



python :
powered



python

Administration

- Instructor:
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 - <http://wccclab.cs.nchu.edu.tw/www/index.php/course>
- Office Hours:
 - (Wednesday) 14:00~16:00
- Grade:
 - Homework 40%
 - Computer-based Test 30%
 - Final Project 30 %

Outline

1. Python introduction and operation
2. Python statement and data structure
3. Function and module
4. Input and output
5. Errors and exception
6. Objects and classes
7. Python GUI Programming
8. Python Network Programming
9. Thread
10. Python implement Mechanical Learning
11. Demo for final project

Introductory

- Raise your hand is always welcome!
- No phone, walk, sleep, and late during the lecture time.
- Slides are not enough. To master the materials, page-by-page reading is necessary.
- Do not copy the homework.

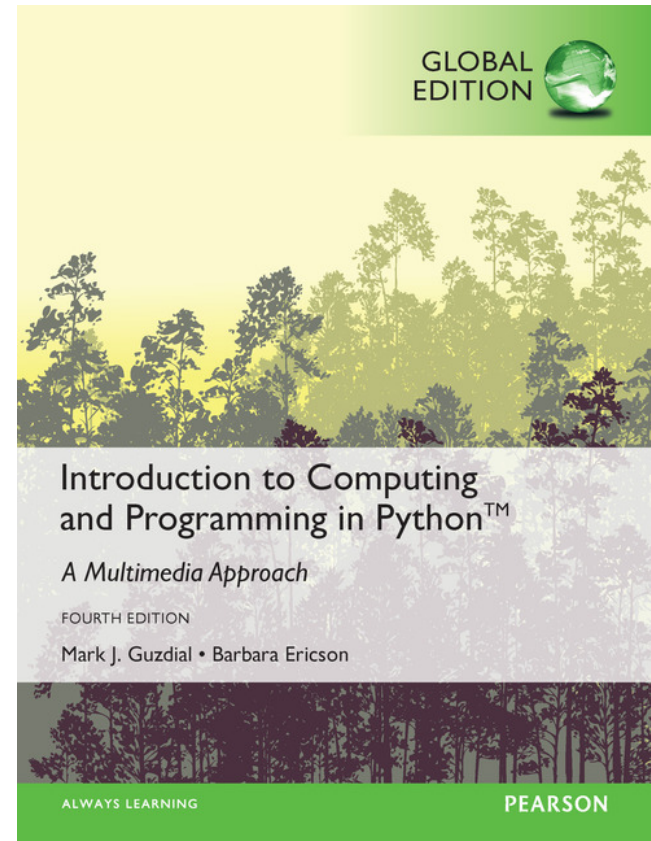
Reference Book

- Fundamentals of Python: First Programs, “Kenneth A. Lambert”, International Edition, ISBN: 1111822700



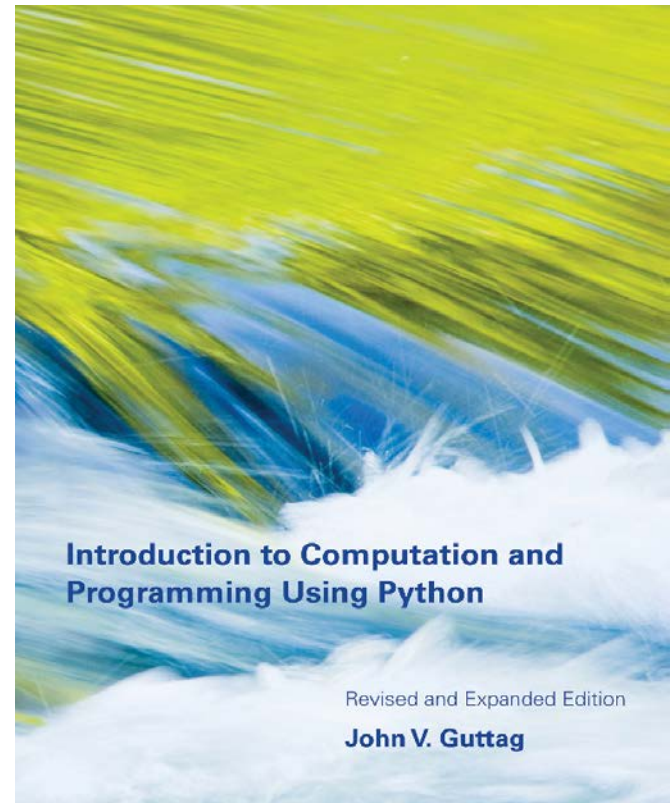
Reference Book

- Introduction to Computing and Programming in Python, “Mark J. Guzdial, Barbara Ericson”, Global Edition (4e), ISBN: 9781292109862



