Jupyter outside of data science

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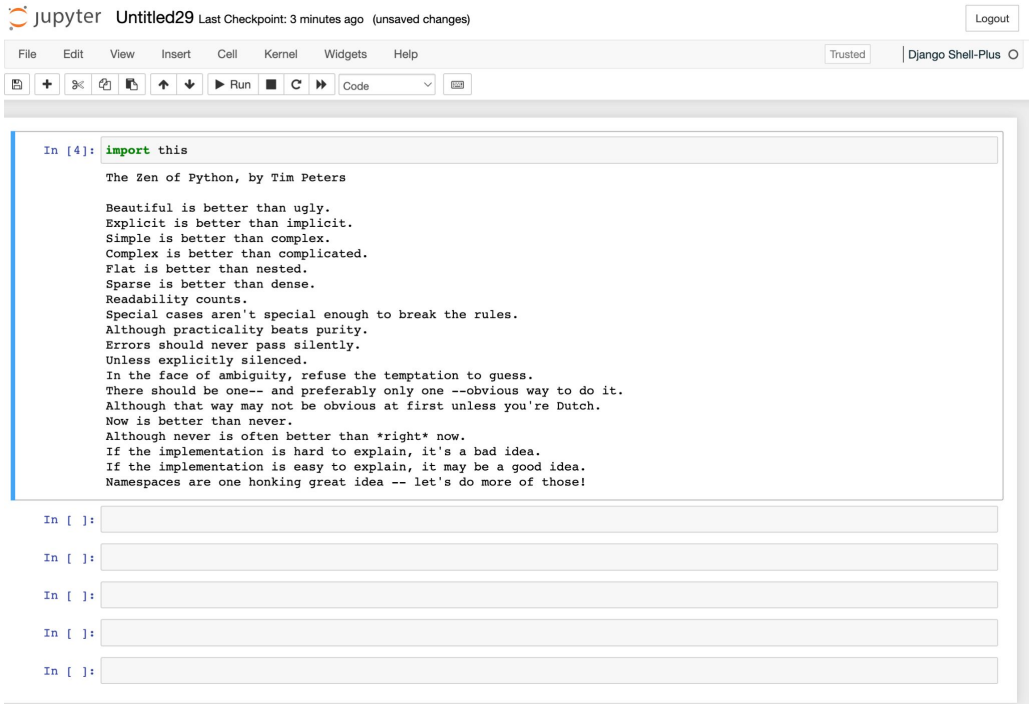
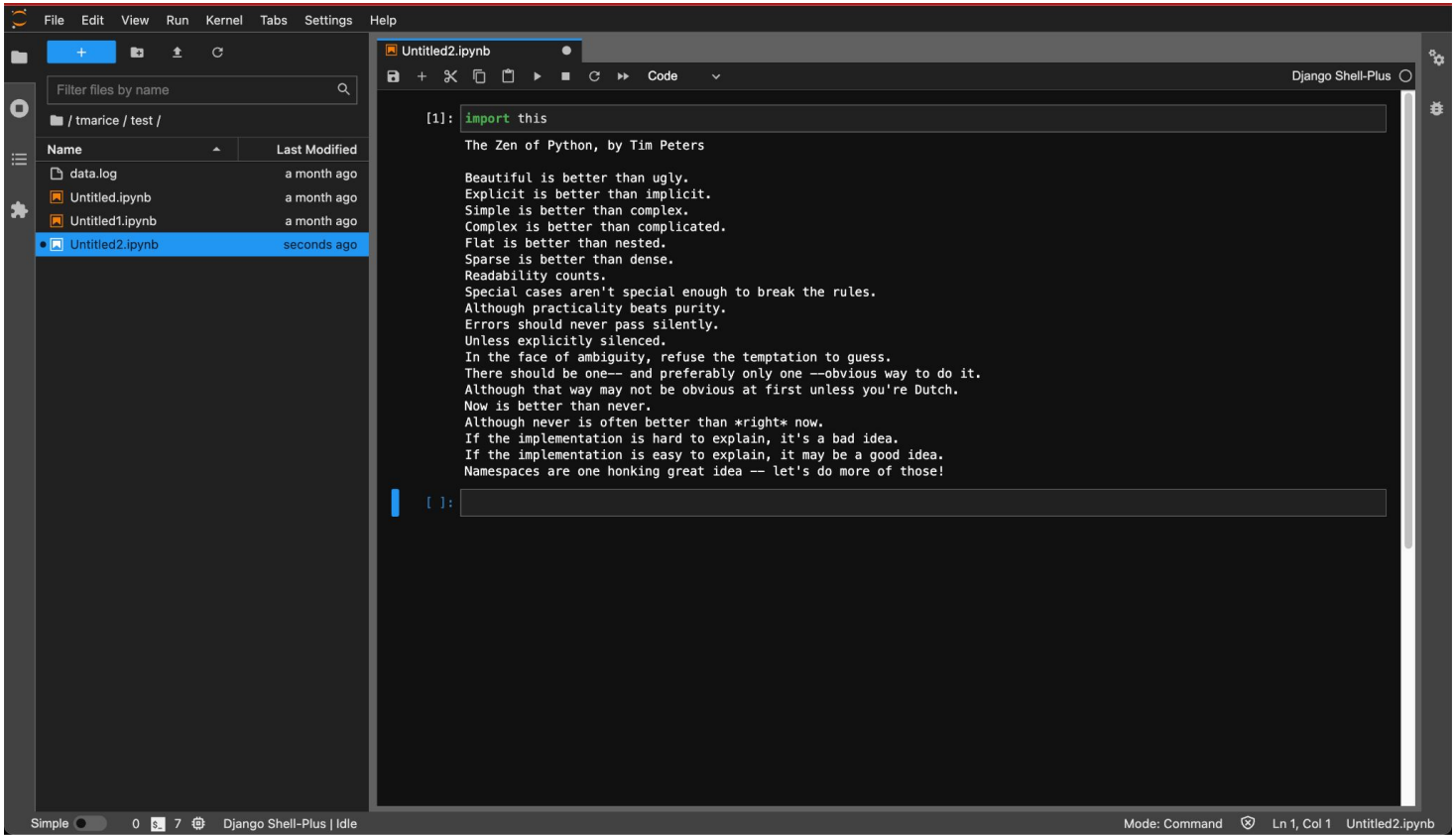
Jupyter and notebook software – Ipython & Jupyter

