



Week 1

basic Python programs,
defining functions

Special thanks to Scott Shawcroft, Ryan Tucker, and Paul Beck for their work on these slides.

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About Us

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Python!

- Created in 1991 by Guido van Rossum (now at Google)
 - Named for Monty Python
- Useful as a **scripting language**
 - **script**: A small program meant for one-time use
 - Targeted towards small to medium sized projects
- Used by:
 - Google, Yahoo!, Youtube
 - Many Linux distributions
 - Games and apps (e.g. Eve Online)



Installing Python

Windows:

- Download Python from <http://www.python.org>
- Install Python.
- Run **Idle** from the Start Menu.

Mac OS X:

- Python is already installed.
- Open a terminal and run `python` or run Idle from Finder.

Linux:

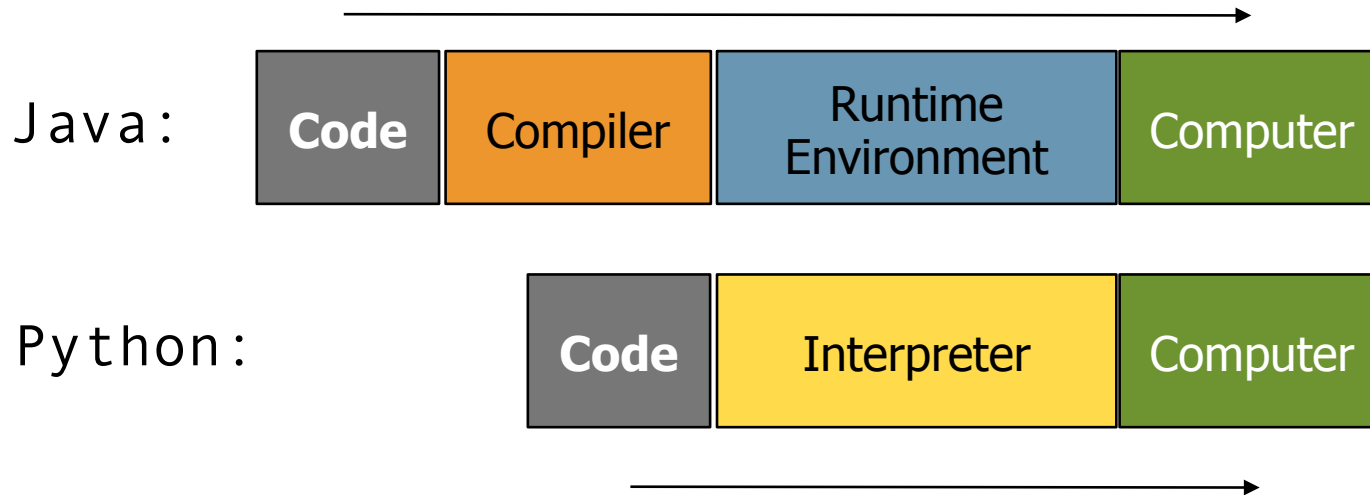
- Chances are you already have Python installed. To check, run `python` from the terminal.
- If not, install from your distribution's package system.

Note: For step by step installation instructions, see the course web site.