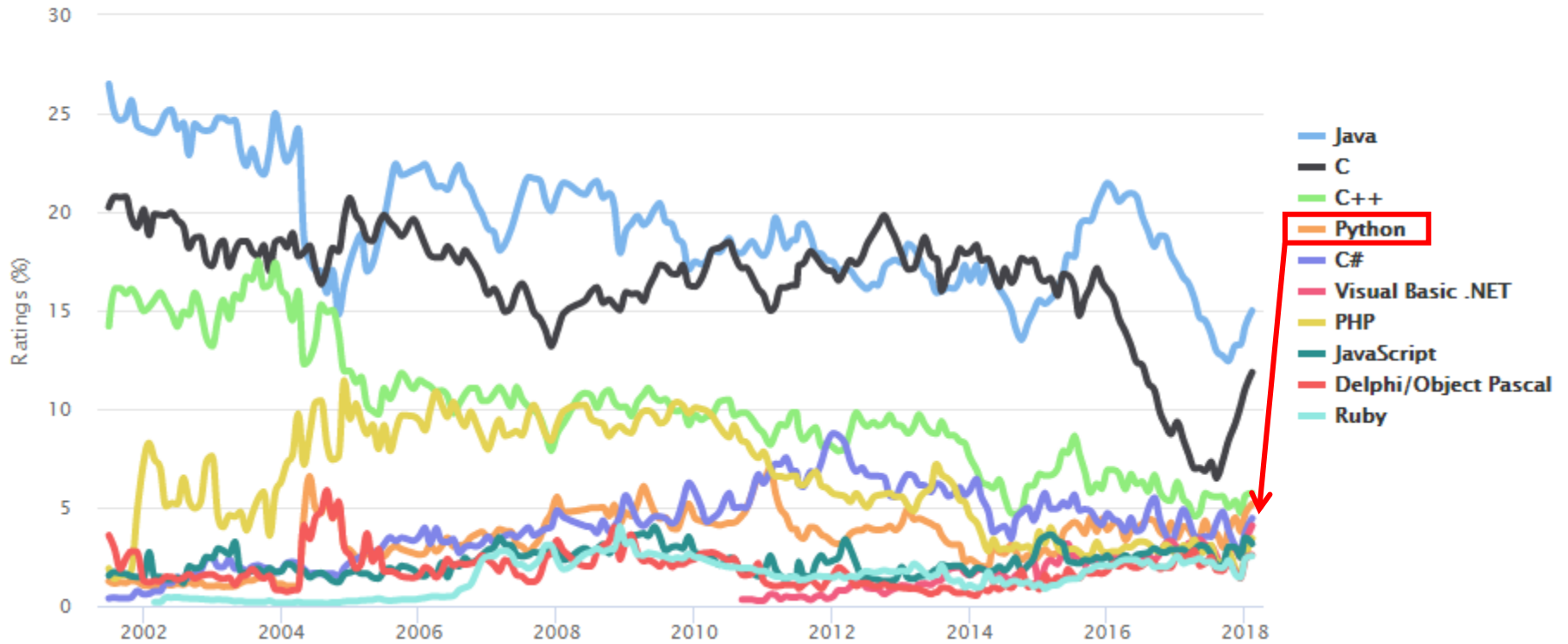
Reference Book

- Introduction to Computation and Programming Using Python, " John V. Guttag ", Revised And Expanded Edition, ISBN: 9780262316644



