Python as the First Language

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HABIB UNIVERSITY
2014

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2014

Objectives of the first CS course

“This course aims to develop expertise in the fundamental techniques used in computer programming. Through the process of writing programs to solve problems, the students will develop a problem solving approach and comfort with a high level language.”

Objectives of the first CS course

- Problem solving
- Programming fundamentals
- High level language

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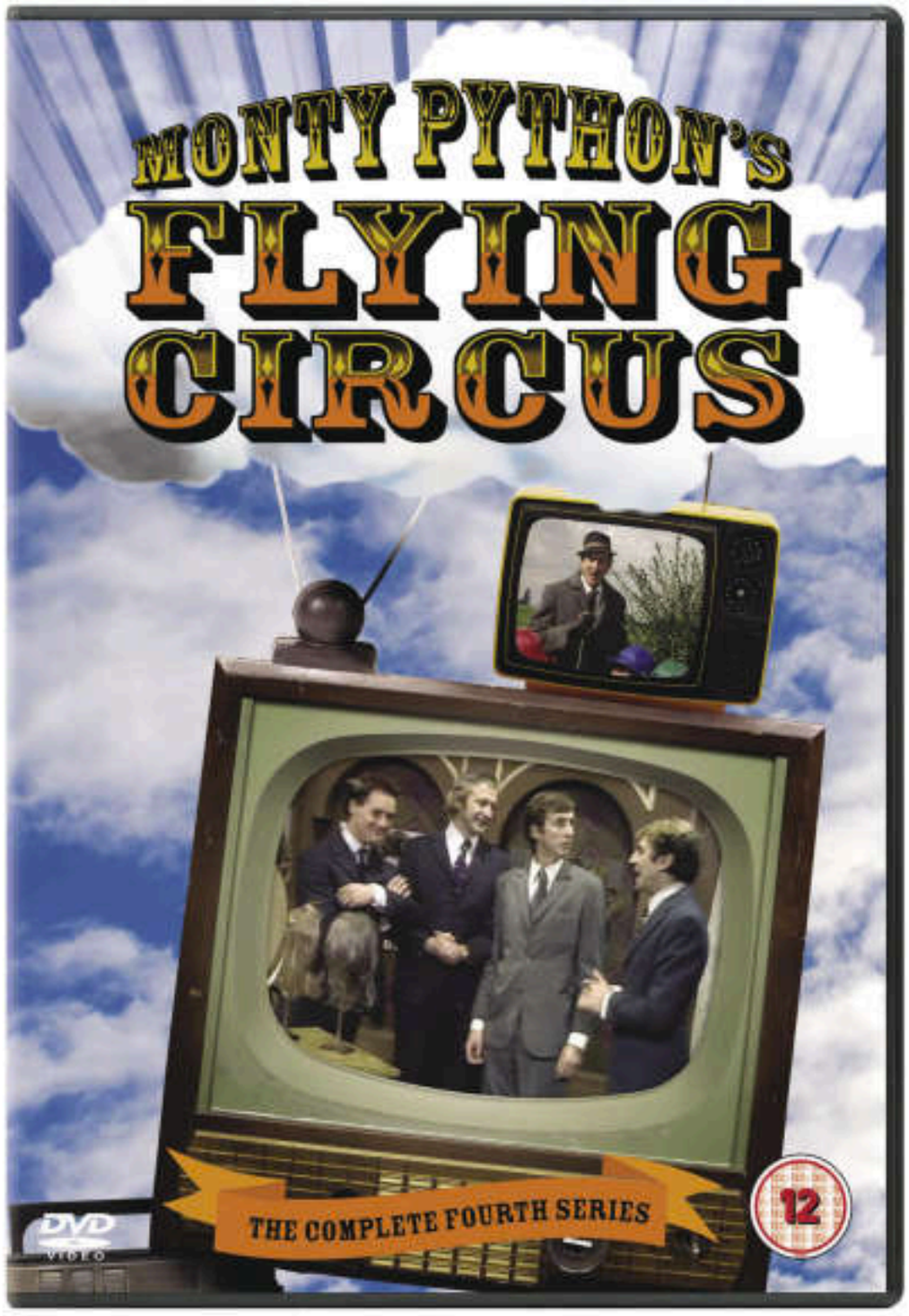
- **High level language**

