Programming in Python

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Course contents

A programming course teaches —

- Language (fundamentals and semantics)
- Literature (examples, use of language features)
- Methodology (design, testing, version control, . . .)
- Foundations (computer science topics, . . .)

Python

Python is a general-purpose programming language that has achieved popularity in several different areas, especially —

- Scientific/technical computing
- Web applications
- Software tools

Context

Python is one of the *dynamic languages*:

- Tcl, Perl, Ruby, . . . , also MATLAB, Mathematica, . . . and of course Lisp, Scheme, . . .

Python is *unlike* the *statically typed languages*:

- C, C++, C#, Java, . . .

Felicities

Python has no one signature feature, no single unobvious innovation.

The well-deserved popularity seems to derive from the happy combination of many characteristics:

- Easy to read
- Gentle learning curve
- Enormous standard library, many other high-quality libraries
- Scales well
- Friendly to different programming styles
- Multi-platform
- Vigorous ecosystem

Fundamentals

Introduce the basics:

- Expressions, statements, control structure, functions
- Strings, files, URLs (web pages)
- Lists, dictionaries

Samples

In order of increasing depth and brilliance (but not length):

- Protein sequence analysis
- Traceroute
- Spelling corrector

Semantics

The most important features that distinguish Python (and some other dynamic languages) from statically types languages:

Variables are references (not containers)

Types are associated with values (not variables)

Compilation only checks syntax (types are checked at runtime)

Libraries and Applications

Survey some notable Python libraries and scriptable applications

Exercises

You can . . .

- Browse the tutorials and applications
- Fire up a Python session and play with the interpeter
- Download the samples, try the exercises
- Look over the textbook (online) and try some exercises