Lecture 9:

THE `main()` FUNCTION

CSC111: Introduction to CS through Programming

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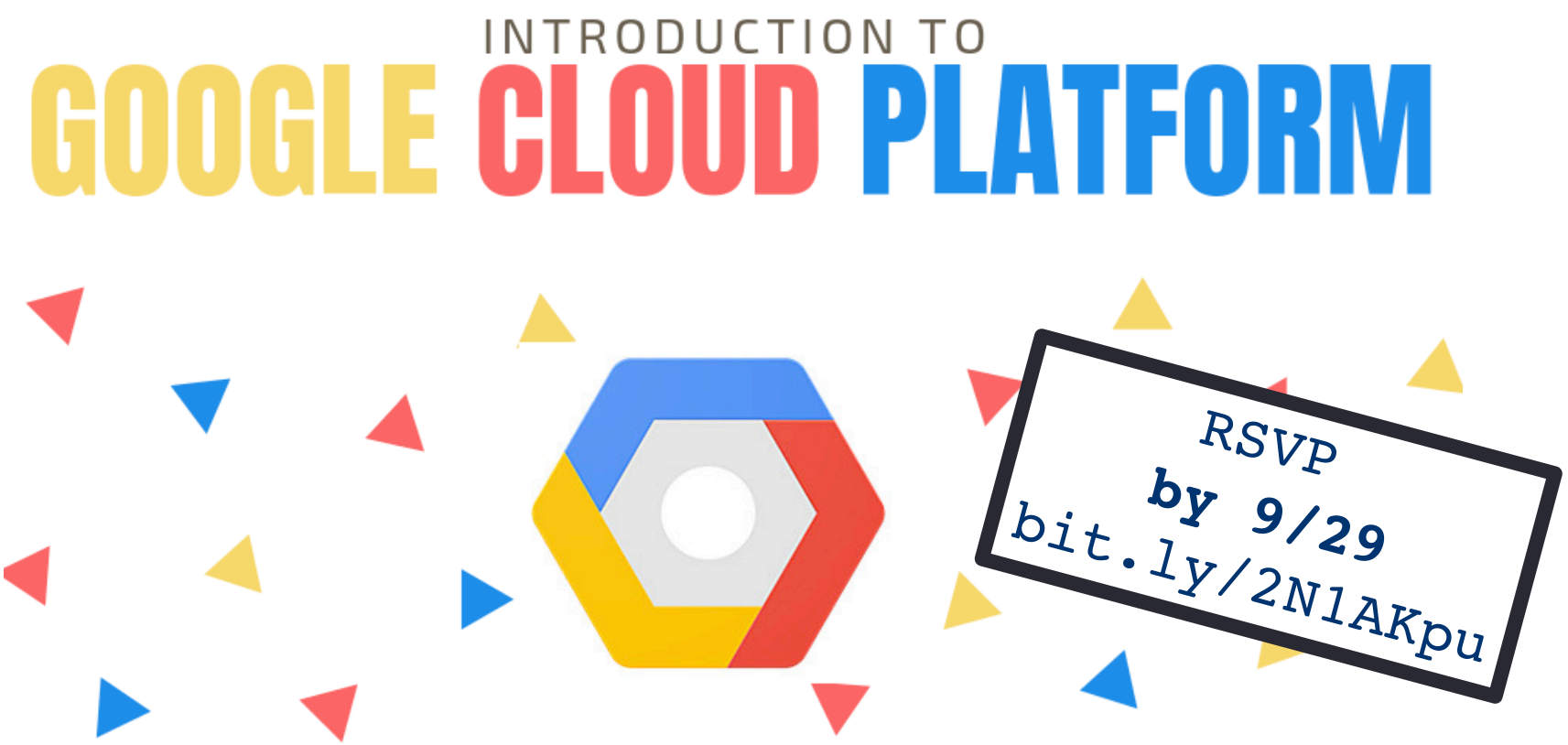
Assistant Professor of Computer Science

Smith College

Announcements



Microsoft
New England Research
& Development Center

RECAP?

