Programming Practices for Research in Economics

Foundations

Lachlan Deer Julian Langer

Department of Economics, Univeristy of Zurich

Winter 2019

Welcome!

Figure 1:

Who we are

2 PhD students

- Lachlan
- Julian

Getting to know you

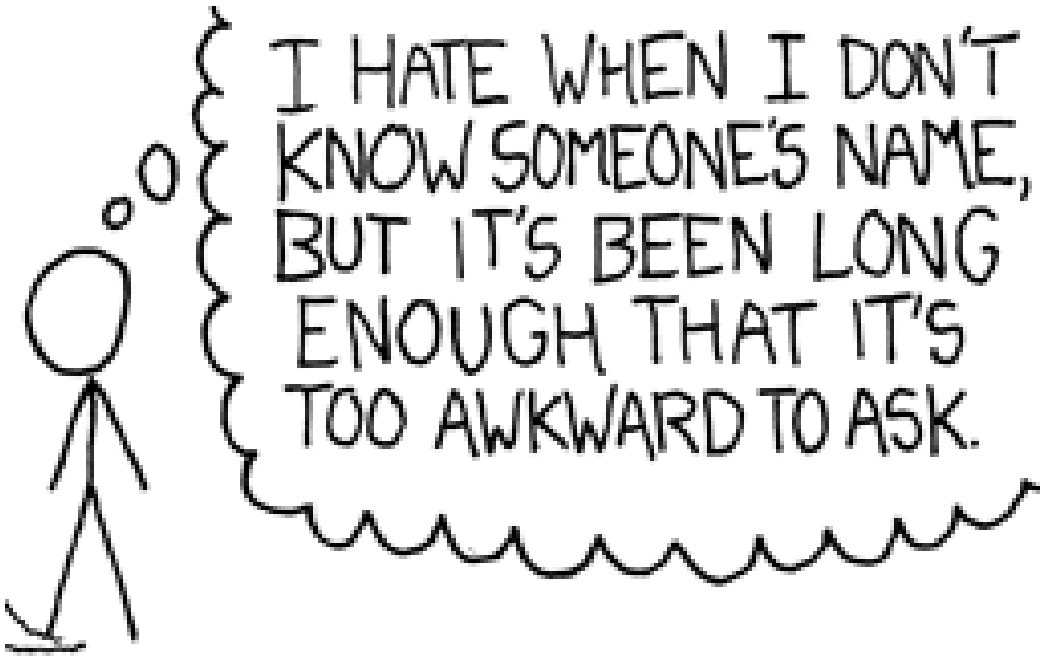

Figure 2:

Basic Information

Group is a mix of "for credit" and audit students

- For credit students need to
  - enrol using sheet we will pass around on the last day
  - register for course on `UZH module booking`
  - submit an assignment

Sessions are designed to be interactive

- Mix of *live coding & exercises*
- We want to get you comfortable using your computing environment to solve problems
- Ask questions!

Structure of each day

- Session 1: 9.30-12.30
- Session 2: 14.00 - 17.00
- Expect coffee breaks in each session
  - Exactly when depends on the leader of a session, and the material
- No scheduled office hours
  - Talk to us during the day
  - Email for appointment after class if want to discuss assignment

Where to Find Information

- Course website:
  - `pp4rs.github.io/2019-foundations-uzh`
- Installation Guide:
  - `pp4rs.github.io/foundations-installation-guide`
- Course Chatter:
  - `pp4rs.slack.com/`, #pp4rs-2019
- GitHub repository:
  - `github.com/pp4rs`

Assessment

The basics:

- One final assignment
- Can be submitted in groups of 1-2 people
- Due 4 weeks *after* last class
- Propose to us an idea before you start

Use what you learn in this course to solve a non-trivial economic problem:

- Code must be in split into meaningful sub-files
- Solution must be submitted using GitHub
- Solution must be executable using a single line of code, e.g. using `Snakemake`

Social Event

- Join us for casual drinks
- When: This Friday, after class
- Location: TBA

Motivation

We will cover things that we wish someone had taught us when we were starting out in graduate school

Why this course exists

1. Fill in the gaps left by traditional econometrics and methods classes.
   - Practical skills that tools that will benefit your dissertation and future career.
   - Neglected skills like how to clean data, organize & track evolution of projects.
2. Data science skills largely distinct from (and complementary to) the core 'metrics oeuvre familiar to economists.
   - Data viz, cleaning and wrangling; programming; version control, reproducible workflows.

Course Goals

Broad Goals for the Course

1. Improve computing skills, so you can do things you could not do before
2. Show how can do a given set of things with less effort
3. Increase the confidence in results that are produced this way (both yours and others' results)

Academic Research and Open Science

EU policy for all publicly funded research being *open* by 2020

- 4Rs (Pagan and Torgler, Nature 2015)
  - Reproduction: Can others reproduce you results using your data?
  - Replication: Can others replicate your results using new data?
  - Robustness: Do your results depent on the assumptions you made?
  - Revelation: Do you communicate the reasoning for your conclusions transparently?

