

Codesgiving

Goals

- Concepts for approaching open-source
- Open-source contribution ideas
- Practice making an impact

Context

Thanksgiving is a holiday practiced in many countries which focuses on **gratitude for good harvests** of the preceding year.

Context

This presentation will be about channeling the spirit of Thanksgiving by giving our *thanks* through *code*.

Open-source Harvests

- What have you harvested from open-source?

Open-source Harvests

CytoTable dependencies:

- Show Python dependencies of CytoTable and count the number of lines
- `poetry run pip freeze | wc -l`
- `141`

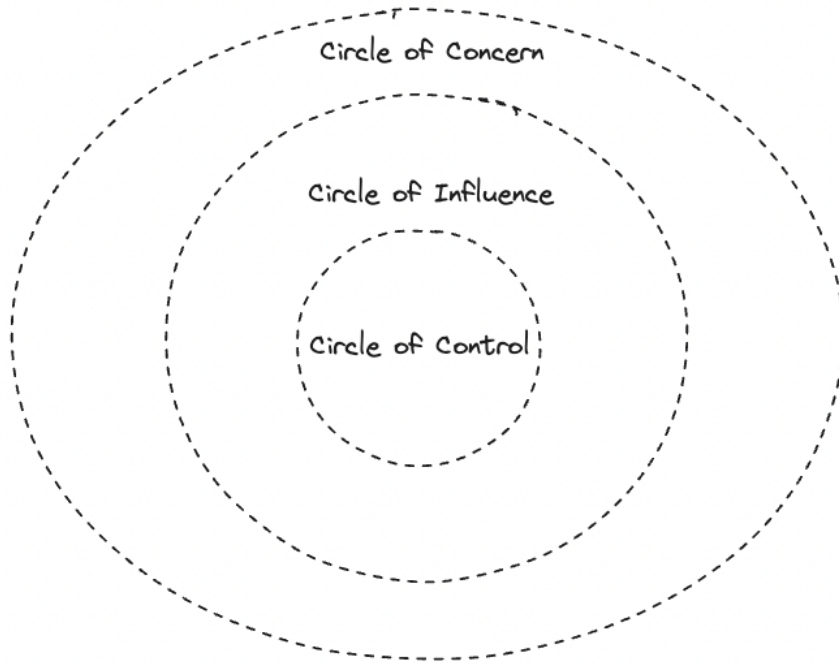
Open-source Harvests

- How can we celebrate open-source harvests?

Open-source Harvests

- Open-source can be an *adjective*, *noun*, or a *verb*.
- Open-source is alive and involves software gardening.

Open-source Participation



- Influence counts! **Circles of control and influence**

Open-source Participation

- Communication matters!

“Six degrees of separation is the idea that all people are six or fewer social connections away from each other.” -

Six degrees of separation

Open-source Participation



- Data thinking

Open-source Impact

CPython example through estimations:

- **Github users** $\geq 100,000,000$
GitHub Blog: 100 million developers and counting
- **Programming languages**
Python entails 17.79% of GitHub Pull Requests
GitHub 2.0 Programming Languages
- **Potential for impact**
17.79% of 100 million : 17,790,000 people (users as developers)

Open-source Impact

Open issues:

- ~7,000 issues!
- <https://github.com/python/cpython/issues>

Open-source Impact

“The Pareto principle states that for many outcomes, roughly 80% of consequences come from 20% of causes (the”vital few”).” - [Pareto principle](#)

Open-source Impact

Are there “vital few” areas where open-source contributions could help?

Python Example

Python `sqlite3` and context managers.

1. Saw feedback about closing `sqlite3` connections.
2. Tried to open feature request
(issues indicate to open discussion first)
3. Opened discussion
4. Submitted issue
5. Fix related to issue

Python Example

How much will it help?

- Created public discussion content
- Added public issue documentation
- Resulted in public-facing documentation updates
- Influences developer practices upstream?

CellProfiler



CellProfiler

- [@jenna-tomkinson](#) helped communicate issues with Conda environments.
- Anecdotally I had witnessed these too, but didn't know how much this might effect the community or whether the issue still existed on my device.