Student Day @ the NERD on Monday 9/24

- Tour the facility, visit with Boston-area Smith alums, see cool demos, check out the maker space, win cool prizes!
- Travel support / carpooling available
- Interested? Fill out the form posted to Slack or talk to Asmita (your CS Department Liaison)

About Assignment 2

- 92 / 92 assignments submitted on time (!!!)
- Almost everyone included a header and had appropriate variable names (nice work)
- Most submissions passed all automated tests on **integers**
- Currently working on testing **floats**
- A few notes on **attributing resources:**

A reminder from the syllabus

- **Attribution**:
  - The names of all collaborating students should be listed at the top of the submission. [Note: this includes help from TAs.]
  - If you worked alone, please state: "*I did not collaborate with anyone on this assignment.*"
- "**References**"
  - In-line citations to any resources you used, including page numbers (if a printed resource) or a direct URL (if an online resource).
  - If you did not use any resources in completing the assignment, please state: "*I did not utilize any external resources in completing this assignment.*"
- Approximately 10% of A2 submissions had one ☹

Here's what I want to see

*documentations.py - /Users/jcrouser/Google Drive/Teaching/Course Material/CSC111/CSC111/demos/documentations....

```
#-------------------------------------------------
#       Names: Jordan Crouser & Morganne Crouser
#        Date: 26 September 2018
#    Filename: demo.py
# Description: This is a demonstration of how to
#              propertly attribute help on a
#              CSC111 assignment
#-------------------------------------------------

name = input("Enter your name: ")
formatted_string = "{0:>10}".format(name)
print(formatted_string)

# REFERENCES
# I googled how to use the str.format(...) method
# and found the Python documentation here:
# https://docs.python.org/3/library/stdtypes.html#str.format
```

Ln: 17 Col: 60

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Ln: 15 Col: 12

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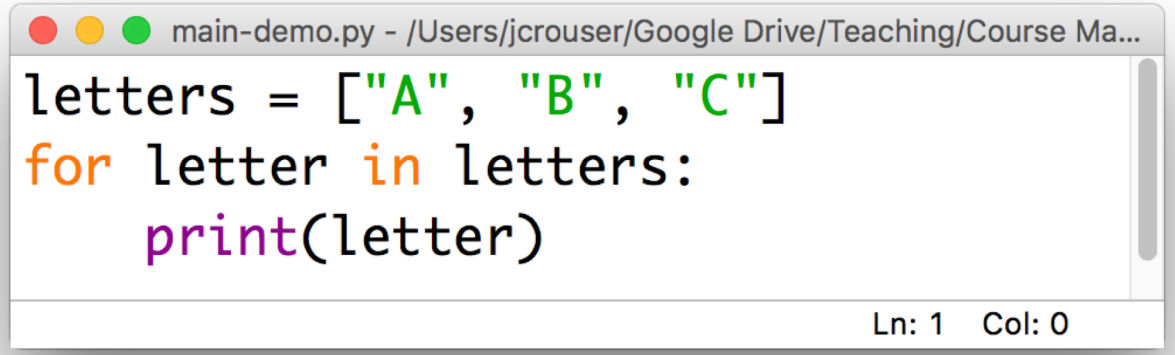
Ln: 15 Col: 12

Overview

- ✓Recap of assignment 2
- ✓Strings
  - ✓operations on strings
  - ✓accessing individual letters
  - ✓handy methods
- The `main()` function
- Lab: Pretty Printing
- Life skill #2: debugging

