

Theory of Algorithms

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Python

About Python

January 1994 – Python 1.0.0 released.

Guido van Rossum – Designer/Author of Python.

Current versions – 3.5.1 and 2.7.11.

Interpreted – Python implementation must be present at runtime.

Off-side rule – Blocks identified by indentation, as opposed to curly braces.

Popularity – IEEE Spectrum ranks it as the fourth most popular language (July 2015).

Community – Python Enhancement Proposals, notably PEP 8: The Python Style Guide.



- Started Python as a hobby.
- Worked for Google, half-time spent on Python.
- Now works at Dropbox.
- Benevolent dictator for life (BDFL).

```
1  x = int(raw_input("Please enter an integer: "))
2  if x < 0:
3      x = 0
4      print 'Negative changed to zero'
5  elif x == 0:
6      print 'Zero'
7  elif x == 1:
8      print 'Single'
9  else:
10     print 'More'
```

Loops

```
1 # A for loop.  
2 a = ['Mary', 'had', 'a', 'little', 'lamb']  
3 for i in range(len(a)):  
4     print i, a[i]
```

```
1 # A while loop.  
2 a, b = 0, 1  
3 while b < 1000:  
4     print b,  
5     a, b = b, a+b
```

docs.python.org/2/tutorial

```
1 # write Fibonacci series up to n
2 def fib(n):
3     """Print a Fibonacci series up to n."""
4     a, b = 0, 1
5     while a < n:
6         print a,
7         a, b = b, a+b
```

Reference implementation – Many different Python implementations exist.

Version 3 – Broke backwards compatibility (somewhat).

Unladen Swallow – Google attempt to fix some Python problems.

Modules – Lots of great Python modules available.

Timing Algorithms

Functional Programming

Turing Machines

Complexity Classes