Python Programming Training

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Agenda

- What is Python…?
- Differences between program and scripting language
- History of Python
- Scope of Python
- Why do people use Python
- Who uses Python today
- A Sample Code
- Python code execution
- Running Python

What is Python

- Python is a general-purpose programming language that is often applied in scripting roles.
- So, Python is programming language as well as scripting language.
- Python is also called as Interpreted language

Difference between Python and Other Programming languages

Programming language

1. Program a program is executed (i.e., the source is first compiled, and the result of that compilation is expected)
2. A "program" in general, is a sequence of instructions written so that a computer can perform certain task.

Scripting language

1. a script is interpreted
2. A "script" is code written in a scripting language. A scripting language is nothing but a type of programming language in which we can write code to control another software application.

History

- Invented in the Netherlands, early 90s by Guido van Rossum
- Python was conceived in the late 1980s and its implementation was started in December 1989
- Guido Van Rossum is fan of “Monty Python's Flying Circus', this is a famous TV show in Netherlands
- Named after Monty Python
- Open sourced from the beginning

Python's Benevolent Dictator For Life

- "Python is an experiment in how much freedom programmers need. Too much freedom and nobody can read another's code; too little and expressive-ness is endangered.” - Guido van Rossum Goog

Why was python created?

- "My original motivation for creating Python was the perceived need for a higher-level language in the Amoeba [Operating Systems) project. I realized that the development of system administration utilities in C was taking too long. Moreover, doing these things in the Bourne shell wouldn't work for a variety of reasons. ... So, there was a need for a language that would bridge the gap between C and the shell” - Guido Van Rossum

Scope of Python

- Science - Bioinformatics
- System Administration
    - Unix
    - Web logic
    - Web sphere
- Web Application Development
    - CGI
    - Jython - Servlets
- Testing scripts
- Machine Learning and Artifial Intelligence

Why do people use Python...?

The following primary factors cited by Python users seem to be these:

- Python is object-oriented

  Structure supports such concepts as polymorphism, operation overloading, and multiple inheritance.

- Indentation

  Indentation is one of the greatest future in Python.

- It's free (open source)

  Downloading and installing Python is free and easy Source code is easily accessible

- It's powerful

  Dynamic typing

  Built-in types and tools

  Library utilities

  Third party utilities (e.g. Numeric, NumPy, SciPy)

  Automatic memory management

- Python runs virtually every major platform used today.
- As long as you have a compatible Python interpreter installed, Python programs will run in exactly the same manner, irrespective of platform.
- It portable.

Why do people use Python…?

- It's mixable
  - Python can be linked to components written in other languages easily
  - Linking to fast, compiled code is useful to computationally intensive problems
  - Python/C integration is quite common
- It's easy to use
  - No intermediate compile and link steps as in C/ C++
  - Python programs are compiled automatically to an intermediate form called bytecode, which the interpreter then reads
  - This gives Python the development speed of an interpreter without the performance loss inherent in purely interpreted languages
- It's easy to learn, Structure and syntax are pretty intuitive and easy to grasp

Installing Python

- Python is pre-installed on most Unix systems, including Linux and MAC OS X
- But for in Windows Operating Systems , user can download from the https://www.python.org/downloads/

Who uses python today...

- Python is being applied in real revenue-generating products by real companies. For instance:
- Google makes extensive use of Python in its web search system, and employs Python's creator.
- Intel, Cisco, Hewlett-Packard, Seagate, Qualcomm, and IBM use Python for hardware testing.
- ESRI uses Python as an end-user customization tool for its popular GIS mapping products.
- The YouTube video sharing service is largely written in Python

What can I do with Python … ?

- System programming
- Graphical User Interface Programming
- Internet Scripting
- Component Integration
- Database Programming
- Gaming, Images, XML , Robot and more

A Sample Code

A Sample Code

```
x = 34 - 23          # A comment.
y = "Hello"          # Another one.
z = 3.45
if z == 3.45 or y == "Hello":
    x = x + 1
    y = y + " World"  # String concat.
print x
print y
```

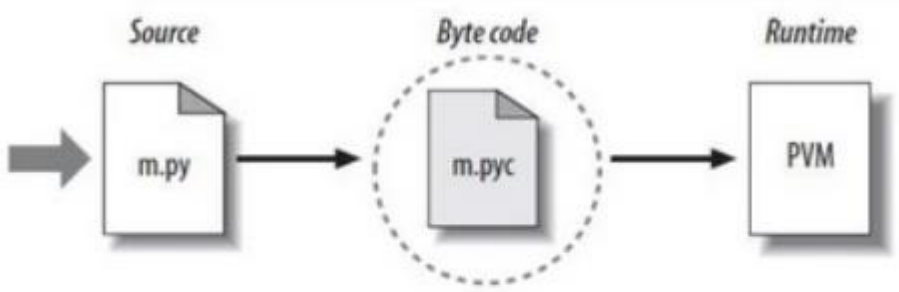
Enough to understand the code

- Indentation matters to code meaning

  Block structure indicated by indentation
- First assignment to a variable creates it
- Variable types don't need to be declared.
- Python figures out the variable types on its own.
- Assignment is = and comparison is ==
- For numbers + - */% are as expected
- Special use of + for string concatenation and % for string formatting (as in C's printf)
- Logical operators are words (and, or, not) not symbols
- The basic printing command is print

Python Code Execution

- Python's traditional runtime execution model: source code you type is translated to byte code, which is then run by the Python Virtual Machine. Your code is automatically compiled, but then it is interpreted.



Source code extension is **.py**
Byte code extension is **.pyc** (compiled python code)

Running Python

Once you're inside the Python interpreter, type in commands at will.

- Examples:

```
>>> print 'Hello world'
Hello world
# Relevant output is displayed on subsequent lines without the >>> symbol
>>> x = [0,1,2]
# Quantities stored in memory are not displayed by default
>>> x
# If a quantity is stored in memory, typing its name will display it
[0,1,2]
>>> 2+3
5
```