Python Lab

Summary and Resources

Proteomics Informatics, Spring 2014

Week 12

22nd Apr, 2014

Himanshu.Grover@nyumc.org

Covered a lot of ground

- Fundamentals:
  - Basic data types and operations
  - Core data structures
  - Concept of variables, statements, expressions
  - Flow control statements
    - If/else conditional blocks
    - Repetitive computation (for loops)
  - Functions & design guidelines
  - Modules (import statements)
  - Little bit of file-handling
- Toolbox:
  - IDEs (Eclipse, IPython)
  - Code exploration and debugging (ipdb)
  - Getting help (read code documentation through ipython)

Covered a lot of ground

- Several libraries (data analytics ecosystem):
  - Pandas
  - Matplotlib
  - Little bit of scipy/numpy/math
- Several Examples:
  - Interactive vs. batch processing
  - Logically breaking down your computational goal into code units
  - Design choices
    - What functions
    - What data structures
    - Etc.

Practice makes Perfect

- Develop your own project; implement some algorithms
- Move day-to-day work to python
- Learn new libraries and functionality
  - Dig deeper into sourcecode. Ex. Pandas, Matplotlib, BioPython
  - Join their team, contribute to code and/or documentation
- Experiment with different design choices
  - Focus on “correctness”, “elegance” and “performance”

Resources

- Python official documentation (http://docs.python.org)
- Books
  - Learning Python (5th Edition)
  - Python for Data Analysis (Pandas Book)
  - Think Series (Think Python, Think Stats, Think Complexity)
  - Fundamentals of Python – From First Programs Through Data Structures
  - Clean Code; Design Patterns (more general)
- Conferences (videos): PyCon, PyData, SciPy, EuroSciPy, EuroPython
  - Videos on various topics (Ipython, Pandas, web frameworks, databases, matplotlib, debugging, profiling, many, many more)
- Online education & other web resources:
  - Khan's Academy, Coursera (??)
  - http://code.activestate.com/ (Python cookbook recipies)
- Documentation:
  - Matplotlib user guide (http://matplotlib.org/contents.html)
    - Also has a lot of code for various examples
  - Numpy user guide (http://docs.scipy.org/doc/numpy/user/)
  - Scipy reference (http://docs.scipy.org/doc/scipy/reference/)
- Sackler Programming Club - Pamela Wu
- Fall term Python course **(??)**