

CS 161: Introduction to Programming and Problem-solving

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Programming Tools & Practices

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Python

- Easy to use programming language
- What makes Python so easy to use compared to many other programming languages?
 - interpreted vs. compiled
 - dynamic vs. static typing
 - runs equally well on most computer systems (linux, windows, mac, etc.)

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Installing Python On Windows

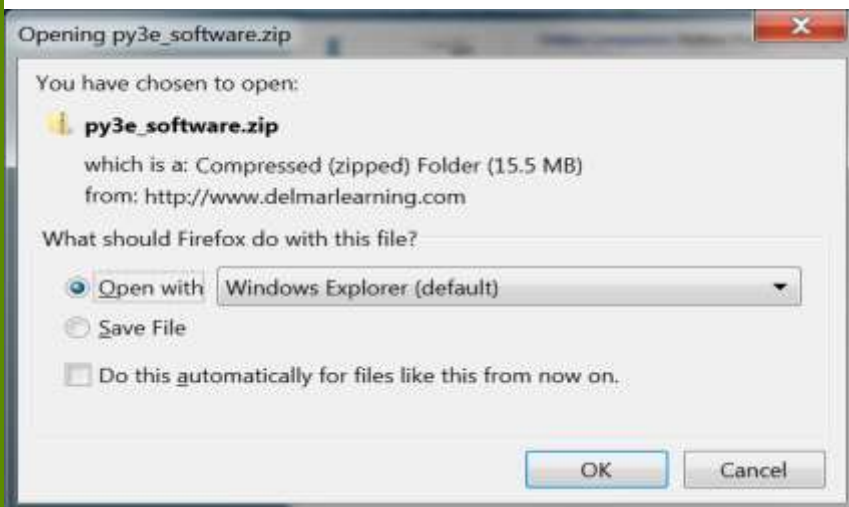
- Visit the textbook resource site:
 - <http://tinyurl.com/63ushvt>
- Click on the “Book related software” link



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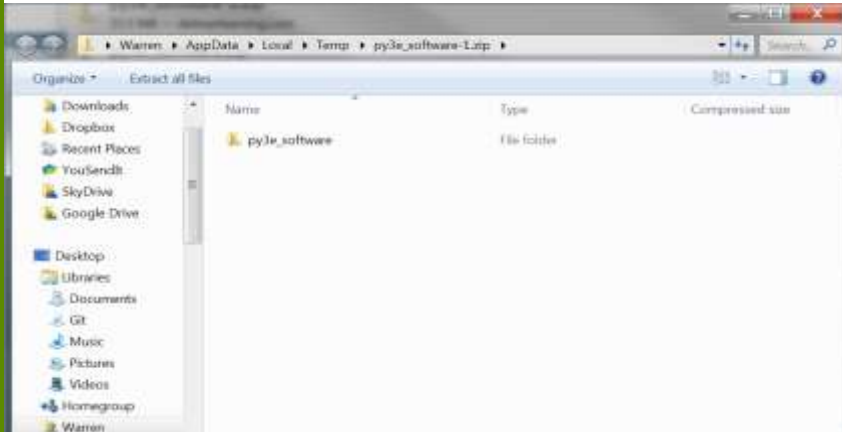
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Open the Software Package



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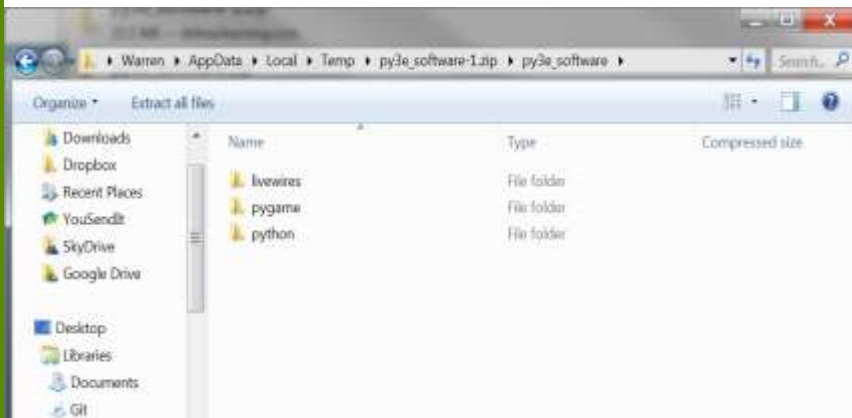
You'll See the Installation Folder