Recap

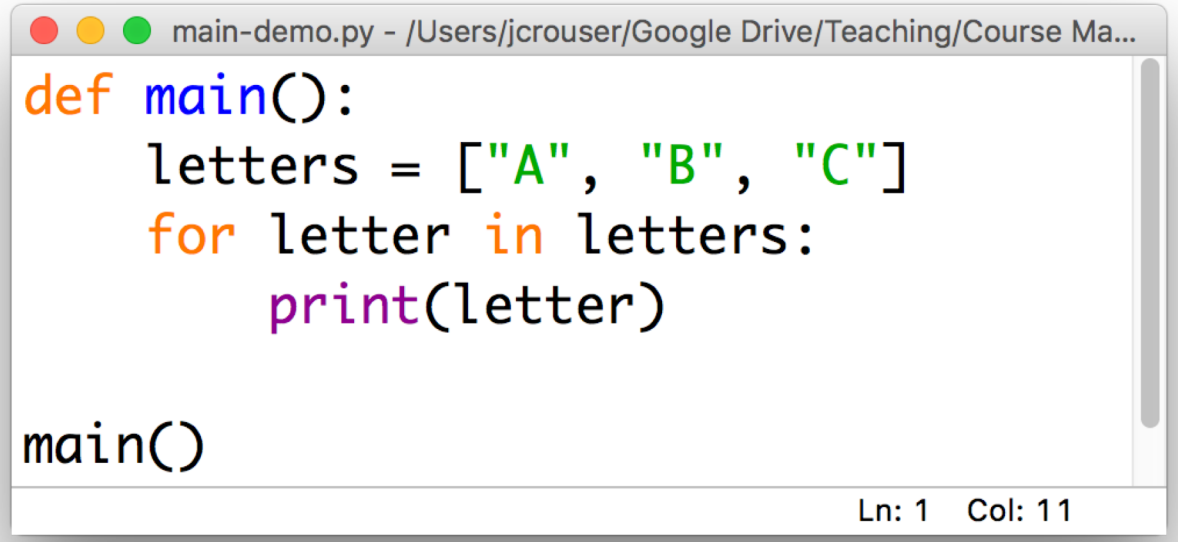
- So far, we've been writing code in files as if we were writing it on the console:



- When we do this, the Python interpreter executes everything from the **top down**

An alternative

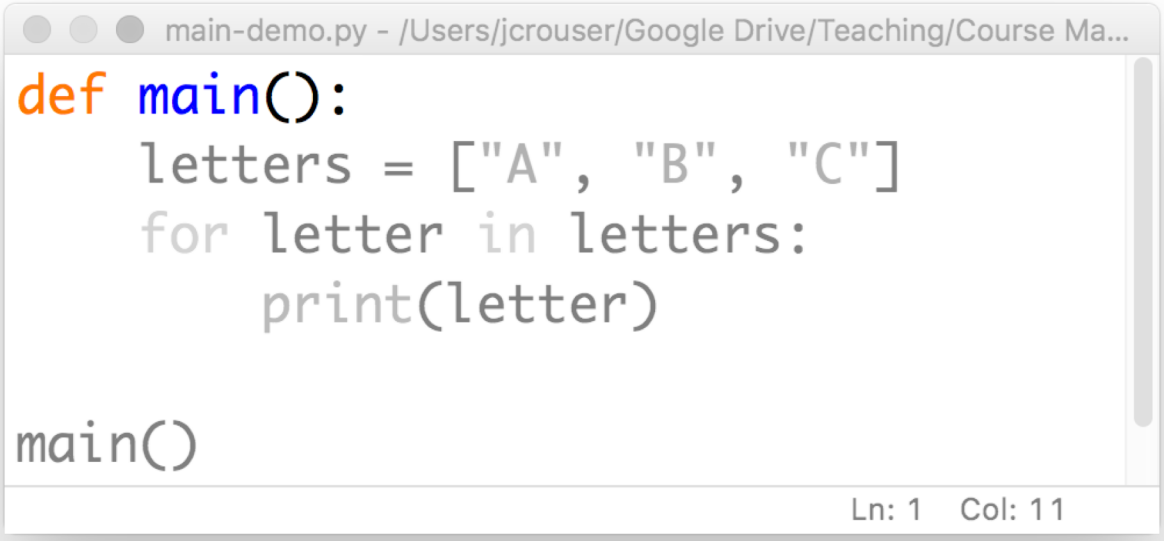
- It is better practice to write the code you want to execute inside a `main()` function, e.g.