- Ipython Notebook == Jupyter Notebook



Jupyter and notebook software – JupyterLab



Jupyter and notebook software – JupyterHub

- JupyterLab is single user
  - Multiple people can use it at the same time, but they all share the filesystem and configuration

- JupyterHub spawns new JupyterLab instances for each user

Local client, remote kernel

- In-browser IDE is not optimal UX
- Pycharm & VS Code support remote kernels

Nuanced discussion

“I don't like notebooks” - Joel Grus, JupyterCon 2018

vs

”I Like Notebooks” - Jeremy Howard, almost on JupyterCon 2020

The “never use notebooks” crowd

- Hidden state
  - Need to run cells exactly once, in order, with exact 3rd party dependencies
- Less rigor
- Hard to test
- Promotes bad habits
- Worse UI than your own editor
  - Autocomplete, linters, autoformatting, etc.

The “use notebooks for everything” crowd

- Tests, docs and code are co-located
- Exploratory coding in a live coding environment
- Diffs can show changes in output next to changes in code
- Nbdev solves a lot of the complaints

Our setup

- Python
- Django
- PostgreSQL
- AWS
- JupyterLab

JupyterLab setup

- Dedicated EC2 instance running JupyterLab
- CodeDeploy for delivering new code to server
- Multi-user environment via JupyterLab
- django-extensions kernel for Django integration
    - Use production settings for access to production environment

Issues

- No elegant way to monitor progress if network connection is lost between kernel and frontend
  - Workaround: Save progress to file
- No way to automatically shut down old kernels
  - Workaround: JupyterHub
- AWS doesn’t have a nice general-purpose managed solution
  - SageMaker is very data science oriented
- Not very git-friendly
  - Workaround: use Github, or use tools to convert .ipynb to .py files
- It’s a shared environment with shared resources
  - Loading 16 GB .csv into memory ruins the party for everyone

Things I learned the hard way:

- Add cell execution timestamps
  - Notebooks save complete state, it’s nice to know from how far back the state is
- Add docstrings to your functions
  - You’re not going to remember which problem you were solving in 6 months
- Shut down your unused kernels
  - They accumulate and use up resources even when idle

Our use case #1: Operations

- Running one-off ops on production infrastructure
- Notebooks are an alternative to running scripts in shell on production servers
- Easier to develop than writing script locally and then uploading or C/P to production shell

Our use case #2: Data Exploration

- Related to data science, but less formal
- E.g. investigate why some email campaign didn’t do well
- Practically impossible to do in the shell – need the visualization capabilities

Thank you!

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