NSCI 580A5: Genomics data analysis in Python

Website linked to from Wiki home page:

This module is part of a Computational Biology for Life Scientists Series

NSCI 580A5: Genomics data analysis in Python

Prerequisites

Linux as a computational platform or a familiarity with UNIX/Linux and working from the command line.

Textbook

We will use the free textbook Python for everybody.

Instructors

	Office	Office Hours
Asa Ben-Hur	CSB 448	Monday, 10-11 am; Thursday, 1-2 pm
Tai Montgomery	Anatomy/Zoology E208	Wednesday, 3-4 pm

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Grading

Your grade for this course will be based on weekly assignments and a final exam. The percentages are as follows:

- Assignments: 75%
- Final exam: 25%

The calculation of the final letter grade will be made as follows:

- A 90 - 100%
- B 80 - 89.9%
- C 70 - 79.9%
- D 60 - 69.9%
- F below 60%

These ranges for a letter grade might be shifted a little lower, but will not be raised.

Programs and algorithms

- **Programming language**
  - A language designed to provide instructions to a computer.
  - Each language has specific syntax and semantics.
- **Program**
  - A set of instructions telling a computer exactly what to do.
- **Script**
  - A program, often relatively short and usually written in an interpreted language.
- **Algorithm**
  - A sequence of operations to be followed to solve a problem (independent of a specific programming language).

Programming languages

Programming languages commonly used in bioinformatics

Interpreted languages (slower but easier and often shorter):

- Python (Biopython)
- Perl (BioPerl)
- R (Bioconductor)
- MATLAB

Compiled languages (faster but more difficult):

- C
- C++
- Java

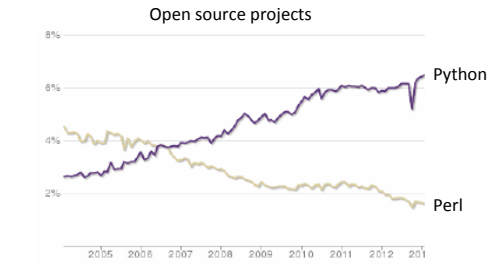
Why learn a programming language?

Why Python?

- Python uses **easy to read** syntax that is centered around spoken English words, as opposed to symbols – less cryptic syntax than most programming languages.
- Python is a high level **interpreted** language – code is processed at runtime by the Python interpreter (programs don't have to be compiled into the machine language before execution, in contrast to low level languages such as C).
- Python is a **great for beginners** as well as advanced programmers and has numerous applications from simple text processing and data analysis to website development.
- Lots of **resources** for general programing as well as computational biology.

Why Python?

Python is easily the top general purpose interpreted language



Andrew Binstock, 2014