` file, which contains the actual solver and plotting routine.

```
[1]: %matplotlib inline
from ipywidgets import interactive, fixed
```

We explore the Lorenz system of differential equations:

$$\begin{aligned}\dot{x} &= \sigma(y - x) \\ \dot{y} &= px - y - xz \\ \dot{z} &= -\beta z + xy\end{aligned}$$

Let's change (σ, β, p) with ipywidgets and examine the trajectories.

```
[2]: from lorenz import solve_lorenz
w=interactive(solve_lorenz,sigma=(0.0,50.0),rho=(0.0,50.0))
```

For the default set of parameters, we see the trajectories swirling around two points, called attractors.

The object returned by `interactive` is a `Widget` object and it has attributes that contain the current result and arguments:

```
[3]: t, x_t = w.result
[4]: w.kwargs
```

After interacting with the system, we can take the result and perform further computations. In this case, we compute the average positions in x , y and z .

```
[5]: xyz_avg = x_t.mean(axis=1)
[6]: xyz_avg.shape
```

Creating histograms of the average positions (across different trajectories) show that, on average, the trajectories swirl about the attractors.

JupyterLab Reference

JupyterLab

Docs » JupyterLab Documentation Jupyter | Edit on GitHub

JupyterLab Documentation

JupyterLab is the next-generation web-based user interface for Project Jupyter. Try it on Binder. JupyterLab follows the Jupyter Community Guides.

In this Notebook we explore the Lorenz system of differential equations:

$$\begin{aligned}\dot{x} &= \sigma(y - x) \\ \dot{y} &= px - y - xz \\ \dot{z} &= -\beta z + xy\end{aligned}$$

Left call the function once to view the solutions. For this set of parameters, we see the trajectories swirling around two points, called attractors.

First Lorenz Report value: Lorenz
 $t_1, x_1, y_1, z_1 = \text{solve_lorenz}(t_0, \dots)$ 3 minutes ago

Output View

lorenz.py



```
sigma = 10.0
beta = 8.0
rho = 28.0

def solve_lorenz(t_0, x_0, y_0, z_0, sigma, beta, rho):
    """Solve the Lorenz differential equations with given initial values and parameters.

    Parameters
    ----------
    t_0 : float
        Initial time.
    x_0 : float
        Initial x-value.
    y_0 : float
        Initial y-value.
    z_0 : float
        Initial z-value.
    sigma : float
        The parameter sigma.
    beta : float
        The parameter beta.
    rho : float
        The parameter rho.

    Returns
    -------
    tuple
        A tuple containing the time derivative of x, y, and z.
    """
    x, y, z = x_0, y_0, z_0
    dx_dt = sigma * (y - x)
    dy_dt = x * (rho - z) - y - x * z
    dz_dt = -beta * z + x * y
    return dx_dt, dy_dt, dz_dt
```

Getting Started

- Overview
- Installation
- Starting JupyterLab
- Reporting an issue
- Frequently Asked Questions (FAQ)
- JupyterLab Changelog

Mode: Command Ln 1, Col 1 Lorenz.ipynb

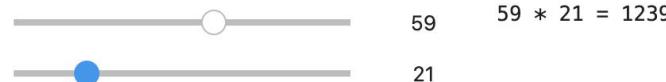
Voilà

Communicate your results with Voilà.

Voilà helps you communicate insights, by transforming a Jupyter Notebook into a stand-alone web application you can share. It gives you control over what your readers experience in a secure and customizable interactive dashboard.

So easy, voilà!

In this example notebook, we demonstrate how voila can render notebooks making use of ipywidget's `@interact`.



Binder

The screenshot shows the Binder web interface. At the top is the Binder logo, which consists of three overlapping circles in orange, red, and blue, followed by the word "binder" in a lowercase sans-serif font.

The main heading reads: "Turn a Git repo into a collection of interactive notebooks". Below this, a subtext says: "Have a repository full of Jupyter notebooks? With Binder, open those notebooks in an executable environment, making your code immediately reproducible by anyone, anywhere."

A large form area is titled "Build and launch a repository". It contains fields for "GitHub repository name or URL" (with a dropdown menu set to "GitHub" and an input field), "Git branch, tag, or commit" (input field), "Path to a notebook file (optional)" (input field), and a "File" dropdown menu. To the right of these fields is a large orange "launch" button. Below this section is a "Copy the URL below and share your Binder with others:" section, which includes a text input field containing placeholder text ("Fill in the fields to see a URL for sharing your Binder.") and a clipboard icon. At the bottom is a "Copy the text below, then paste into your README to show a binder badge:" section, featuring a text input field, a "launch" button, a "binder" button, and a right-pointing arrow icon.