- This lets the interpreter ”read ahead” and **then** execute

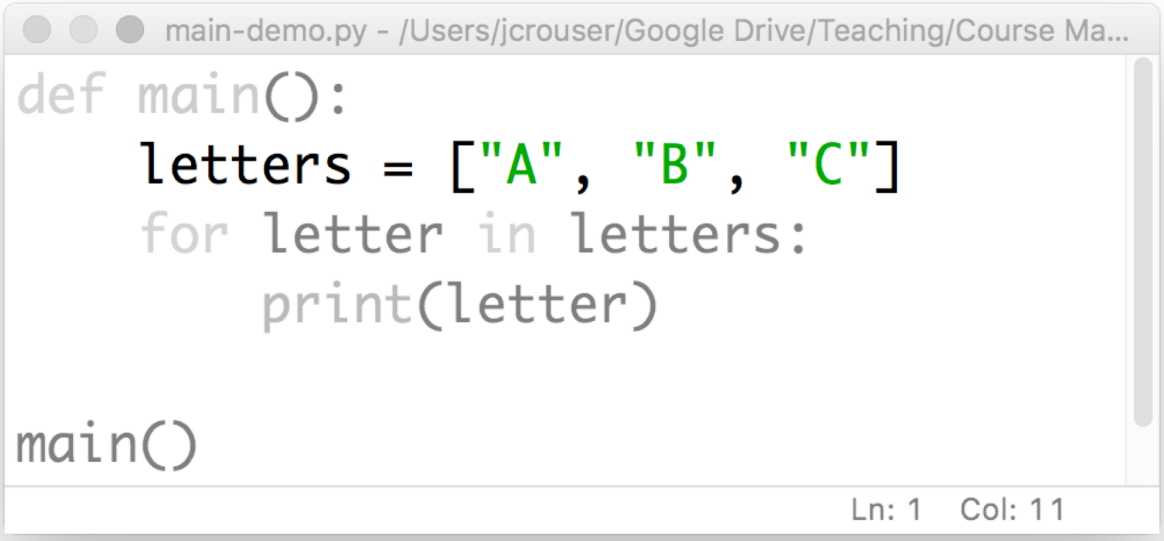
How this works

- **Remember**: the interpreter reads from the top down, which means that it reads the **definition** first



How this works

- Then it reads each line inside the definition, but these don't get **executed** yet



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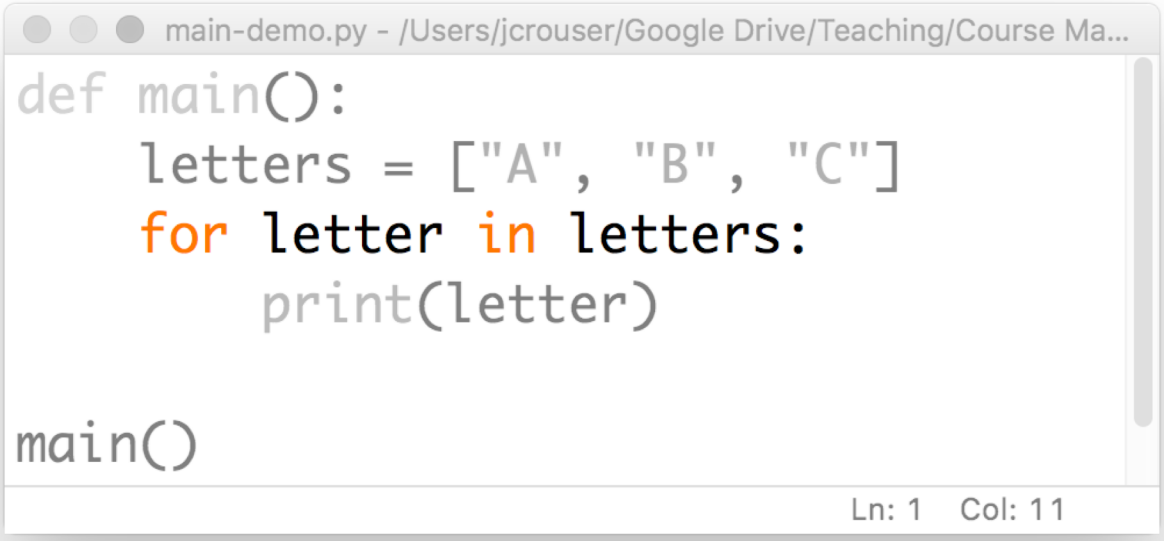

