Python:
One Language
to Rule Them All

Ian Darwin

https://darwinsys.com/python

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 to choose from

Often the best way to get stuff done

Who's using Python?

NASA

YouTube.com

Rackspace (big web hosting company)

ILM (George Lucas' special FX company)

Ubuntu install system

Lots of Data Science and similar

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
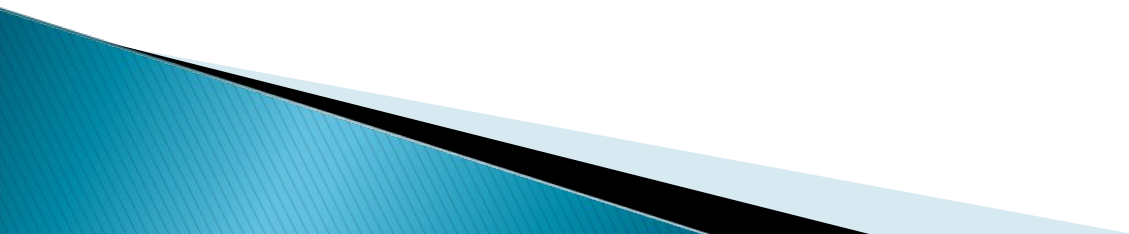
Reliable error handling
- try/catch

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

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
- Error handling: try/except/finally, try/catch/finally

Python easier to code (usually)
- print() vs System.out.println()

Jython (formerly JPython) integrates both
- Run Python in JVM, call between Java & Python code
- Works even better with GraalVM

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)

```python
#!/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)
```
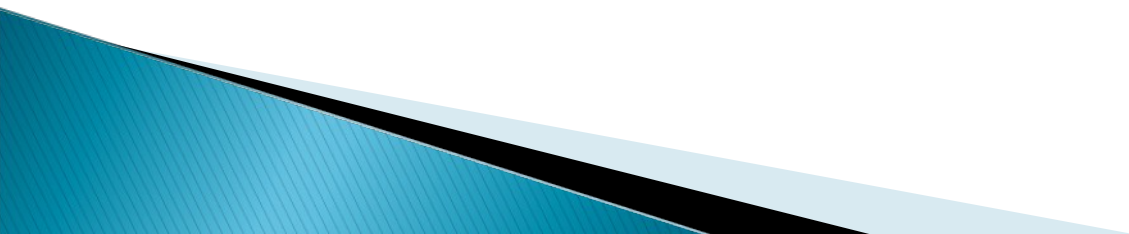
Python is Object-Oriented

Full support for classes, inheritance, polymorphism, etc.

No need to write setters/getters

Operator overloading

Result:

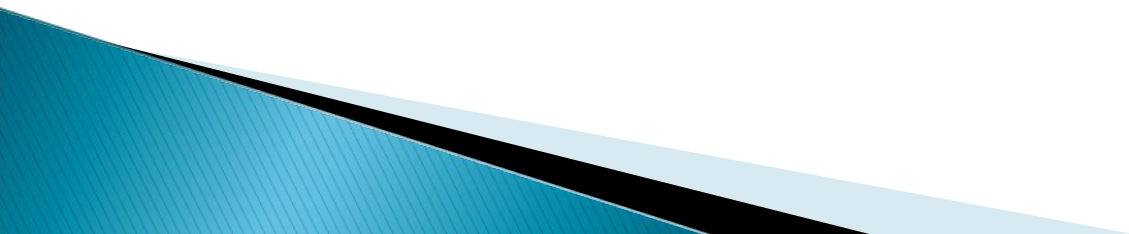- Supports building large applications

Built-in library

A complete web server base class
Operating system dependencies
UNIX configuration info
Tkintr and PyGTK – complete GUI libraries
Easily interfaced to existing code

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!

Resources

https://python.org/

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 US (pycon.org), Canada (pycon.ca) and EU

And specialized Python-for-whatever cons too!

Local User Groups

Toronto: pythontoronto.com

Closing Thought - Python

Try it, you'll probably like it!