python™

python.org

Wikipedia

python.org



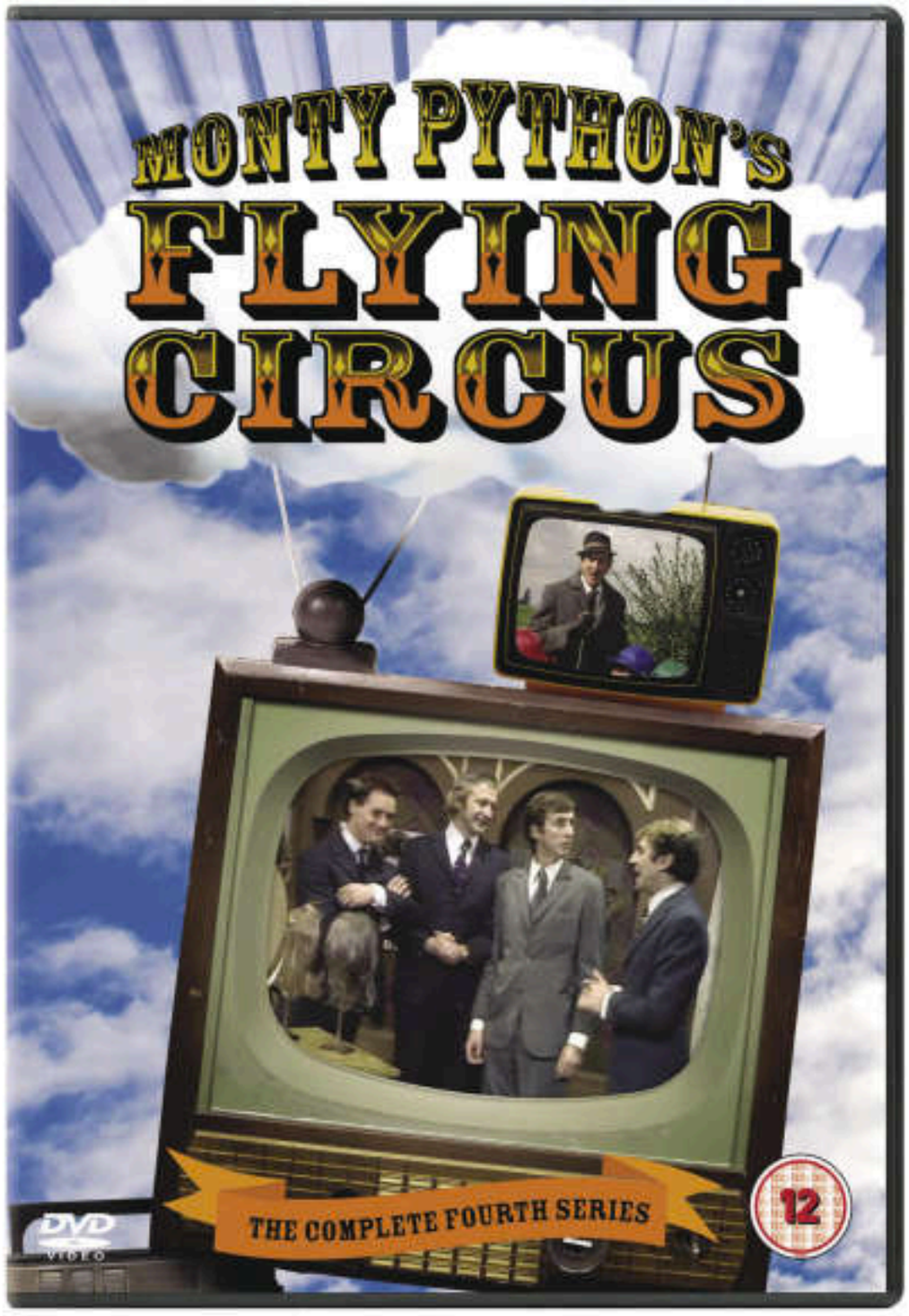
montypython.com

python™

python.org

“An important goal of Python's developers is keeping it fun to use. This is reflected in the language's name—a tribute to the British comedy group Monty Python—and in occasionally playful approaches to tutorials and reference materials”