TIOBE Programming Community Index

Source: www.tiobe.com



Feb 2018	Feb 2017	Change	Programming Language	Ratings	Change
1	1		Java	14.988%	-1.69%
2	2		C	11.857%	+3.41%
3	3		C++	5.726%	+0.30%
4	5	▲	Python	5.168%	+1.12%
5	4	▼	C#	4.453%	-0.45%
6	8	▲	Visual Basic .NET	4.072%	+1.25%
7	6	▼	PHP	3.420%	+0.35%
8	7	▼	JavaScript	3.165%	+0.29%
9	9		Delphi/Object Pascal	2.589%	+0.11%
10	11	▲	Ruby	2.534%	+0.38%
11	-	▲▲	SQL	2.356%	+2.36%
12	16	▲▲	Visual Basic	2.177%	+0.30%
13	15	▲	R	2.086%	+0.16%
14	18	▲▲	PL/SQL	1.877%	+0.33%
15	13	▼	Assembly language	1.833%	-0.27%

History

Programming Language	2018	2013	2008	2003	1998	1993	1988
Java	1	2	1	1	18	-	-
C	2	1	2	2	1	1	1
C++	3	4	3	3	2	2	5
Python	4	7	6	12	26	16	-
C#	5	5	7	9	-	-	-
Visual Basic .NET	6	13	-	-	-	-	-
JavaScript	7	9	8	7	21	-	-
PHP	8	6	4	5	-	-	-
Perl	9	8	5	4	3	11	-
Ruby	10	10	9	19	-	-	-
Objective-C	18	3	45	47	-	-	-
Ada	28	15	17	14	7	7	2
Lisp	31	12	14	13	6	4	3
Pascal	136	14	19	97	11	3	13



Python

- Simple
 - Python is a simple and minimalistic language in nature
 - Reading a **good** python program should be like reading English
 - Its Pseudo-code nature allows one to concentrate on the problem rather than the language
- Easy to Learn
- Free & Open source
 - Freely distributed and Open source
 - Maintained by the Python community
<http://www.python.org/community/>
- High Level Language – memory management
- Portable – runs on anywhere and combine with c code



Python

- Interpreted
 - You run the program straight from the source code.
 - Python program → Bytecode → a platform's native language
 - You can just copy over your code to another system and it will automatically work with python platform
- Object-Oriented
 - Simple and additionally supports procedural programming
- Extensible – easily import other code
- Embeddable – easily place your code in non-python programs
- Extensive libraries
 - (i.e. reg. expressions, doc generation, CGI, ftp, web browsers, ZIP, WAV, cryptography, etc...) (wxPython, Twisted, Python Imaging library)



Python Timeline/History



- Python was conceived in the late 1980s.
 - Guido van Rossum (吉多·范羅蘇姆),
 - Benevolent Dictator For Life (仁慈獨裁者)
 - Rossum is Dutch, born in Netherlands
 - Descendant of ABC, he wrote glob() func in UNIX
 - M.D. @ U of Amsterdam, worked for CWI, NIST, CNRI, **Google**
 - Also, helped develop the ABC programming language
 - Monty Python's Flying Circus (蒙提·派森的飛行馬戲團)
- In 1991 python 0.9.0 was published and reached the masses through alt.sources
 - The alt.sources newsgroup is intended to be a repository for source-code of all sorts that people wish to distribute and share with other people.



Python Timeline/History

- In January of 1994 python 1.0 was released
 - Functional programming tools like lambda, map, filter, and reduce
 - comp.lang.python formed, greatly increasing python's user base
- In 1995, python 1.2 was released.
- By version 1.4 python had several new features
 - Keyword arguments (similar to those of common lisp)
 - Built-in support for complex numbers
 - Basic form of data-hiding through name mangling (easily bypassed)
 - private, protected, public
- Computer Programming for Everybody initiative
 - Make programming accessible to more people, with basic “literacy” similar to those required for English and math skills for some jobs.
 - Project was funded by DARPA (Defense Advanced Research Projects Agency)



Python Timeline/History

- In 2000, Python 2.0 was released.
 - Introduced list comprehensions similar to Haskell
 - Haskell is a modern functional language (like lisp)
 - Introduced garbage collection
- In 2001, Python 2.2 was released.
 - Included unification of types and classes into one hierarchy, making python's object model purely object-oriented
 - Generators were added (function-like iterator behavior)
 - **iterator** is an object that enables a programmer to traverse a container.
- Standards
 - <http://www.python.org/dev/peps/pep-0008/>