CellProfiler Impacts

We can use GitHub, PyPI, and bibliometrics for understanding the impact metrics:

- **GitHub stars:** 817 ([link](#))
- **PyPI downloads:** 491 ([link](#))

CellProfiler Impacts

- **Google Scholar results:** 15,600 results ([link](#))
- **BioRxiv results:** 1,801 results ([link](#))
- **Estimate:** 16,000 articles since 2005 ([initial CellProfiler release](#)) = 888 articles per year
- **Potential for impact:** about 500 research software engineers (or projects?) and 900 new articles per year

CellProfiler Impacts

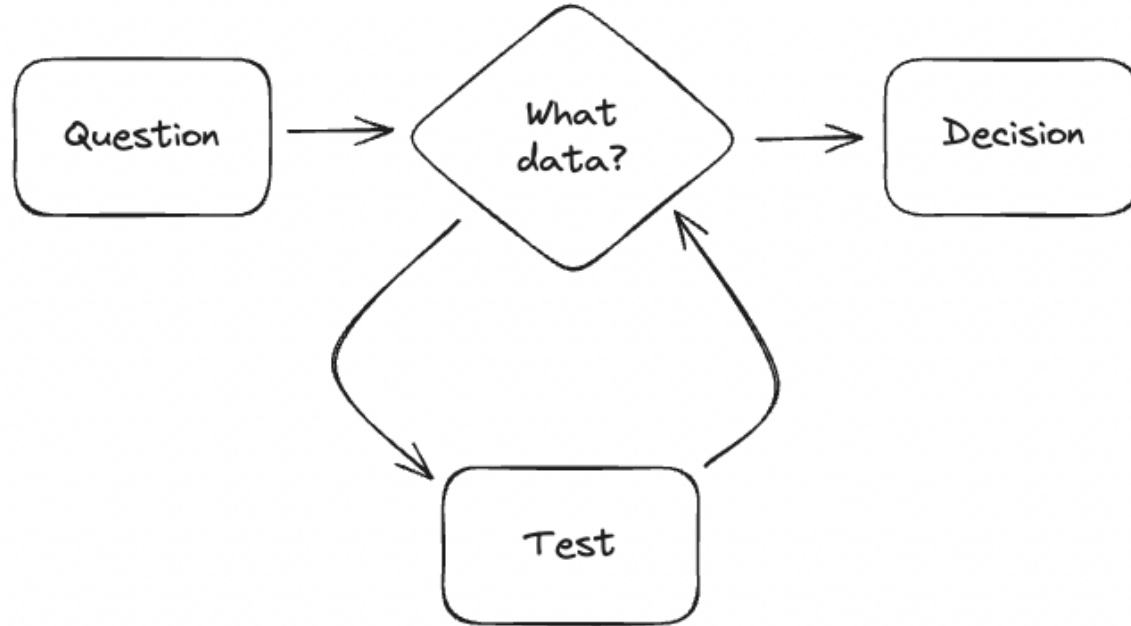
Open issues:

- ~270 issues ([total issues link](#))
- **Targeted search:** 11 open issues, 48 closed issues ([issues search link](#))

CellProfiler Exploration

- How can we try to communicate, influence, or fix this challenge?

CellProfiler Exploration



- **Test driven development**

CellProfiler Exploration

Troubleshooting process:

1. Verify challenge
2. Develop solution
3. Test solution

CellProfiler Exploration


- Forked the repository with intent to verify
- [Fork branch link](#)

CellProfiler Exploration

- Test many platforms in a reproducible container each push during development
- This makes every push a kind of hypothesis test about a fix
- [GitHub Actions matrix strategy](#)
- [GitHub Actions implementation](#)

CellProfiler Exploration

Troubleshooting process:

1.  Verify challenge
2. Develop solution
3. Test solution

CellProfiler Participation

More participation to come!

Closing Thought

- “You know more than you can say.”
(from a Radiolab episode)
- What would you choose to give to the future?

Gratitude

Thank you all for who you are and what you give.

Happy Thanksgiving!