Industry Demands Open Source

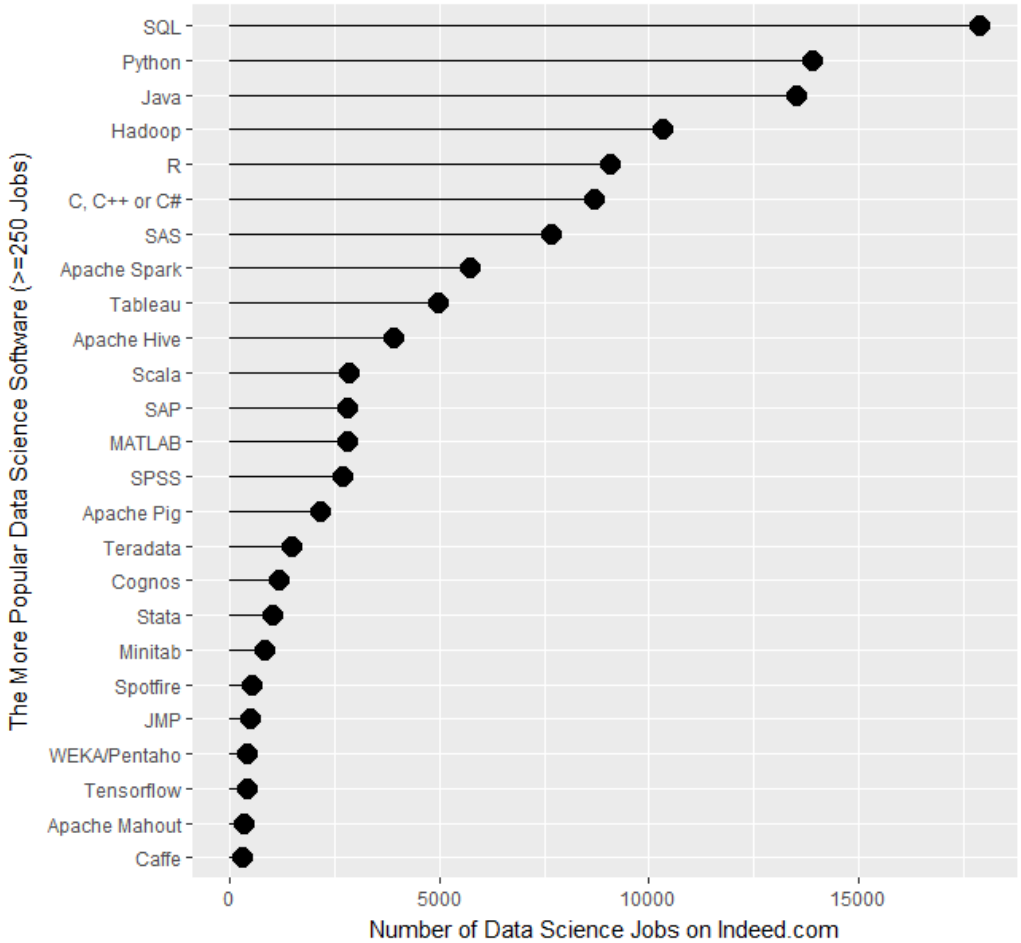

Figure 3: Required software for data-science jobs

Economics PhDs aren't prepared for Industry

Econ PhD graduates report that:

- R/Python is required in their first job
- Need to cooperate on coding tasks with others

Tech companies who hire PhD Economists say that:

- Econ PhDs are expensive to train because they don't have the *right* software skills
- Most don't 'catch up'
- Impacts willingness to hire
- (Summary of a discussion by senior economists empolyed by tech companies at an academic conference)

What We Teach

1. Unix shell
   - Text based interface to computing
   - Automate repetitive tasks
2. Git
   - Track/control and share work
3. R
   - Build modular code to solve typical economics problems
4. Snakemake
   - Automate the execution of your research project

Let's Get Started!

Figure 4:

Acknowledgements

This module is based on the 2016 and 2017 versions of the course:

- `Programming Practices For Economists`, by Lachlan Deer, Adrian Etter, Julian Langer & Max Winkler

It is designed after and borrows a lot from:

- `Effective Programming Practices for Economists`, a course by Hans-Martin von Gaudecker
- `Data Science for Economists`, a course by Grant McDermott

License

Suggested Citation:
Lachlan Deer and Julian Langer, 2019, Programming Practices for Research in Economics: Foundations, University of Zurich

Programming Practices Team

Programming Practices for Research in Economics was created by

- Lachlan Deer
- Adrian Etter
- Julian Langer
- Max Winkler

at the Department of Economics, University of Zurich in 2016.

These slides are from the 2019 Foundations edition, conducted by

- Lachlan Deer
- Julian Langer