Bioinformatical problem solving with Python

Wednesdays 17:30-19:00, M801

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Aims of this seminar

- Get a general understanding of how programming languages work
- Learn to use Python as a general-purpose language
- Interactively discuss problems and potential solutions
- Ideally, apply skills to problems related to your own projects
- Alternatively, find problems on Rosalind: http://rosalind.info

Programming languages

```
def add5(x):
    return x+5

def dotwrite(ast):
    nodename = getNodename()
    label=symbol.sym_name.get(int(ast[0]),ast[0])
    print '    %s [label="%s' % (nodename, label),
    if isinstance(ast[1], str):
        if ast[1].strip():
            print '= %s"];' % ast[1]
        else:
            print '"]'
     else:
        print '"];'
        children = []
        for  in n, childenumerate(ast[1:]):
            children.append(dotwrite(child))
        print ,'    %s -> {' % nodename
        for  in :namechildren
            print '%s' % name,
```

Programming languages

Level of abstraction

R, Perl, Python, Bash

C++, Java

C, FORTRAN

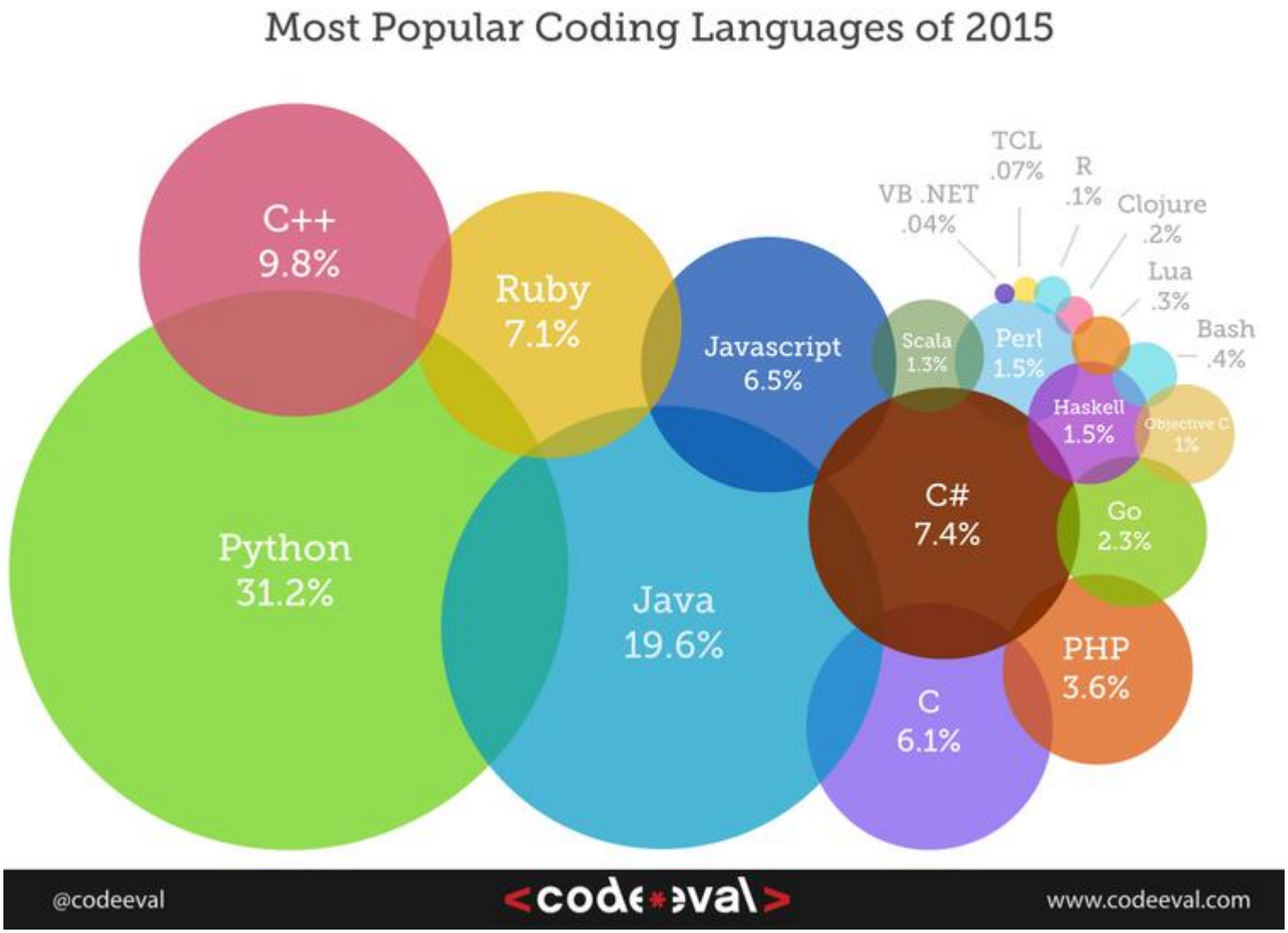
Assembly language

Machine language

Interpreted languages
'scripting languages'

Compiled languages

Why learning Python?



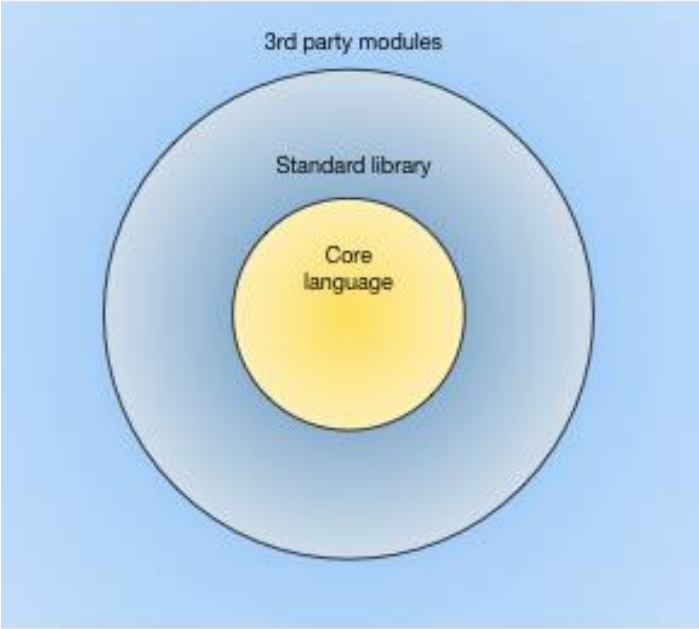
Why learning Python?

- Easy to learn, clear syntax
- Very flexible, from simple scripts to complex programs
- Very popular in scientific computing
- Jack of all trades, master of none
- Broad range of external packages
- Good plotting libraries

Which Python?

- Two lines of Python: Python 2.7.x and Python 3.6.x
- Differences in the syntax
- No backward compatibility
- We will learn Python 3, but not all external packages adapted yet.

Python ecosystem



- A text editor (e.g., gedit, emacs, vim)
- The Python interpreter
- A terminal application to run the interpreter in.

- Already preinstalled on most Linux-based OS.
- We will use Anaconda for easy package management: https://anaconda.org
- We will use Jupyter Notebook as digital lab book: http://jupyter.org (included in Anaconda)

- Official Python documentation: http://docs.python.org
- The Python tutorial: http://docs.python.org/tutorial