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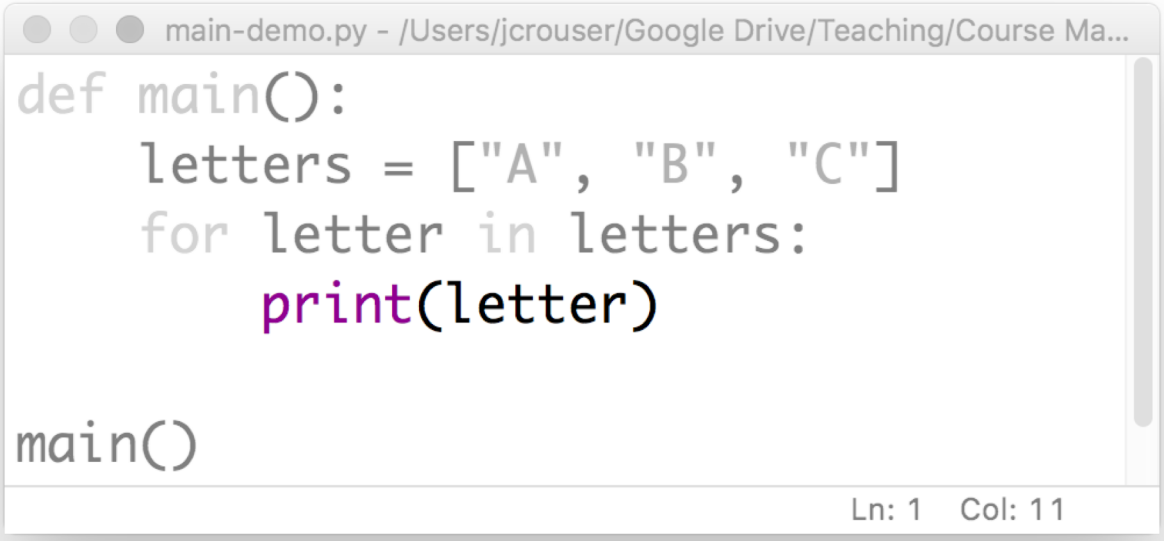
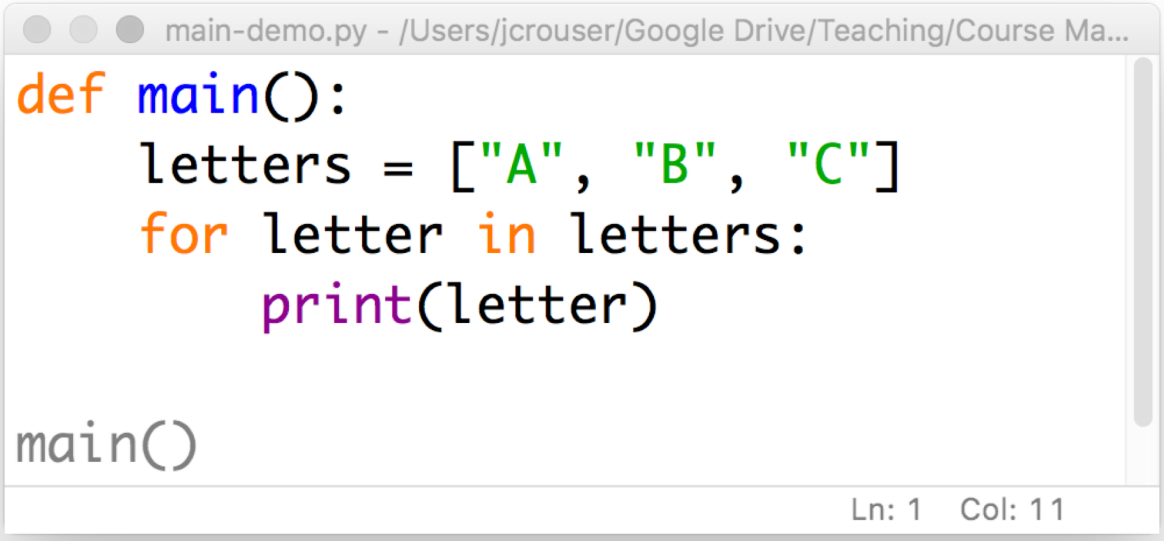


