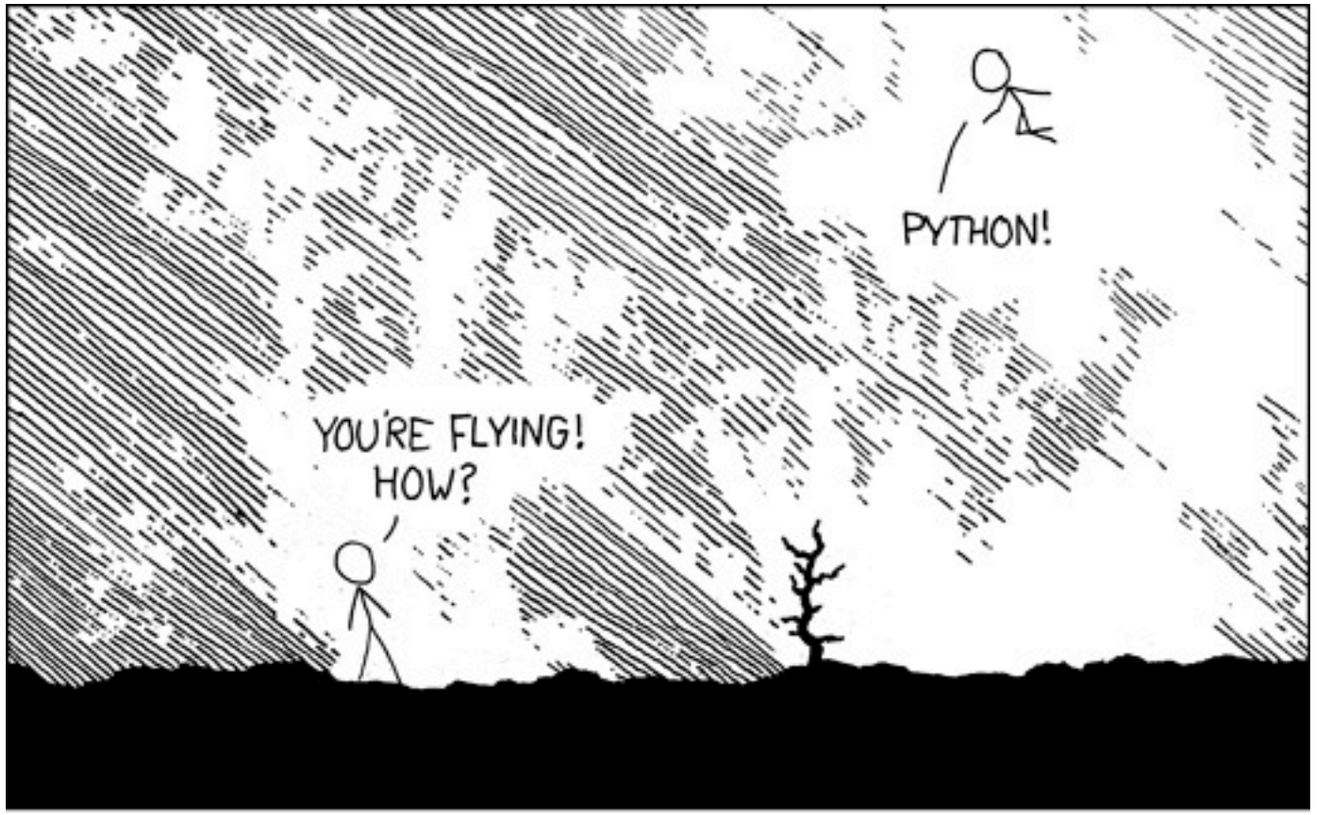


Python!

Basic types and operations

Lecture 6 - COMP 364
January 26, 2010, updated 2012
Derek Ruths

Next Lecture

- Trottier 3070 (3rd floor)
- Come a little early if you don’t have an account on the Computer Science computers
- We will experiment with some Python features

What is Python?

