Real Programmers Don’t Write Research Software

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- Statistics
- Data science
- Software engineering
- Bioinformatics
- HPC

Abject-oriented programming
“I’m not a software engineer”

- I don’t have formal tech qualifications
- I’m a researcher
- I’m a data scientist
- I’m a bioinformatician

- I’ll fix things without you having to raise a ticket
- I don’t need to jump through enterprise IT hoops
Real programmers

- Write in C
- Don’t use high-level languages
- Do their own memory management
- Don’t do web development
- Don’t use GUIs
- Don’t use IDEs
- Use vim
The Sorcerer’s Apprentice
The Sorcerer’s Apprentice
The Sorcerer
#!/bin/bash
set -e -u -o pipefail
Guardrails

- Checking things automatically
- Doing the same thing twice
- Breaking things safely
- Collaborating safely
Environments

- Separate dependencies for different projects
- Python: virtualenv, conda
- R: renv
Static analysis

- Check your code without running it
- Enforce stylistic conventions
- Eliminate typos and silly errors
- Python: black, flake8
- R: lintr, styler
- pre-commit
Git

- It’s an essential part of modern IT
- It’s impossible to use
- Let your IDE do it for you
DevOps tools

- Tools are designed to scale from laptops to cloud
- Capture old tech stacks in containers
- Pipelines from one domain can be reused for computation in others
Culture

- Felienne Hermans: *The Programmer’s Brain*
- Confusion is uncomfortable
- We react to this with visceral language
- This can contribute to gatekeeping and exclusion
Code review

- Vulnerable, and therefore intimidating
- Needs team support
- Has to be budgeted for
- Collaboration, not criticism
Building community

- **Research Software Engineering Unconference 2022**
  - Researchers who code and IT professionals
  - Overcoming isolation between teams and within institutions
- **NumPy: Newcomers Hour**
  - Make open source projects more inclusive
Thank You!

- Links and references: https://etc.mikelynch.org/eres22/
- Questions?