How this works

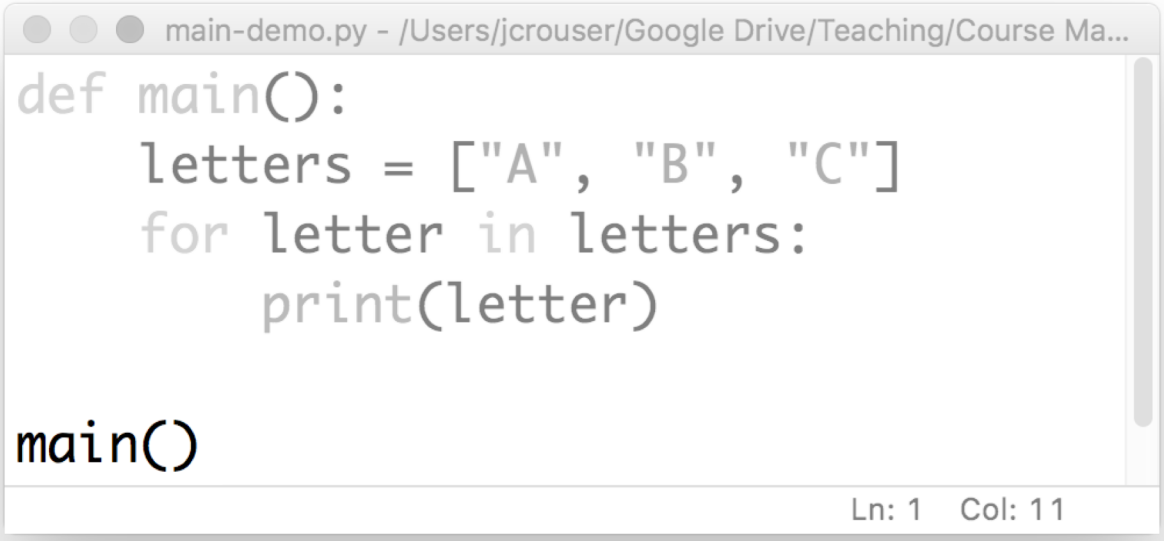
- At this stage, we've given python a "recipe" for what we want it to do when we call **`main()`**