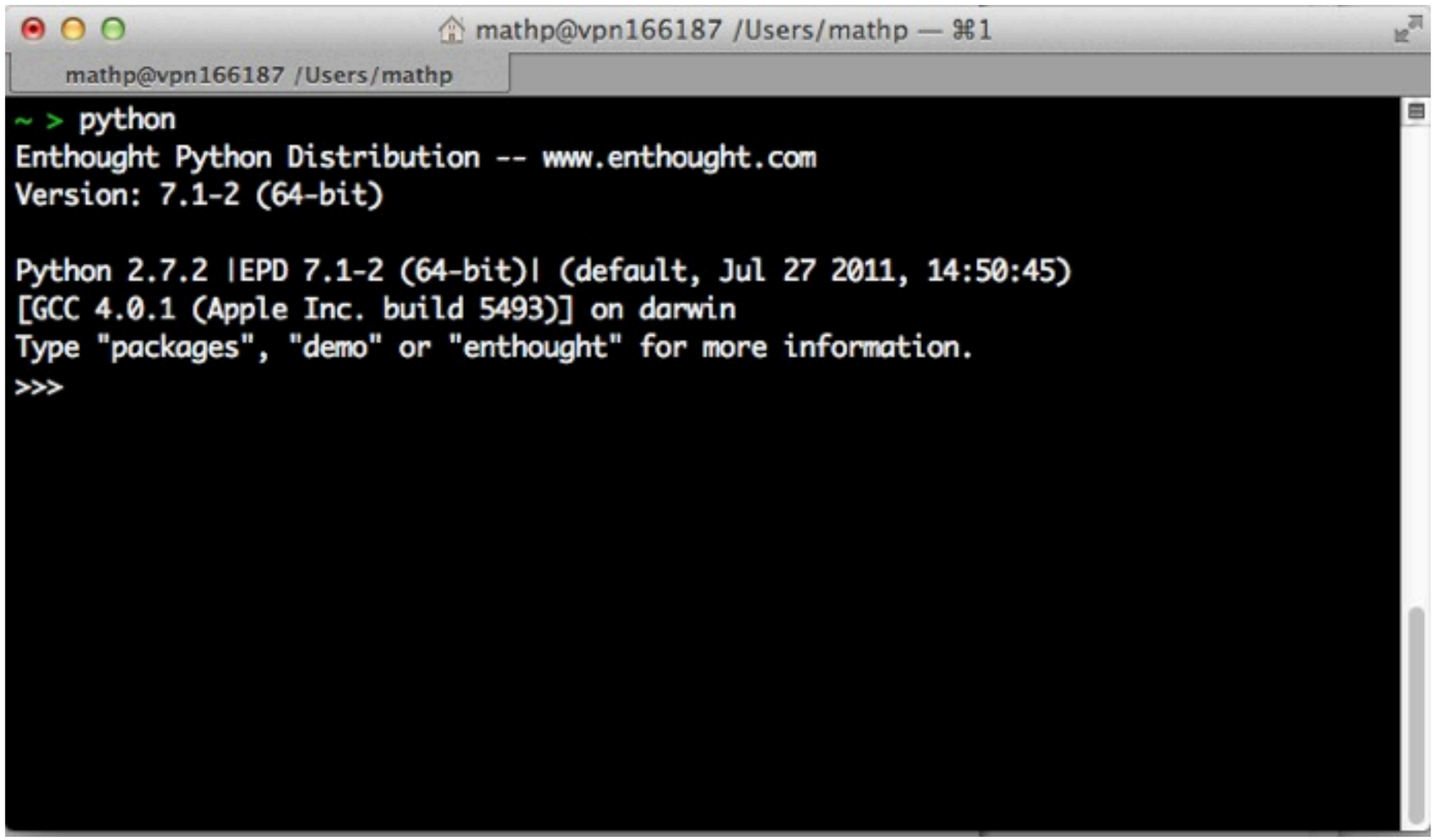
- Python: a scripting language
    - Perform more advanced operations on data
- Python: a programming language
    - Develop sophisticated applications that provide a user-friendly way of performing complex tasks on the computer
- Python: simply awesome

Installing Python on your machine

- The Enthought distribution contains all packages that we will need.
    - http://download.enthought.com/epd_7.2/
- Mac epd-7.2-2-macosx-i386.dmg
- Linux (Ubuntu) epd-7.2-2-rh5-x86.sh
- Windows epd-7.2-2-win-x86.msi
- Install it on your machine now!

Starting the python console

- Run “python” on UNIX (or /usr/bin/python).
    - On Windows, run the Python Command Line in the start menu



Our first python “program”

```
>>> print “Hello world”
```

A python command that prints whatever comes after it

A string

Some types of objects in python

- String: always in single or double quotes
  - *“Hello world”*
  - *‘Hello world’*
- Integer: a number (no decimal)
  - *3*
- Float: a number with a decimal place
  - *3.2*
- Boolean: True or False
  - *True*
  - *False*

All of these are printable!

Operators

- +
  - Numbers (integer & float): add
  - String: concatenate (“Hello “ + “World” = “Hello World”)
- -
  - Numbers: subtract
- *
  - Numbers: multiply
- /
  - Numbers: divide

Arithmetic expressions

- General rules:
  - If same types are involved, stick with that type
  - If different types are involved, move to the more “accurate” type
- Int + Float = Float
  - 2 + 2.3 = 4.3
- Int / Float = Float
  - 5 / 1.5 = 3.33333....
- Int / Int = Int
  - 5 / 2 = 2
  - Python will round the result to the nearest integer!

All of these are printable too!

The Syntax Error

```
>>> primt “Hello world”
>>> + 4 “Hello”
```

A syntax error: a problem with your code in which you didn’t follow the rules of the language.

- Which of the following contain syntax errors?
  - The eat tree sixteen quickly. (in English)
  - “Hello” - 2.3 (in python)
  - “Hello’ + ‘hi (in python)
  - encho “Hello world” (in the shell)
  - The tree parked the car. (in English)

Variables

- Variables are placeholders for values they contain
  - $1 was a variable in batch scripts
- In python, a variable can contain pretty much *anything*
- *Assignment* is when you give a variable the value it will contain
  - *x = “hello”*
  - *x = 2*
  - *x = 10.3*
- After being assigned a value, a variable can be used anywhere its value could be used:
  - *x = “hello”*
  - *print x*
  - *print x + “ world”*

Assignments, and what is evaluated first

- When writing an assignment expression (e.g. x = x + 3), the right side is always evaluated first, then the assignment is made.

```
>>> x = “Hello ”      # Assign “Hello “ to x
>>> y = x
>>> x = x + “World”  # “World” is added to x (“Hello “), then new value (“Hello World”) is assigned to x
>>> print x
Hello World
>>> print y
```

- What does the last command print?

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>>> print x
Hello World
>>> print y
```

- What does the last command print?

```
>>> print y
Hello
```

Our first python program

In a normal text file:

```
print “Hello world”
```

A python command that prints whatever comes after it

A string

Then run it with by typing `python <filename>`

Comments

- Anything after “#” on a line will not get evaluated
    - Used for commenting, or describing what is going on
- Using this principle, putting # before a line will not execute it.