Intro

- visual neuroscience and electrophysiology
- joined Laura Busse's lab, work on mouse vision and behaviour, while recording neurophysiology and doing optogenetic manipulation
- my python experience:
  - needed visual stimulus presentation program
  - found VisionEgg, written in Python by a neuroscientist/entomologist, flexibility, features we needed, and it was free!
  - not just free, open source: code can be inspected and modified by anyone, if desired
  - Python was the first open-source thing I'd used, eventually switched from windows to linux
- also use python for:
  - neural spike sorting & data analysis
  - database system for storing all our lab data
  - simpler things like renaming a bunch of files/folders in nested hierarchy
  - arithmetic, simple calculations instead of a calculator
- motivation:
  - example: load data, analyze, plot, save
- quick intros: name, status, programming background, data analysis wants/needs
- helping each other out
- course is lecture + exercise class (Nick)
  - lecture: introduce concepts, exercise class: practice the concepts
- grades:
  - attendance: 30%, all or nothing
    - can miss up to 3 out of 14 days, any more and no credit
  - participation in both lecture and exercise class: 30%
    - good, mediocre, none: 100%, 50%, 0%
  - final project: 40%
    - meet list of requirements that are fairly easy to fulfill
    - code needs to run successfully
    - work on it during last 2 or 3 exercise classes
  - no homework! but programming is a skill, like any other language, need to practice listening/speaking it, or in this case, reading/writing it

Outline

1. Python basics
2. Python basics 2
3. collections, files
4. numpy 1D arrays
5. plotting with matplotlib
6. numpy ND arrays, numpy functions
7. algorithms
8. organizing code, data, results
9. version control with Git

10. object-oriented programming
11. data analysis with Pandas
12. command line interfaces
13. intro to GUIs: Jupyter notebook & PyQt
14. data acquisition