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Introduction to Python

This module introduces the Python programming language. It's written for readers with some prior programming knowledge who are looking to learn about Python for use in their work.

191.1 What is Python?

Python is a programming language. It's available at no charge and it runs on many different platforms. It has a simple syntax, and yet it can be used for a wide range of applications.

191.2 Running Python from the command line

Python is a scripting language. That means that you can enter your commands into a plain text file and run them straight from that file without the need for any intermediate conversion into "object files", "class files" or "executable files. It also means that you can call python from the command line, enter commands one-by-one, and have them execute right away.

```
coffee% python
Python 2.3 (#1, Sep 13 2003, 00:49:11)
[GCC 3.3 20030304 (Apple Computer, Inc. build 1495)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> base = 20
>>> height = 35.72
>>> area = base * height
>>> print area
714.4
>>> ^D
coffee%
```

You'll notice that Python can be written one command per line, that variables can be used without being declared, and that there's no ";" or "." character to indicate the end of a command – all subjects which we'll study in much more detail later.

To exit from Python, we entered **control-D** on the keyboard. That's the end-of-file character on our computer, "coffee", and is running a Unix/Linux/Mac OSX operating system. The **^D** you see in the example above is how the operating system echoes the input. On windows boxes, the end-of-file is **control-Z**.

191.3 Running Python from a file - "Hello Python World"

You won't want to type your instructions (program) in every time, so you can edit your commands into a plain ASCII text file and run the program from that file:

```
coffee% python hello.py
Hello Python World
528.6
coffee%
```

There's no need for the file to have a name ending in **.py** if you're going to run it in this way, but it's a convention and it makes it easier later on when you don't want to have to type "python" in front every time.

Use any ASCII text editor you like, from Ultraedit to Notepad on a Windows operating system, vi or emacs under Unix or Linux, or on textedit under OSX. The important thing to remember is that you must save it as plain ASCII text!

Our file hello.py contained:

```
print "Hello Python World"
base = 30
height = 17.62
area = base * height
print area
```

191.4 Obtaining and installing Python

You may be lucky. If you're running an operating system such as Linux, Python will come as part of the distribution and may already be installed and ready to go. If you're using Python on your web site, hopefully you'll have chosen an ISP that supports the language; in which case it will be already installed.

If Python isn't on your system, a copy on a CD might in the back of Python books. But the best method, because it will always be the most current version available, would be to download a copy from the web.

Downloading from www.python.org

The "Official" version of Python may be found at www.python.org and it's an easy download

Figure 946   Here's the site's front page; it's dynamic, so you'll find that by the time you're reading these notes version numbers and news will have moved on.

Figure 947   The download button takes you to the release page, where you choose which release you want, which takes you to the download page itself where you select the version most appropriate for your operating system.

Once you've downloaded Python, installation instructions will vary depending on your operating system. In most cases, installing Python is no different to installing other downloaded software.

Downloading from ActiveState

An alternative download of Python, which includes commonly used external modules such as Expat for XML handling and (in the Windows version) some Windows extensions. See *http://www.activestate.com*.

Figure 948   An alternative download of Python

Downloading from Plone

If you're going to be using Python as a component part of an application or system, you'll probably wish to download it as part of that application. For example, if you're going to be using the Plone Content Management System, which is built on the Zope application server, which in turn uses Python, you can simply download everything from the Plone site - *http://plone.org.*

Figure 949   Downloading from Plone

Once you've installed your complete system, it should use Python without further setup; if you want to use Python directly, sure, go ahead:

```
C:\Program Files\Plone 2\Python>python
Python 2.3.3 (#51, Dec 18 2003, 20:22:39) [MSC v.1200 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> stock = 20
>>> price = 17.6
>>> value = stock * price
>>> print value
352.0
>>> ^Z


C:\Program Files\Plone 2\Python>
```

You can also associate the Python program with files with a .pl extension so that you can make direct use of the language, for example:

```
C:\DOCUME~1\trainee>type fred.py
print "hello world"


C:\DOCUME~1\trainee>fred.py
hello world

C:\DOCUME~1\trainee>
```

191.5   Python versions

The current (April 2004) version of Python is version 2.3.3. If you're already running a version 2.3, there's no need to upgrade. If you're running version 2.2, we suggest that you don't upgrade unless you have some very specific reason to do so. If it ain't bust, don't fix it!