Broad language support



Jupyter kernels

Kernel Zero is [IPython](#), which you can get through [ipykernel](#), and is still a dependency of [jupyter](#). The IPython kernel can be thought of as a reference implementation, as CPython is for Python.

Here is a list of available kernels. If you are writing your own kernel, feel free to add it to the table!

SageMath	Jupyter 4	Any	many		
Wolfram Language for Jupyter		Wolfram Engine, i.e., a Wolfram Desktop or Mathematica installation; <code>wolframscript</code> is optional but recommended			

Google Colab

The screenshot shows a Google Chrome browser window displaying a Colab notebook titled "Welcome To Colaboratory". The notebook content includes:

- Table of contents:** Getting started, Data science, Machine learning, More Resources, Machine Learning Examples, Section.
- Section "What is Colaboratory?":** Describes Colaboratory as an environment for writing and executing Python code in a browser. It lists benefits: Zero configuration required, Free access to GPUs, Easy sharing.
- Section "Getting started":** Explains that the document is an interactive Colab notebook. It shows a code cell with Python code to calculate seconds in a day, resulting in 86400.
- Text:** Instructions for executing code by clicking and pressing Command/Ctrl+Enter. It also notes that variables defined in one cell can be used in others.
- Code cell output:** A second code cell showing the calculation of seconds in a week, resulting in 604800.
- Text at the bottom:** A summary of what Colab notebooks are and how they work, mentioning executable code, rich text, images, HTML, LaTeX, and sharing features.

Github rendering

The screenshot shows a GitHub repository page for the `fastai / fastai2` project. The repository has 40 stars, 490 forks, and 173 issues. The `Code` tab is selected, showing the file `fastai2 / nbs / 01_layers.ipynb`. The branch is `master`. A commit by `sgugger` with the message "Fix #322" was made 28 days ago, with a commit hash of `da9c07c`. There are 5 contributors listed.

The notebook content is rendered as follows:

```
In [ ]: # default_exp layers  
# default_cls_lvl 3
```

```
In [ ]: #export  
from fastai2.imports import *  
from fastai2.torch_imports import *  
from fastai2.torch_core import *  
from torch.nn.utils import weight_norm, spectral_norm
```

```
In [ ]: from nbdev.showdoc import *
```

Layers

Custom fastai layers and basic functions to grab them.

Basic manipulations and resize

```
In [ ]: #export  
def module(*flds, **defaults):  
    "Decorator to create an `nn.Module` using `f` as `forward` method"  
    pa = [inspect.Parameter(o, inspect.Parameter.POSITIONAL_OR_KEYWORD) for o in flds]  
    pb = [inspect.Parameter(k, inspect.Parameter.POSITIONAL_OR_KEYWORD, default=v)  
        for k, v in defaults.items()]
```

fastai / fastai2

Watch 40 Unstar 490 Fork 173

Code Issues Pull requests Actions Projects Wiki Security Insights

Branch: master fastai2 / nbs / 01_layers.ipynb Find file Copy path

sgugger Fix #322 da9c07c 28 days ago

5 contributors

2390 lines (2390 sloc) | 74.9 KB

Raw Blame History

```
1 {
2     "cells": [
3         {
4             "cell_type": "code",
5             "execution_count": null,
6             "metadata": {},
7             "outputs": [],
8             "source": [
9                 "# default_exp layers\n",
10                "# default_cls_lvl 3"
11            ]
12        },
13        {
14            "cell_type": "code",
15            "execution_count": null,
16            "metadata": {},
17            "outputs": [],
18            "source": [
19                "#export\n",
20                "from fastai2.imports import *\n",
21                "from fastai2.torch_imports import *\n",
22                "from fastai2.torch_core import *\n",
23                "from torch.nn.utils import weight_norm, spectral_norm"
24            ]
25        }
26    ]
27}
```

Future(?)

More IDE-like Jupyter and more Jupyter in IDEs

JupyterLab 2.0 -- released April 2020

Added JupyterLab Language Server Protocol + Debugger

VSCodium shipping improved native support for Jupyter Notebooks

Hosted solutions/notebook as an interface to compute



kaggle

The word "kaggle" in a large, light blue, rounded sans-serif font.