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You'll Find Three Packages You Can Install

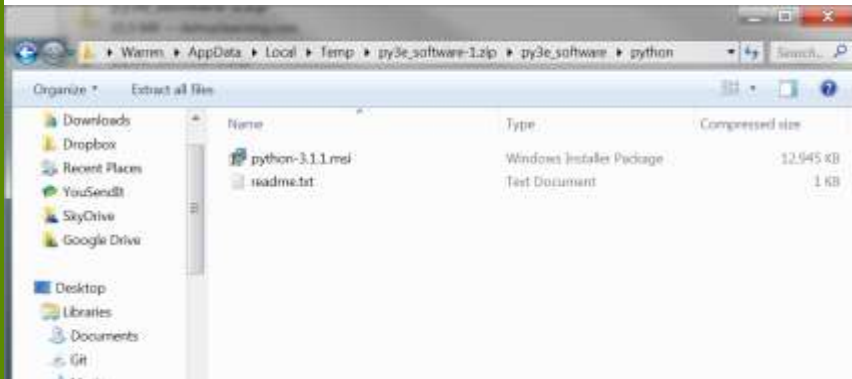


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Install Python

(you don't need to install the others yet)



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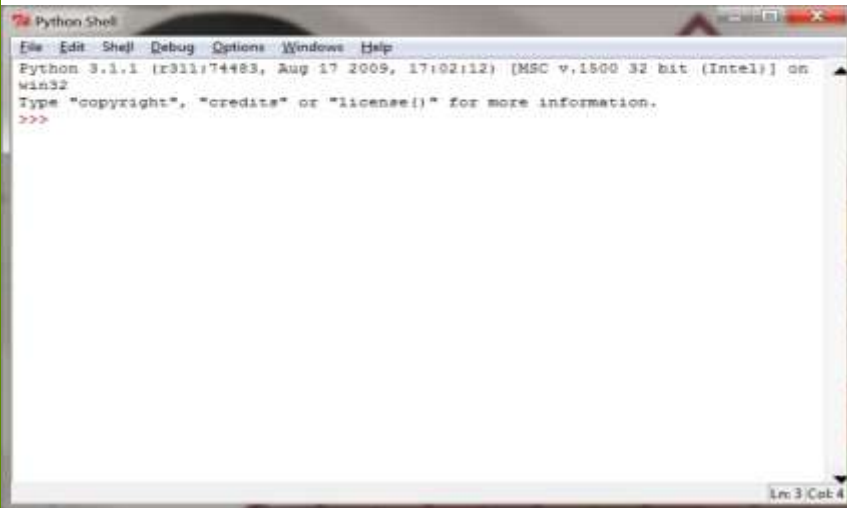
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Work Through the Python Installation Wizard



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Welcome to IDLE, the Python Integrated Development Environment



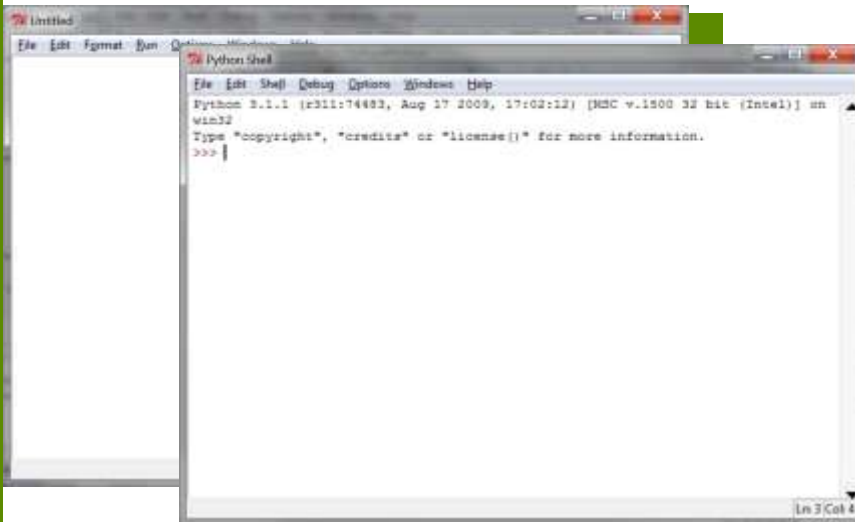
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Options/Configure Idle/General *so the edit window will open automatically*



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Write Programs in the Editor or Run Instructions in the Shell



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What Is an Integrated Development Environment (IDE)?