Version 2.2 introduced a new object model that will be useful in many larger and more complex systems. If you're writing such a system under Python 2.1 or older, you should consider upgrading. Do remember that if you use the new object model in your code, that code will then *only* run on systems running version 2.2 or later, which might be a consideration if you're going to put your live system (or a copy of it) onto a computer for which you are not the administrator, and which may be running an old version

Currently downloadable versions on www.python.org
- Python 2.3.3 (December 19, 2003)
- Python 2.2.3 (May 30, 2003)
- Python 2.1.3 (April 8, 2002)
- Python 2.0.1 (June 2001)
- Python 1.6.1 (September 2000)
- Python 1.5.2 (April 1999)

191.6 What is Python good for?

There are a lot of languages out there, so why choose Python against Java or PHP or Perl or C or...?
- Python is a superb object oriented language that makes it ideal for large projects where coding is going to be shared between a number of people, and typically you'll be talking about a suite of applications rather than a single program.
- Arguably, Object Oriented programming is harder to learn but more efficient to write, alter and maintain in the longer run for larger projects. Typically, the staff involved in writing your Python programs will be computer professionals rather than people who spend only a few percent of their time programming.
- There is no complex compile and load cycle with Python, so it's ideal for scientific experimental work (and prototyping) where the code will be changed frequently. And if you produce a superb prototype, you'll often find that there is no need to then rewrite your application into C / C++ / C# / Java / some other language – the prototype will become the production code!

191.7 Where did the Python name come from?

"And now for ....."

191.8 Other resources

Python is a great embedding language – we've already seen reference to Zope and Plone, and there are many more!

The Vaults of Parnassus *http://www.vex.net/parnassus/* is your starting point:

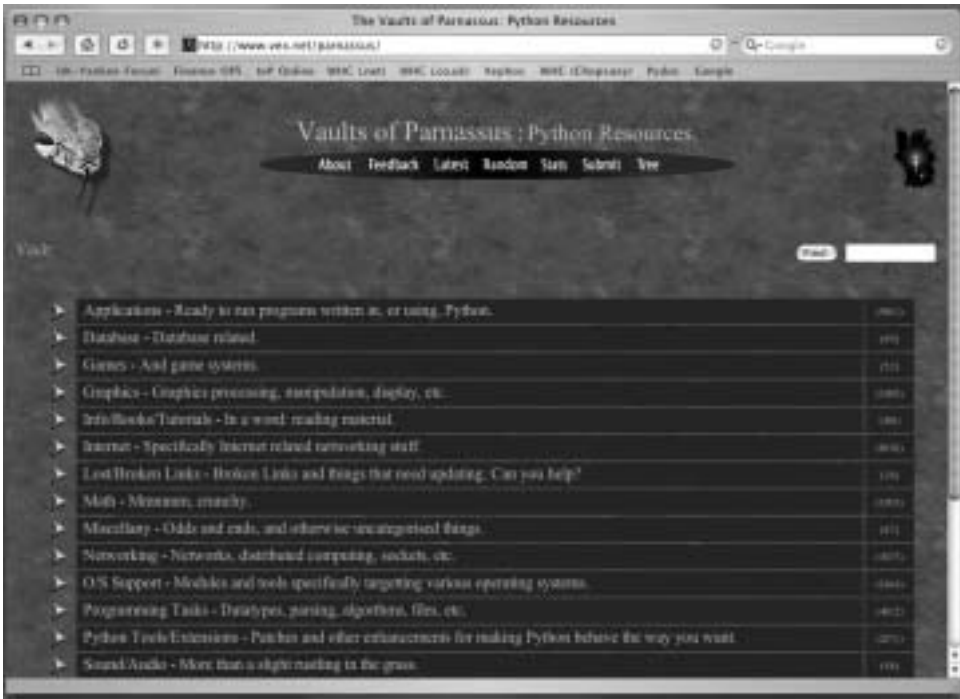**Figure 950   The Vaults of Parnassus**

Here are some of the most recently updated offerings: