

Getting Started with Python in Astronomy

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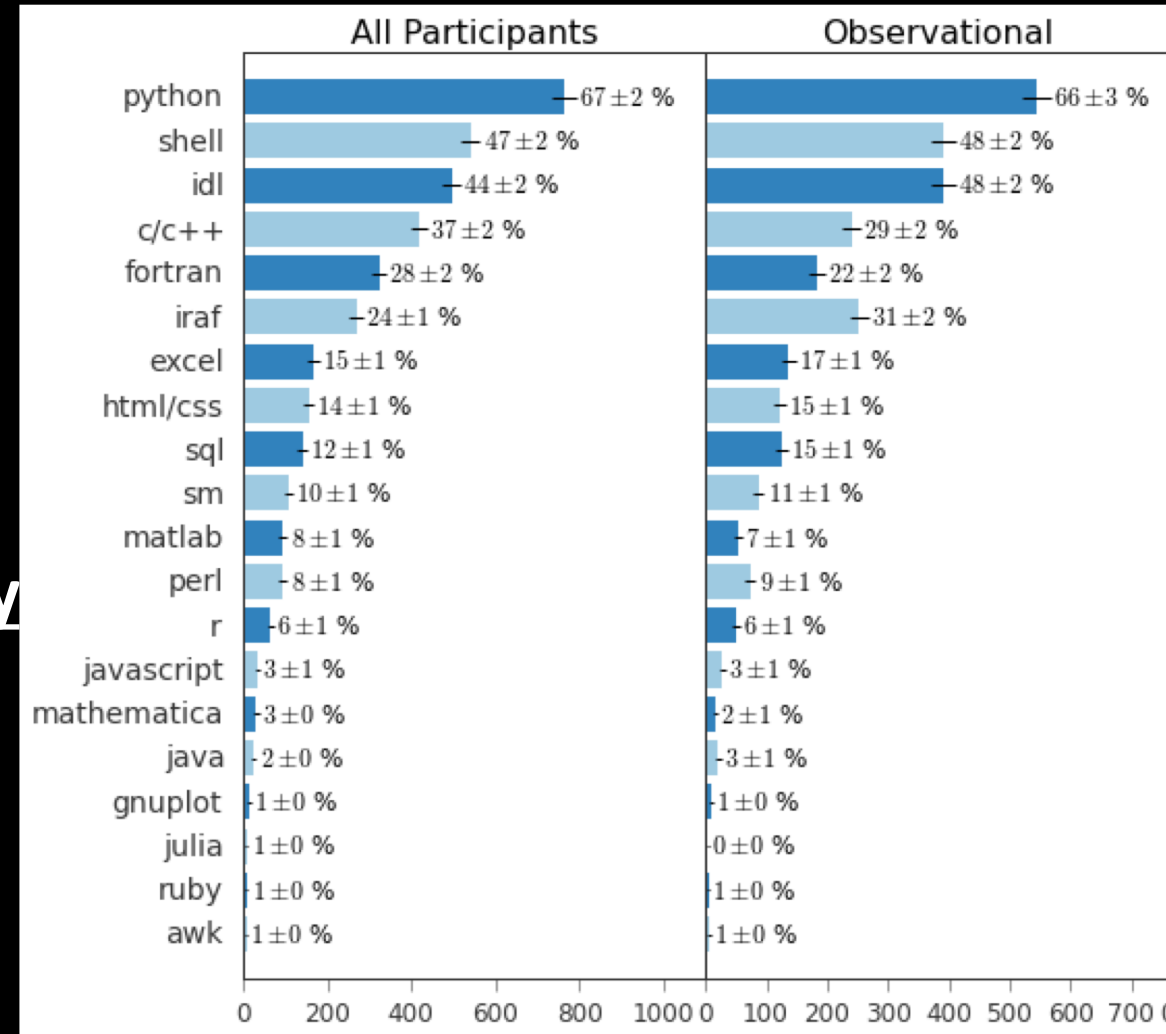
Astro 257

Target Audience

- Someone who knows how to code, but hasn't used python before.

Why Python?

- Free
- Fast to write
 - Your time is valuable
- Large open source community
- Most common language in astronomy



Which Python? 2 or 3?

- 3.
 - If your advisor uses python 2-only code, fine, but I'd recommend having python 3 be your default, and only activating python 2 when needed.
 - See: conda environments, pyenv, virtualenv or similar tools to switch versions
 - Many major astronomy packages are no longer updated for python 2. If you use 2, you're already missing out on the newest features.
- The exact version of 3.X probably doesn't matter.
 - The current is 3.7, so that's a good place to start.

Which installation?

- python.org, anaconda, homebrew, macports, system?
- Rules of thumb:
 - Don't use whatever python comes preinstalled on your computer. If you break it, your OS might stop working
 - Don't use homebrew/macports for your main python installation. It doesn't know how to update python packages, so it might break things unknowingly
- **In short, use anaconda or python.org**
(in my experience anaconda is easier to reinstall if you mess things up)

Which package manager?

- To update python packages use either pip or conda, but don't use both.
 - If you installed using anaconda, use conda. If not, use pip.
- `pip install --upgrade <package_name>`
- `conda install <package_name>`
- `conda update <package_name>`

Ways to Run Python

- Interpreter (“REPL”)
 - You manually type each line. All code lost when you exit
- Script file (.py)
 - The most reliable + easiest-to-reuse method
- Jupyter notebook
 - Most usefully-interactive.
 - Great for testing out some code, and then when the code is mature, then you move the core code into a .py file

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[Demo of each]

[Interactive Demo]

Notebook can be downloaded [here](#), or viewed [here](#).

Best ways to learn a new language?

- A project / class!
- Blogs
 - jakevdp.github.io (isn't frequently updated, but has a great set of older posts)
 - <http://adwasser.space/tag/python.html>
- Tutorials
 - <http://www.astropy.org/astropy-tutorials/tutorials.html>
- Look at the code from a more experienced coder
- Exercises
 - practicepython.org

Communities / Mailing lists to learn more about Python in Astronomy

- Facebook
 - [Python Users in Astronomy](#)
 - [Astrostatistics](#) (not python specific, but is partially python)
- The “users” mailing lists for packages you often use
 - E.g. [astropy's list](#)
 - Especially important if you regularly use a small/niche package

I'm sure there are plenty of other good options that I might not know of!