- If we stop here, **nothing will actually happen**

How this works

- The real work happens only when we actually **call** the **`main()`** function



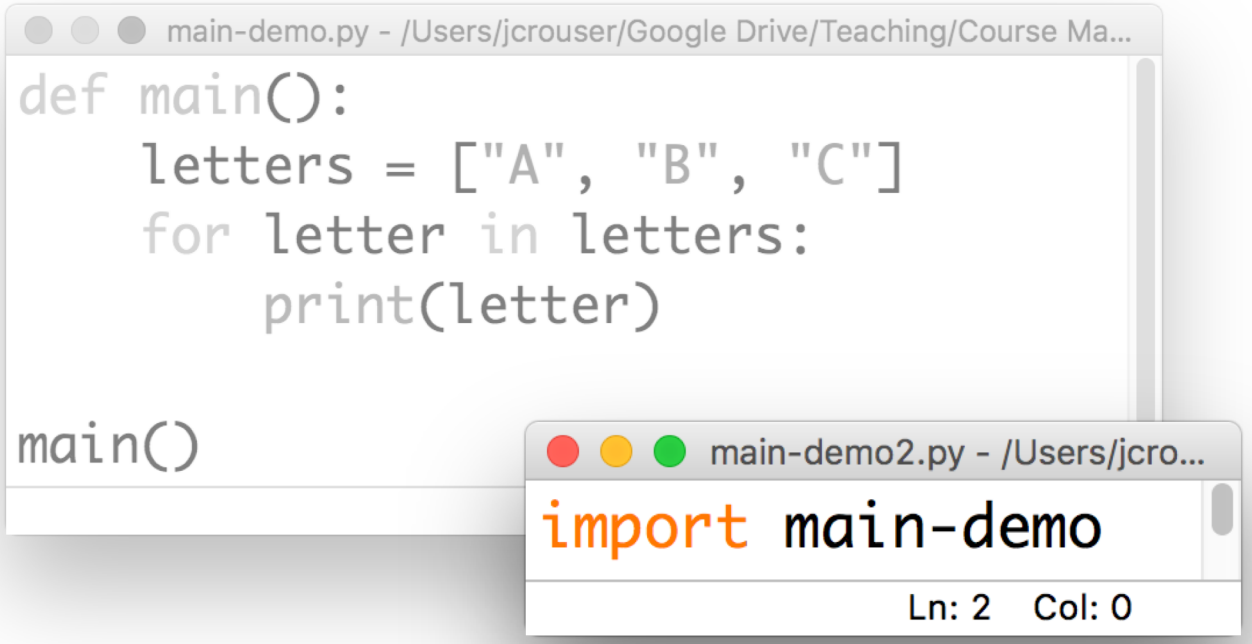
- When we do, python goes to the **`main()`** box and follows the instructions it finds there

Discussion

Why bother?

Just one more thing…

- What happens if someday we want to use the code in this file as **part of another program**?



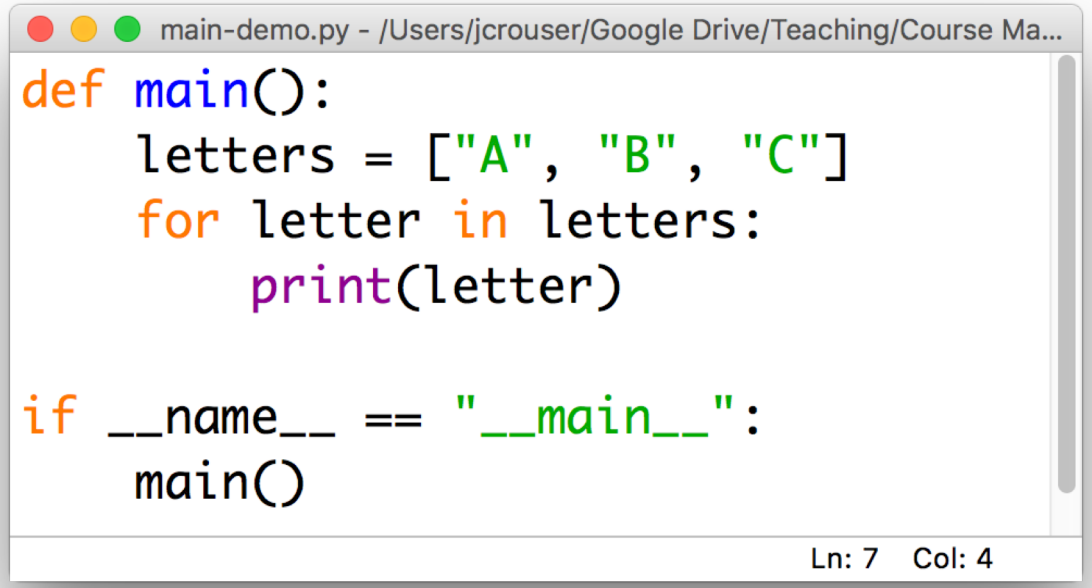
Discussion

- **What we need:** a way to tell python to behave one way when we **run it as a "stand-alone" program**, and a different way when we `import` it

Ideas?