–Wikipedia



montypython.com

Zen of Python

```
>>> import this
The Zen of Python, by Tim Peters

Beautiful is better than ugly.
Explicit is better than implicit.
Simple is better than complex.
Complex is better than complicated.
Flat is better than nested.
Sparse is better than dense.
Readability counts.
Special cases aren't special enough to break the rules.
Although practicality beats purity.
Errors should never pass silently.
Unless explicitly silenced.
In the face of ambiguity, refuse the temptation to guess.
There should be one-- and preferably only one --obvious way to do it.
Although that way may not be obvious at first unless you're Dutch.
Now is better than never.
Although never is often better than *right* now.
If the implementation is hard to explain, it's a bad idea.
If the implementation is easy to explain, it may be a good idea.
Namespaces are one honking great idea -- let's do more of those!
```

codeitsmartly.com/

JAVA **VS** **PYTHON**

```java
public class JavaPyramid1 {

    public static void main(String[] args) {

        for(int i=1; i<= 5 ;i++){

            for(int j=0; j < i; j++){
                System.out.print("*");
            }

            //generate a new line
            System.out.println("");
        }
    }
}
```

```python
def create_pyramyd(rows):
    for i in range(rows):
        print('*' * (i+1))
```

quora.com

UMBC
AN HONORS UNIVERSITY IN MARYLAND

Python vs C++ Syntax

Python

```
print "Hello, world"
quotient = 3 / 4
if quotient == 0:
    print "3/4 == 0",
    print "in Python"
else:
    print "3/4 != 0"
```

C++

```
#include <iostream>
using namespace std;

int main() {
  int quotient;
  cout << "Hello, world";
  quotient = 3 / 4;
  if (quotient == 0) {
    cout << "3/4 == 0";
    cout << " in C++";
  } else {
    cout << "3/4 != 0";
  }
  return 0;
}
```

www.umbc.edu

"Hello, World"

- C

```
#include <stdio.h>

int main(int argc, char ** argv)
{
   printf("Hello, World!\n");
}
```

- Java

```
public class Hello
{
   public static void main(String argv[])
   {
      System.out.println("Hello, World!");
   }
}
```

- now in Python

```
print "Hello, World!"
```

2

Monday, June 14, 2010

quora.com

Tweets by @ThePSF

Python Software
@ThePSF
Congrats Django Girls Jos! Glad @ThePSF could help sponsor your event!
28m

Python Software
@ThePSF

PEP 206 -- Python Advanced Library

PEP:	206
Title:	Python Advanced Library
Author:	A.M. Kuchling <amk at amk.ca>

Batteries Included Philosophy

The Python source distribution has long maintained the philosophy of "batteries included" -- having a rich and versatile standard library which is immediately available, without making the user download separate packages. This gives the Python language a head start in many projects.

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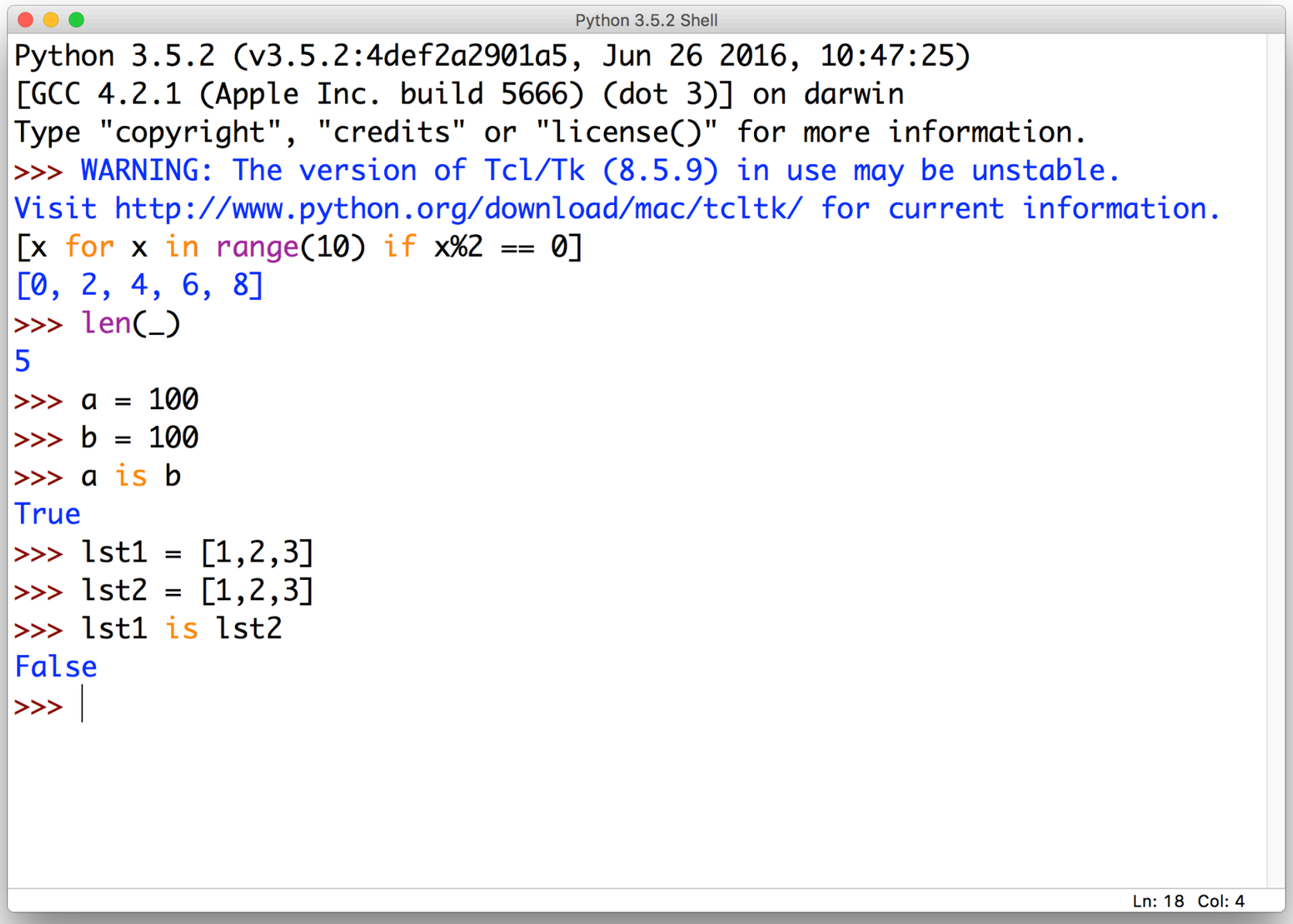