Real-time collaboration

The notebook you'll love to use

Deepnote is a new kind of data science notebook. Jupyter-compatible with real-time collaboration and easy deployment. Oh, and it's free.

Enter your email...

Get early access

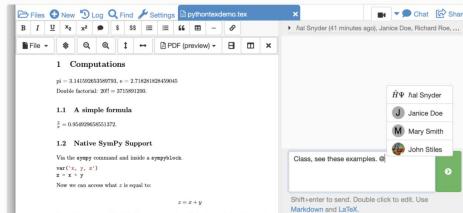
Live collaborative editing

Multiple users can collaborate on a project. As soon as a collaborator is added to a project (see [Notes on Managing Courses](#)) they share both the project and the associated files.

Live collaborative editing is possible in CoCalc. If one of your collaborators updates a notebook, the rest can see the changes as they are being made (similar to Google Docs).

@Mention collaborators in chat

CoCalc chats support an `@mentions` feature, where you type `@` and a list appears of collaborators, which you can select from. Anybody mentioned there will get emailed (unless they are mentioned again in the next few hours, since we don't want to spam people). This helps ensure people know about chats. Any chat will cause the notification count to go up in the bell in the upper right, whether or not you are mentioned.



How to review & work with git?

fastai / nbdev

Code Issues 1 Pull requests 2 Actions

ReviewNB DOCS BLOG PRICING FAQ SUPPORT LOGIN

Create delightful python projects using Jupyter Notebooks

Diff & Commenting for Jupyter Notebooks

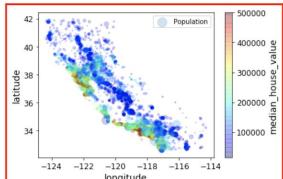
Say Goodbye to annoying JSON diffs!

Install GitHub App

Need to Self Host? [Fill the Form](#)

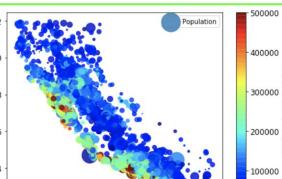
```
1 housing.plot(kind="scatter", x="longitude", y="latitude", alpha=0.8,
2                 s=housing['population']/100, label="Population",
3                 figsize=(10,8),
4                 c="median_house_value", cmap=plt.get_cmap('jet'), colorbar=True,
5                 sharex=False)
6 plt.legend()
7 save_fig("housing_prices_scatterplot")
```

Saving figure housing_prices_scatterplot



```
1 housing.plot(kind="scatter", x="longitude", y="latitude", alpha=0.8,
2                 s=housing['population']/100, label="Population",
3                 figsize=(10,8),
4                 c="median_house_value", cmap=plt.get_cmap('jet'), colorbar=True,
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7 save_fig("housing_prices_scatterplot")
```

Saving figure housing_prices_scatterplot





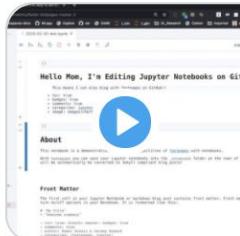
Hamel Husain
@HamelHusain



So excited about [@github](#) Codespaces. You can edit Jupyter Notebooks directly on GitHub, and serve arbitrary web applications on various ports.

Sign up for the beta if you have not already
github.com/features/codes...

Here is a demo with fastpages:



JupyterOnGitHub fastpages

Demo of GitHub Codespaces w/fastpages. Shows you how you can edit a notebook with VSCode, and see updates on ...
[🔗 youtube.com](https://youtube.com)

10:27 AM · May 20, 2020 · [Twitter Web App](#)

Julien Chaumond liked



Hamel Husain
@HamelHusain

💡 Automatically drop links to a Jupyter notebook with **the right dependencies** in your PRs with this simple Actions workflow 🙌 . Powered by [@mybinderteam](#) . It's also free 💰 to use.

Instructions: gist.github.com/hamelsmu/f8f98...

The screenshot shows a GitHub pull request interface. On the left, there is a code diff snippet. On the right, a comment from user **hamelsmu** is visible, followed by a reply from the **github-actions** bot. The reply contains a link to launch a binder notebook.

Binder demo #21

Open hamelsmu wants to merge 2 commits into `master`

Conversation 1 Commits 2 Checks

hamelsmu commented 11 minutes ago

Actions will comment with a Binder link below that

remove file

github-actions bot commented 10 minutes ago

Launch binder Launch a binder notebook on this branch

5:49 PM · May 20, 2020 · Twitter Web App

3 Retweets 13 Likes

Conclusion

@hortonhearsafoo