Version Release Dates

- Python 1.0 - January 1994
 - Python 1.5 - December 31, 1997
 - Python 1.6 - September 5, 2000
- Python 2.0 - October 16, 2000
 - Python 2.1 - April 17, 2001
 - Python 2.2 - December 21, 2001
 - Python 2.3 - July 29, 2003
 - Python 2.4 - November 30, 2004
 - Python 2.5 - September 19, 2006
 - Python 2.6 - October 1, 2008
 - Python 2.7 - July 3, 2010
- Python 3.0 - December 3, 2008
 - Python 3.1 - June 27, 2009
 - Python 3.2 - February 20, 2011
 - Python 3.3 - September 29, 2012
 - Python 3.4 - March 16, 2014
 - Python 3.5 - September 13, 2015
 - Python 3.6 - December 23, 2016

Python Taiwan

<https://www.facebook.com/groups/pythontw/10152295869513438/>

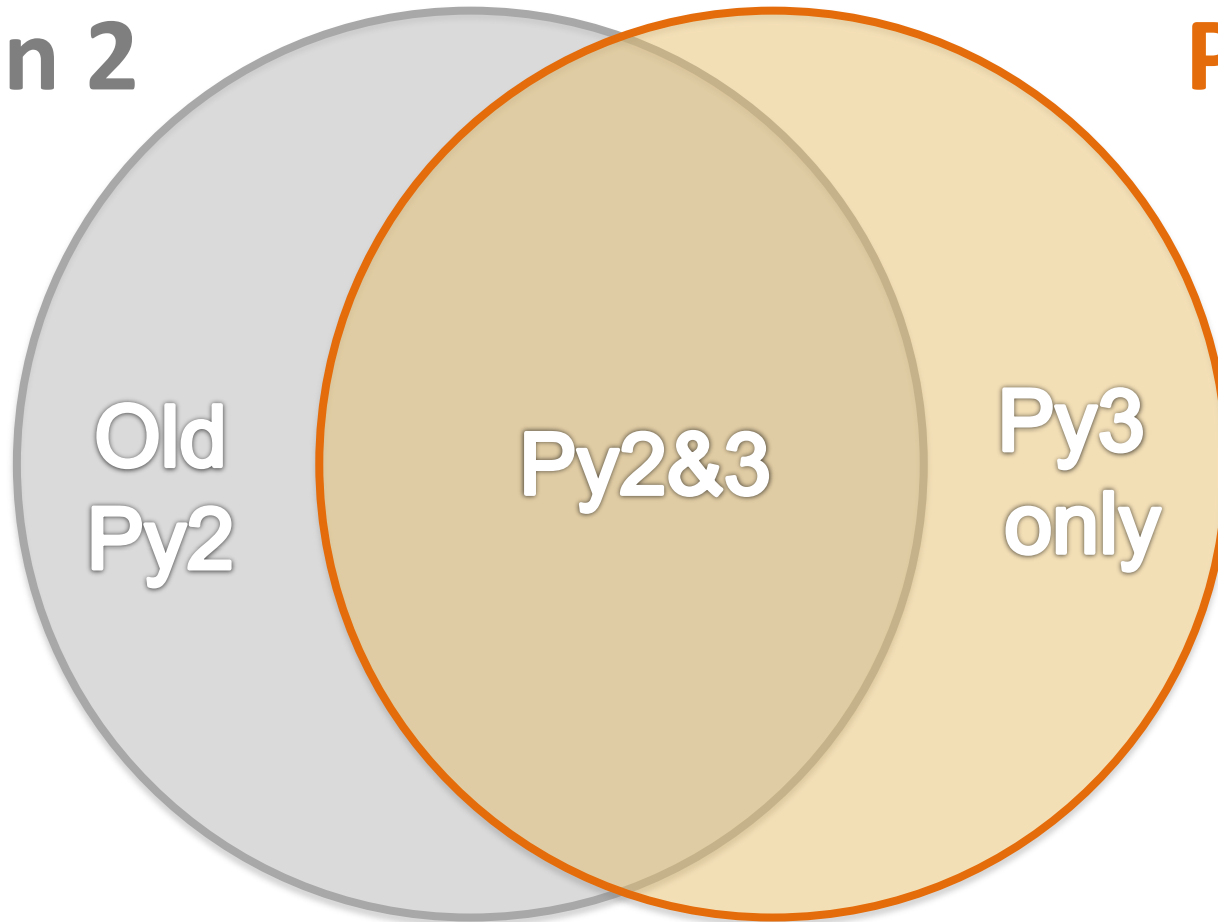
Python (Python 2.7 & Python 3.6)