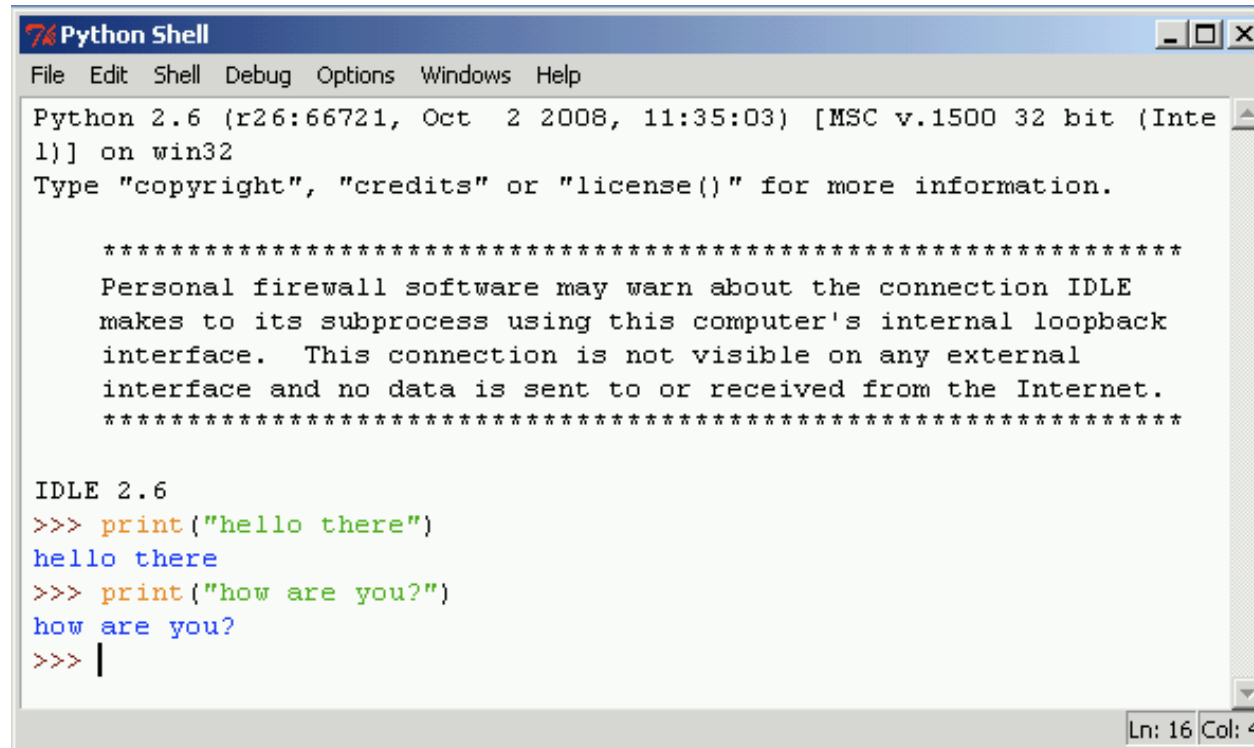
Interpreted Languages

- **interpreted**
 - Not compiled like Java
 - Code is written and then directly executed by an **interpreter**
 - Type commands into interpreter and see immediate results



The Python Interpreter

- Allows you to type commands one-at-a-time and see results
- A great way to explore Python's syntax
 - Repeat previous command: Alt+P



```
Python Shell
File Edit Shell Debug Options Windows Help
Python 2.6 (r26:66721, Oct 2 2008, 11:35:03) [MSC v.1500 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.

*****
Personal firewall software may warn about the connection IDLE
makes to its subprocess using this computer's internal loopback
interface.  This connection is not visible on any external
interface and no data is sent to or received from the Internet.
*****

IDLE 2.6
>>> print("hello there")
hello there
>>> print("how are you?")
how are you?
>>> |
Ln: 16 Col: 4
```

Chapter 1 Review

- **Console output:** `System.out.println`
- **Methods:** `public static void name() { ...`

Hello2.java

```
1 public class Hello2 {
2     public static void main(String[] args) {
3         hello();
4     }
5
6     public static void hello() {
7         System.out.println("Hello, world!");
8     }
9 }
```

