

# Python: One Language to Script Them All

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# Another Language?

- ▶ Python was invented in 1991 by Guido van Rossum
  - Named after the comedy troupe, not the snake
- ▶ Simple
  - They all say that! But here's a complete program:  

```
print "Python Rocks!"
```
- ▶ Large standard library
- ▶ Huge list of extensions available
- ▶ Several implementations (C, Jython, .Net, Py)
- ▶ ***Often the best way to get stuff done***

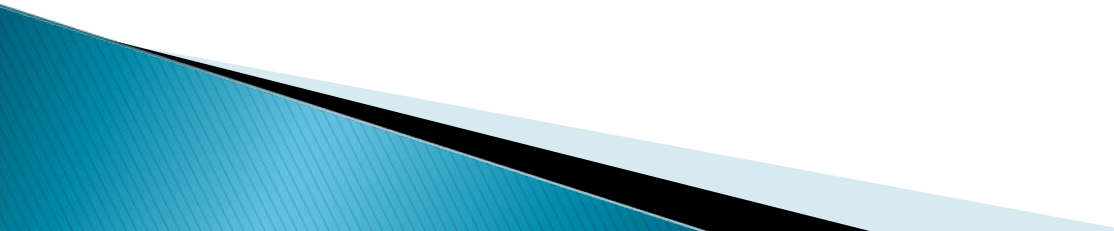
# Anybody *really* using it?

- ▶ NASA
- ▶ YouTube.com
- ▶ Rackspace (big web hosting company)
- ▶ ILM (George Lucas' special FX company)
- ▶ Ubuntu install system
- ▶ Honeywell
- ▶ Many more
  - See <http://www.python.org/about/success/>

# Python vs shell scripting

- ▶ Fewer syntax rules
  - No \$ on variables  
line="hello world"  
print line
- ▶ More functionality in language
- ▶ Will usually run faster, sometimes much faster
- ▶ Reliable error handling
  - try/except/finally

# Python vs C

- ▶ Almost as fast at run time, and *much* faster to write
  - ▶ Much easier to debug
    - No pointer arithmetic!
    - Always a readable stack trace
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# Python vs Perl

- ▶ Perl's syntax is horrible
  - Even Larry Wall admits this, doesn't care
- ▶ Perl: There's More Than One Way to Do It
- ▶ Python: There's one good way to do
- ▶ Eric Raymond (noted open source author) moved from Perl to Python
  - “writing working code in 30 minutes”
  - See <http://www.python.org/about/success/esr/>
- ▶ Runs faster for at least some applications

# Python and Java

- ▶ Many similarities
  - Operators
  - Division between language & library
  - Each invented by one genius designer
  - Both use try/catch/finally (Python try/except/finally)
- ▶ Easier to code (usually)
- ▶ Jython (formerly JPython) integrates both
  - Run Python in JVM, call between Java & Python code

# The #1 Minor Syntax Issue

**Indentation  
matters**

# Syntax Features

- ▶ No variable declarations – just assign
- ▶ Built-in support for lists/arrays etc.
  - `xx = [ 2, 5, 'Snake' ]`
  - `len(xx) # prints 3`
  - `xx[2] # prints 'Snake'`
  - `xx[1:3] # 'slice', prints [5, 'Snake']`
  - Tuple (with `()` instead of `[]`) - immutable list
- ▶ Maps:
  - `yy = { 'ian':42, 'jo':123 }`
  - `yy['ian'] # prints 42`

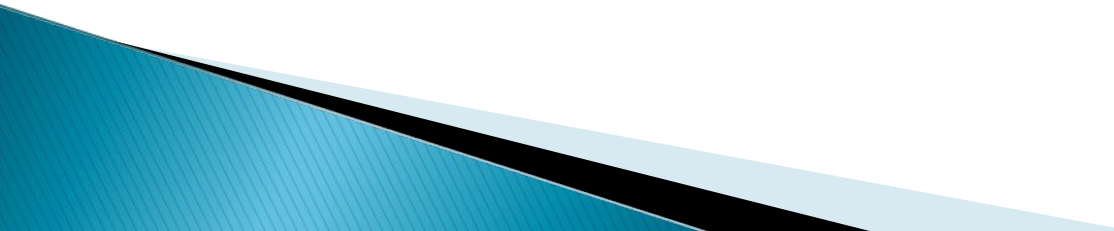
# fmt.py (complete program)

```
#!/usr/bin/env python
import sys
linelength = 72
out = ""
for line in sys.stdin.readlines():
    if len(line) == 0:    # null line
        print ""
        if out:
            print out
            out = ""
    else:
        for word in line.split():
            out += word + ' '
            if (len(out) > linelength):
                print out
                out = ""
if out:
    print out
```

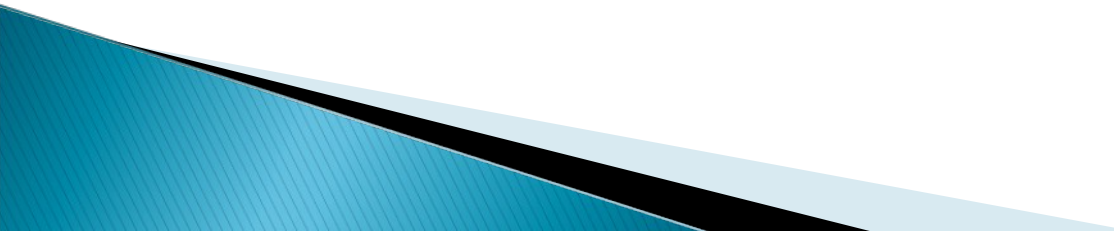
# Python is Object-Oriented

- ▶ Full support for classes, inheritance, polymorphism, etc.
- ▶ No need to write setters/getters
- ▶ Operator overloading
- ▶ Result:
  - Supports building large applications

# Built-in library

- ▶ A complete web server base class
  - ▶ Operating system dependencies
  - ▶ UNIX configuration info
  - ▶ Tkintr – complete GUI library
  - ▶ Easily interfaced to existing code
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# Free add-in libraries

- ▶ Web Site frameworks
    - TurboGears, Django, Zope, several others
    - Content Management: Plone
  - ▶ NumPy advanced numeric algorithms
  - ▶ Support for all common databases
  - ▶ etc!
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# Resources

- ▶ <http://www.python.org/>
- ▶ <http://www.darwinsys.com/python/>
- ▶ Books: *Dive Into Python* (free PDF, buy print)
- ▶ *Python Cookbook* – thousands of recipes online, buy printed book with “top” selection
- ▶ Large user community
- ▶ PyCon – yearly in US and in EU
  - And specialized Python-for-whatever cons too!
- ▶ Local User Groups
  - Toronto: [pygta.org](http://pygta.org)

# Closing Thought - Python

Try it, you'll probably like it!