Standard Syntax

Python 2

Python 3



Source: PyCon Australia (2014), Writing Python 2/3 compatible code by Edward Schofield

<https://www.youtube.com/watch?v=KOqk8j11aAI>

Running Python

- There are **three** different ways to start Python:

(1) Interactive Interpreter:

- You can enter **python** and start coding right away in the interactive interpreter by starting it from the command line.

```
$python          # Unix/Linux  
  
or  
  
python$        # Unix/Linux  
  
or  
  
C:>python      # Windows/DOS
```

Interactive Interpreter

- Here is the list of all the available command line options:

Option	Description
-d	provide debug output
-O	generate optimized bytecode (resulting in .pyo files)
-S	do not run import site to look for Python paths on startup
-v	verbose output (detailed trace on import statements)
-X	disable class-based built-in exceptions (just use strings); obsolete starting with version 1.6
-c cmd	run Python script sent in as cmd string
file	run Python script from given file

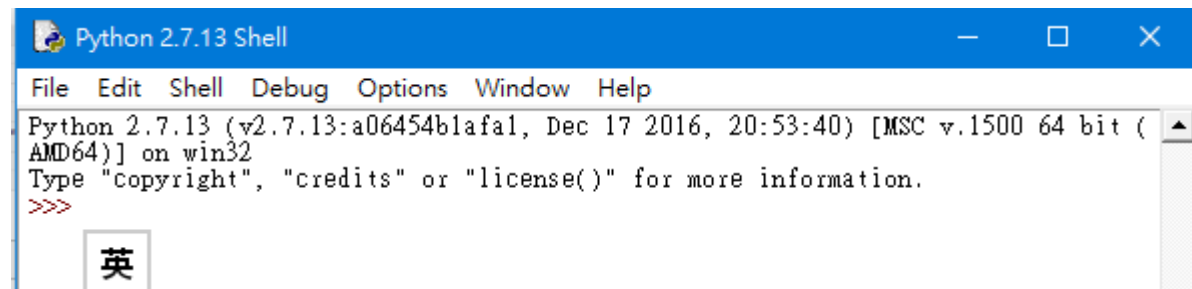
Script from the Command-line

- A Python script can be executed at **command line** by invoking the interpreter on your application, as in the following:

```
$python script.py          # Unix/Linux  
  
or  
  
python% script.py         # Unix/Linux  
  
or  
  
C:>python script.py      # Windows/DOS
```

Integrated Development Environment (IDE)

- You can run Python from a graphical user interface (GUI) environment as well.
 - All you need is a GUI application on your system that supports Python.
- **Unix:** IDLE is the very first Unix IDE for Python.
- **Windows:** PythonWin is the first Windows interface for Python and is an IDE with a GUI.
- **Macintosh:** The Macintosh version of Python along with the IDLE IDE is available from the main website, downloadable as either MacBinary or BinHex'd files.



```
Python 2.7.13 Shell
File Edit Shell Debug Options Window Help
Python 2.7.13 (v2.7.13:a06454b1afa1, Dec 17 2016, 20:53:40) [MSC v.1500 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
```

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INSTALL ANACONDA

- **DOWNLOAD ANACONDA**
- <https://www.continuum.io/downloads>

Anaconda 5.1 For Windows Installer

Python 3.6 version *

 Download

[64-Bit Graphical Installer \(537 MB\)](#) 

[32-Bit Graphical Installer \(436 MB\)](#)

Python 2.7 version *

 Download

[64-Bit Graphical Installer \(523 MB\)](#) 

[32-Bit Graphical Installer \(420 MB\)](#)

[Behind a firewall?](#)

[How to get Python 3.5 or other Python versions](#)

[How to Install ANACONDA](#)