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- Creators
- Ratings and Reviews

Learn to Program: The Fundamentals

Enroll
Started Nov 20

About this course: Behind every mouse click and touch-screen tap, there is a computer program that makes things happen. This course introduces the fundamental building blocks of programming and teaches you how to write fun and useful programs using the Python language.

Who is this class for: This course is primarily aimed at first-year university students and high school students who want to learn how to program.

Created by: University of Toronto

UNIVERSITY OF TORONTO

Taught by: Jennifer Campbell, Associate Professor, Teaching Stream
Department of Computer Science

pythontutor.com

Here's a live example:

Python 2.7

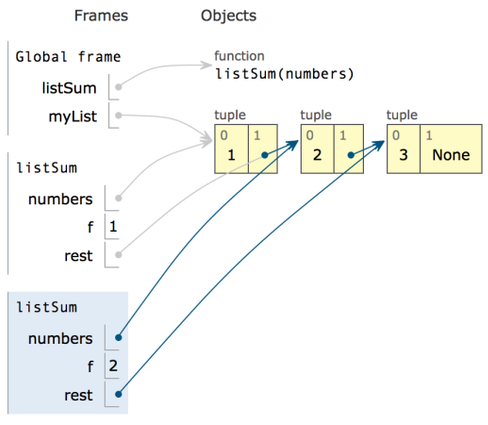
```
1  def listSum(numbers):
2    if not numbers:
3      return 0
4    else:
5      (f, rest) = numbers
6      return f + listSum(rest)
7
8  myList = (1, (2, (3, None)))
9  total = listSum(myList)
```