- Provides a way to enter your program instructions (code editor)
- Convenient way to execute instructions within the environment (interactive mode)
- Convenient way to “debug” the program
- Makes software development much less complex

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Some Other IDEs for Python

- Eric5
- Geany
- ActiveState Komodo
- MonoDevelop
- PyScripter
- Python Tools for Visual Studio
- Spyder
- SPE – Stani’s Python Editor

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The logo for Portland State University, featuring the text "PORTLAND STATE UNIVERSITY" in a serif font, with "PORTLAND STATE" on the top line and "UNIVERSITY" on the bottom line, all in white text on a green rectangular background.

Python.org

- Official website for Python
- You can download the most recent version (3.3.0)
- Should you use the 3.1 version from book site? There have been some changes between 3.1 and 3.3, but we probably won't encounter them.
- If you want to play it safe, stick with 3.1

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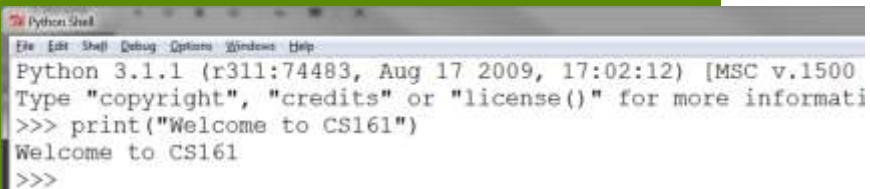
The Python Interactive Mode Runs From the Python Shell

- Try the “print” function
- Used in a Python program to display a message
- Often the message is a *string* of characters surrounded by quote marks
- `print("Welcome to CS161")`

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The Interactive Mode Immediately Executes a Python Instruction



```
Python Shell
File Edit Shell Debug Options Windows Help
Python 3.1.1 (r311:74483, Aug 17 2009, 17:02:12) [MSC v.1500
Type "copyright", "credits" or "license()" for more informati
>>> print("Welcome to CS161")
Welcome to CS161
>>>
```

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The Syntax of the Python `print` Instruction

- Starts with the word “`print`”
- *Case sensitive*: upper/lower case matters
- The thing you want to print is called an *argument* to the print function and is surrounded by parentheses:
 - `print (...)`
- If a text message, surround it with quote marks:
 - `print("Welcome to CS161")`

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Using Script Mode

- Interactive mode doesn't save instructions for later use
- Script mode is used to create programs that can be executed later
- Use the IDLE editor to enter Python instructions

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Enter the Code Select Run/Run Module

The screenshot shows two windows from a Python IDE. The top window, titled 'Untitled1', contains the code `print("Welcome to CS161")`. The bottom window, titled 'Python Shell', shows the output of running the code: `Python 3.1.1 (r311:74483, Aug 17 2009, 17:02:12) [MSC v win32`, `Type "copyright", "credits" or "license()" for more inf`, `>>> ===== RESTART =====`, `>>>`, `Welcome to CS161`, and `>>> |`.

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Comments

- Notes you write yourself within the code
- Use a “#” to begin a comment
- Python ignores everything that follows the “#”
- Helps you remember how the program works if you step away for a few days
- Also helps others that may need to understand how your program works
- You may also use blank lines to improve the readability

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Using Comments to Identify Yourself

- Every program should start with one or more comment lines that identify the author and the program:

```
# Copyright © 2013 Warren Harrison  
# Homework Assignment 1
```

- We expect every piece of code you hand in to follow this standard – we won't mention it explicitly in the assignments



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Using the `input` function to display a prompt

- `Input("Hit <Enter> key to continue")`
- Displays a message and then waits for the user to press the <Enter> key