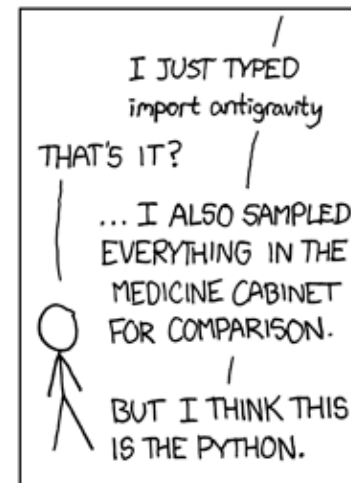
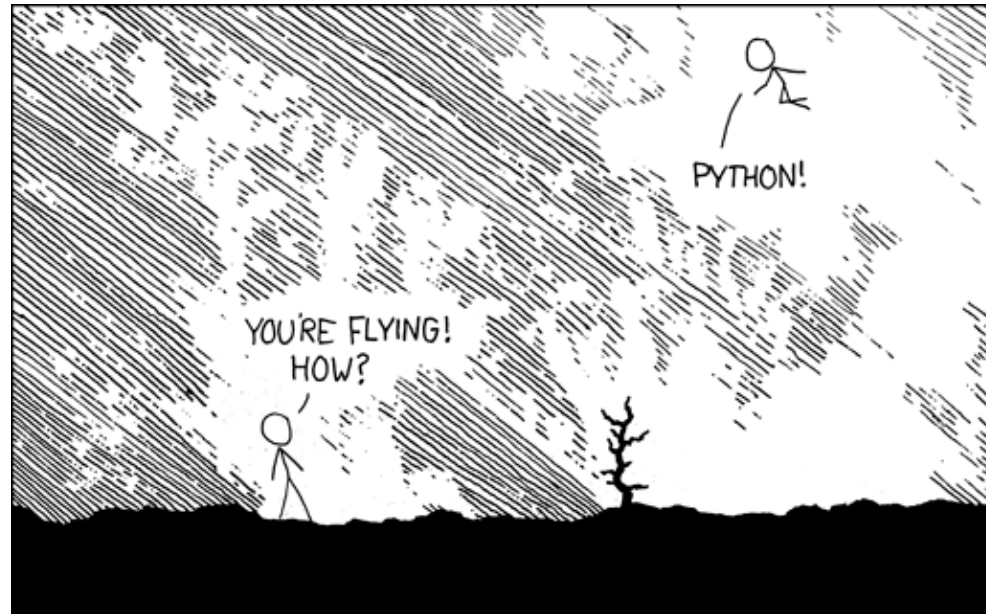
Our First Python Program

- Python does not have a `main` method like Java
 - The program's main code is just written directly in the file
- Python statements do not end with semicolons

hello.py

```
1 print("Hello, world!")
```


A Brief Review



The `print` Statement

```
print("text")  
print()           (a blank line)
```

- Escape sequences such as `\` are the same as in Java
- Strings can also start/end with `'`

swallows.py

```
1 print("Hello, world!")  
2 print()  
3 print("Suppose two swallows \"carry\" it together.")  
4 print('African or "European" swallows?')
```

Comments

- Syntax:
 # **comment text (one line)**

swallows2.py

```
1 # Suzy Student, CSE 142, Fall 2097
2 # This program prints important messages.
3 print("Hello, world!")
4 print()                # blank line
5 print("Suppose two swallows \"carry\" it together.")
6 print('African or "European" swallows?')
```

Functions

- **Function:** Equivalent to a static method in Java.
- **Syntax:**

```
def name () :  
    statement  
    statement  
    ...  
    statement
```

hello2.py

```
1  # Prints a helpful message.  
2  def hello():  
3      print("Hello, world!")  
4  
5  # main (calls hello twice)  
6  hello()  
7  hello()
```

- Must be declared above the 'main' code
- Statements inside the function must be indented

Whitespace Significance

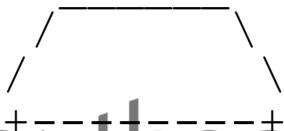
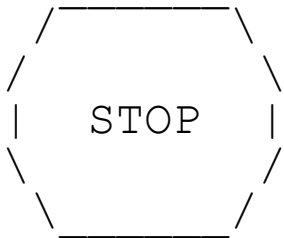
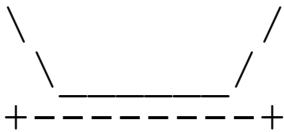
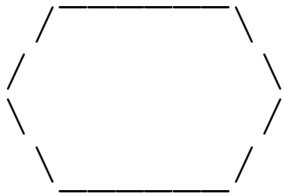
- Python uses indentation to indicate blocks, instead of { }
 - Makes the code simpler and more readable
 - In Java, indenting is optional. In Python, you **must** indent.

hello3.py

```
1 # Prints a helpful message.
2 def hello():
3     print("Hello, world!")
4     print("How are you?")
5
6 # main (calls hello twice)
7 hello()
8 hello()
```

Exercise

- Rewrite the Figures lecture program in Python. Its output:



Exercise Solution

```
def egg():
    top()
    bottom()
    print
```

```
def cup():
    bottom()
    line()
    print
```

```
def stop():
    top()
    print("|   STOP   |")
    bottom()
    print
```

```
def hat():
    top()
    line()
    print
```

```
def top():
    print("      ")
    print(" /_____\\")
    print("/           \\")
```

```
def bottom():
    print("\\           /")
    print("\\_____/" )
```

```
def line():
    print("+-----+")
```

```
# main
egg()
cup()
stop()
hat()
```