Edit code

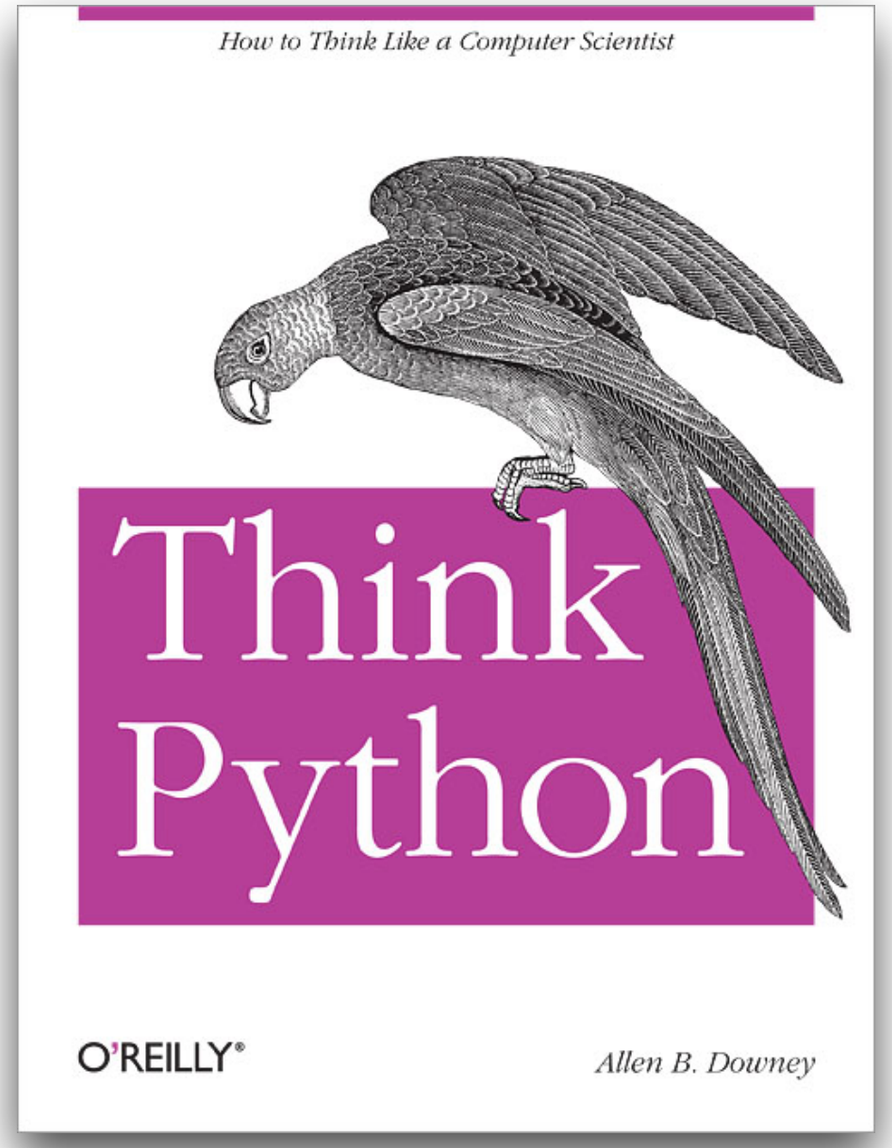
line that has just executed
next line to execute

< Back Step 11 of 22 Forward >

Visualized using Python Tutor by Philip Guo (@pgbovine)



Read the research paper – Philip J. Guo. Online Python Tutor: Embeddable Web-Based Program Visualization for CS Education. SIGCSE 2013.



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BLOG@CACM

Python is Now the Most Popular Introductory Teaching Language at Top U.S. Universities

By Philip Guo

July 7, 2014

Comments (12)

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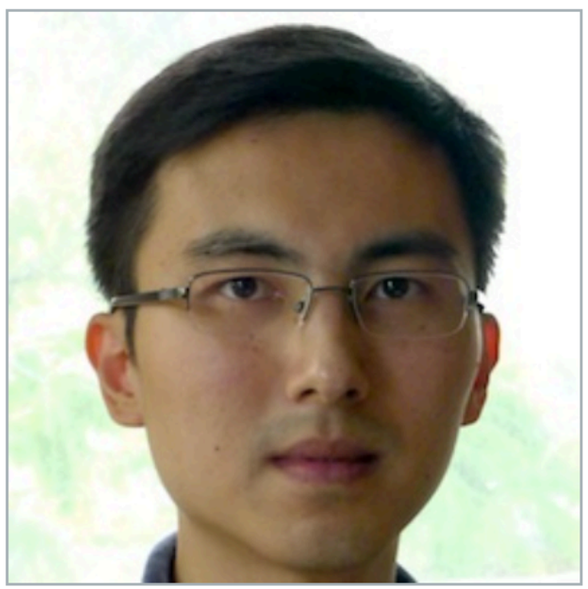

Summary

At the time of writing (July 2014), Python is currently the most popular language for teaching introductory computer science courses at top-ranked U.S. departments.

Specifically, eight of the top 10 CS departments (80%), and 27 of the top 39 (69%), teach Python in introductory CS0 or CS1 courses.