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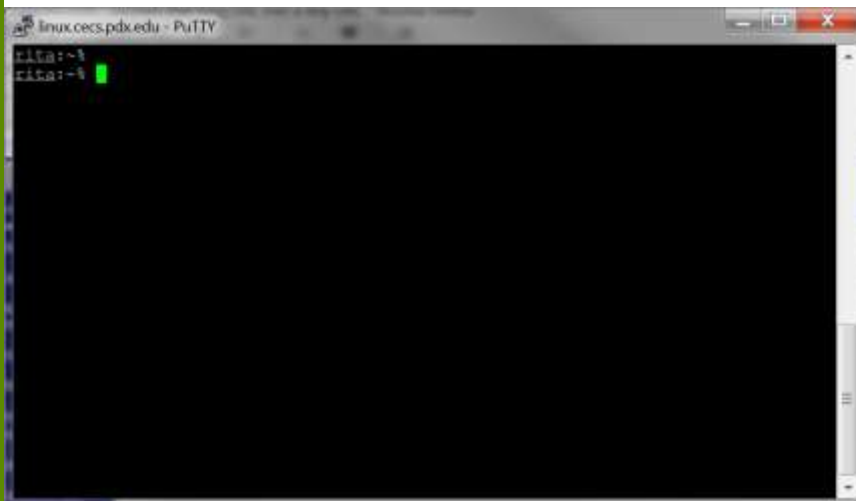
Using Python on the CS Linux System

- Login to the CS Linux System, either in the Lab or remotely through a terminal program like PuTTY (see <http://www.putty.org/>)
- For remote access, install the terminal client PuTTY (putty-0.62-installer.exe) from <http://tinyurl.com/2r4w> and login to linux.cecs.pdx.edu

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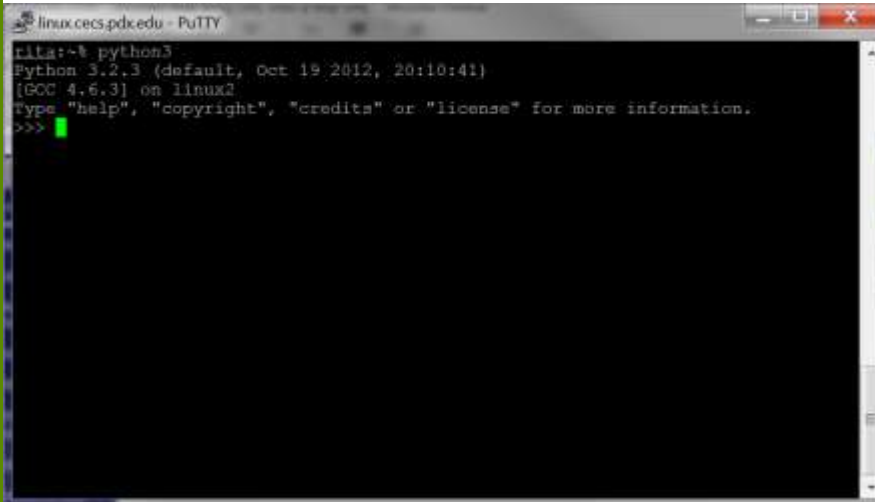
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The Linux Command Line



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The Python Interactive Mode Under Linux




A screenshot of a terminal window titled "linux.cecs.pdx.edu - PuTTY". The terminal shows the command `lita:~$ python3` being executed. The output is: `Python 3.2.3 (default, Oct 19 2012, 20:10:41)
[GCC 4.6.3] on linux2
type "help", "copyright", "credits" or "license" for more information.
>>>` A green cursor is visible on the line `>>>`.

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Creating Python Programs In Linux

- Use a text editor to type in instructions
- **nano** is a popular linux editor
- **nano hello.py**
- Save the program and then run it using `python3`:
- **python3 hello.py**

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linux.cecs.pdx.edu - PuTTY

GNU nano 2.2.6 File: hello.py

```
print("hello world")
```

Read 2 lines

Get Help	WriteOut	Read File	Prev Page	Cut Text	Cur Pos
Exit	Justify	Where Is	Next Page	UnCut Text	To Spell

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Homework1

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What About Macs?

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