Motivation

Python has been getting more popular as the first language to teach novices. Three years ago, Mark Guzdial blogged about the rise of Python as a teaching language and predictions for future teaching languages. Top-ranked CS departments at MIT and UC Berkeley recently switched their introductory courses to Python. The largest

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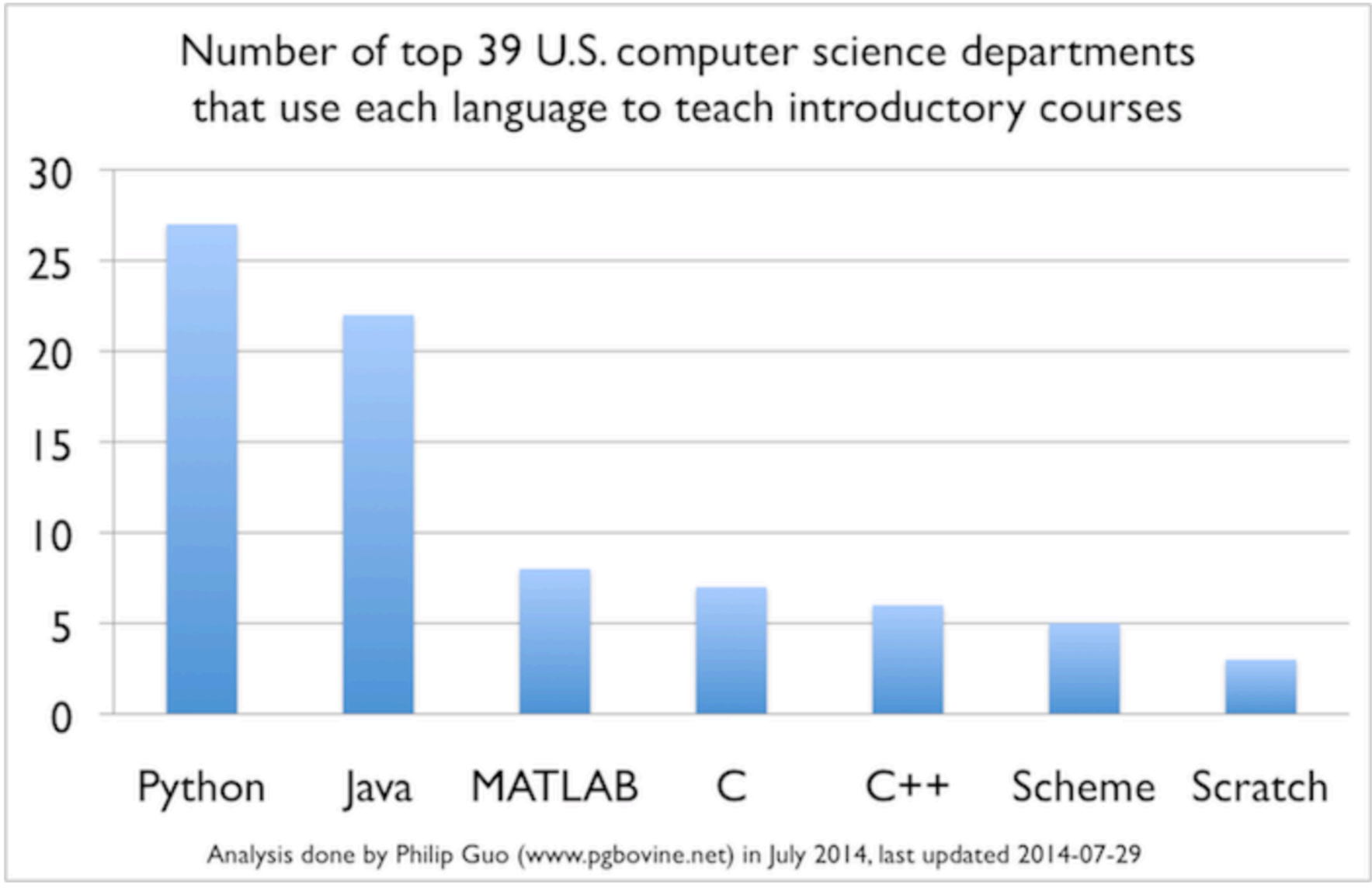
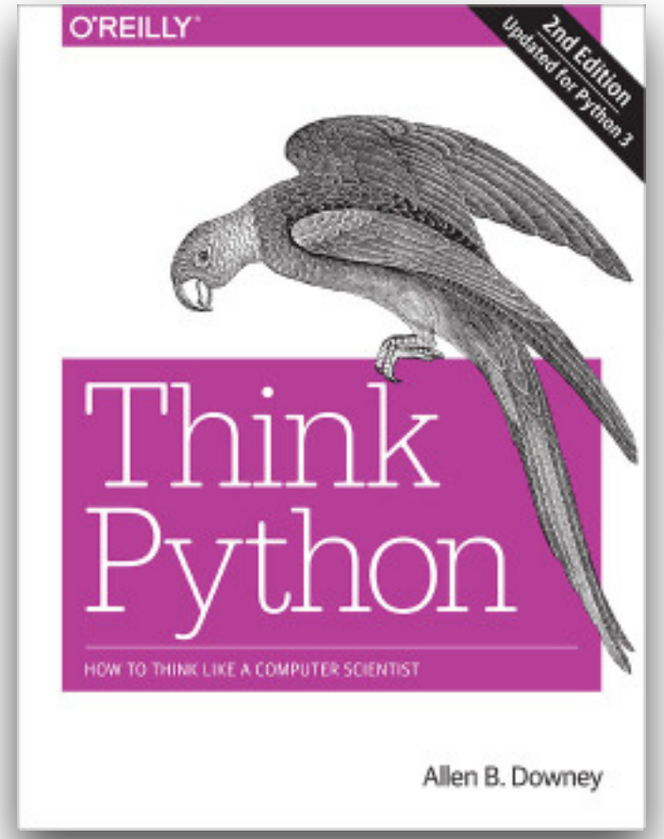
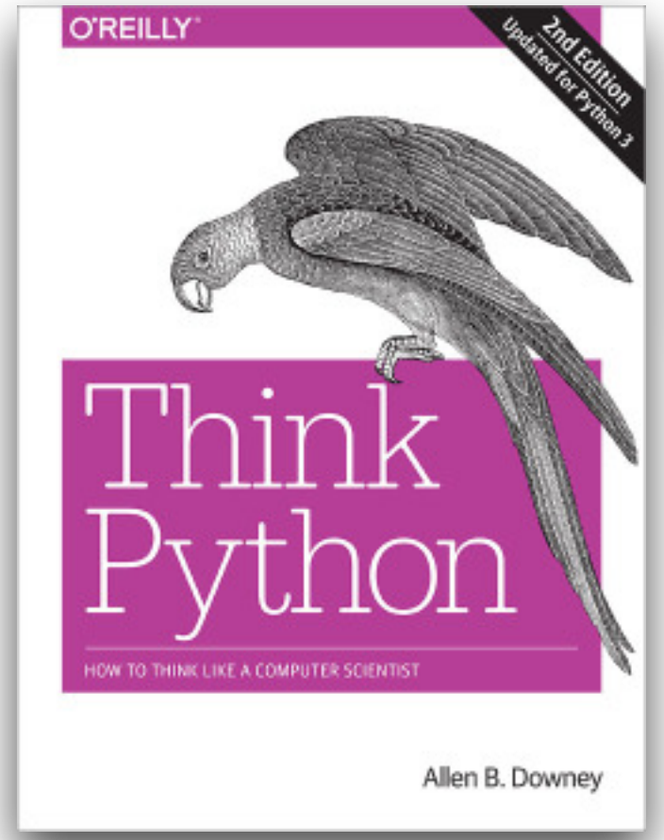

Number of top 39 U.S. computer science departments
that use each language to teach introductory courses
30
25
20
15
10
5
0
Python
Java
MATLAB
C
C++
Scheme
Scratch
Analysis done by Philip Guo (www.pgbovine.net) in July 2014, last updated 2014-07-29



pythonanywhere

```
Python 3.5.2 Shell
Python 3.5.2 (v3.5.2:4def2a2901a5, Jun 26 2016, 10:47:25)
[GCC 4.2.1 (Apple Inc. build 5666) (dot 3)] on darwin
Type "copyright", "credits" or "license()" for more information.
>>> WARNING: The version of Tcl/Tk (8.5.9) in use may be unstable.
Visit http://www.python.org/download/mac/tcltk/ for current information.
[x for x in range(10) if x%2 == 0]
[0, 2, 4, 6, 8]
>>> len(_)
5
>>> a = 100
>>> b = 100
>>> a is b
True
>>> lst1 = [1,2,3]
>>> lst2 = [1,2,3]
>>> lst1 is lst2
False
>>>
Ln: 18  Col: 4
```



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