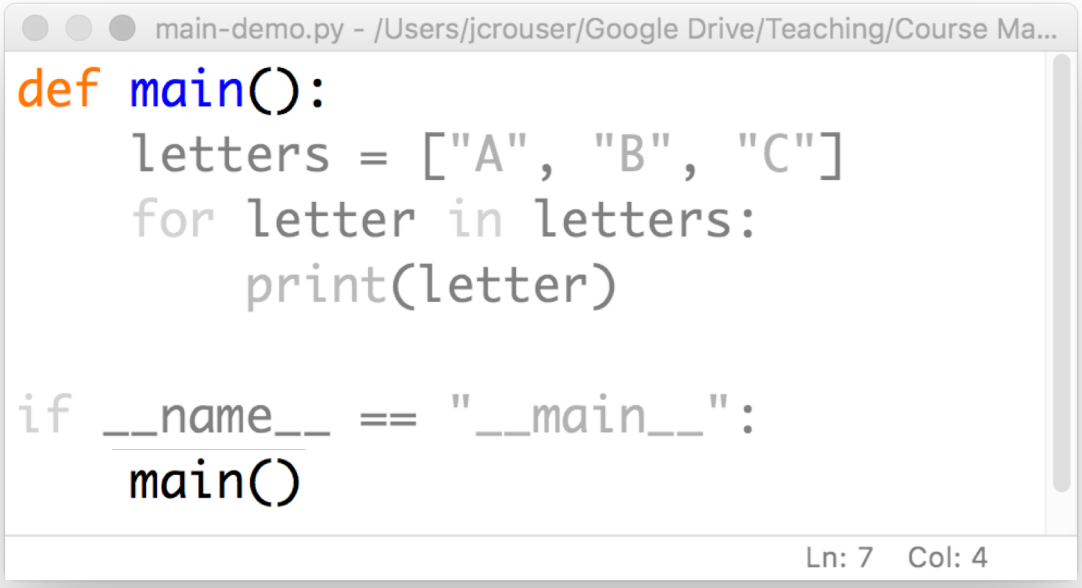
Python convention

- We can use an **`if`** statement to tell python to call the **`main()`** function only if the program is being run directly



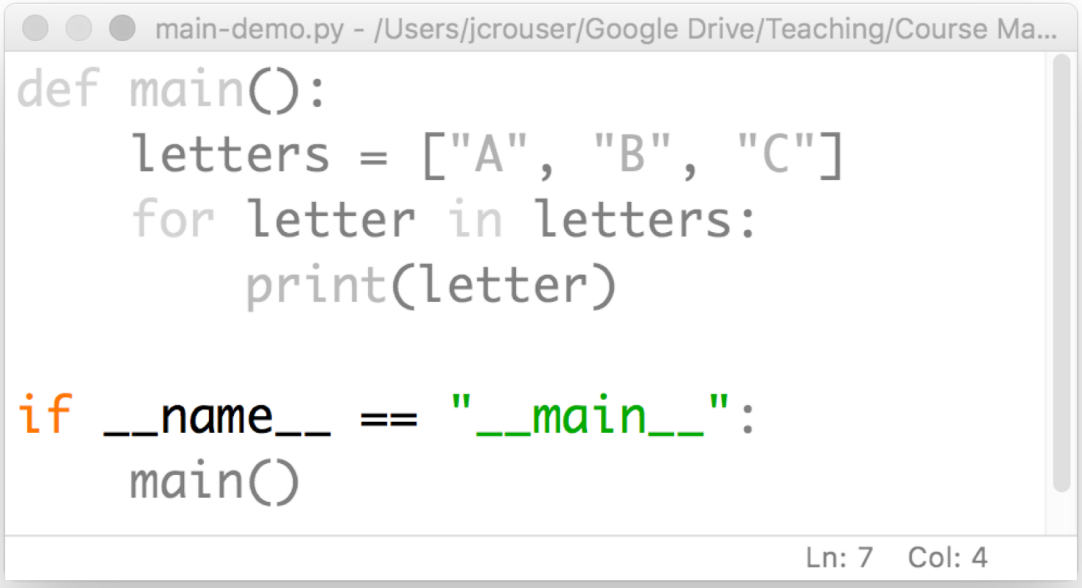
Python convention

- This is a little bit **confusing**: we named the function we created to hold our program was called **`main()`**



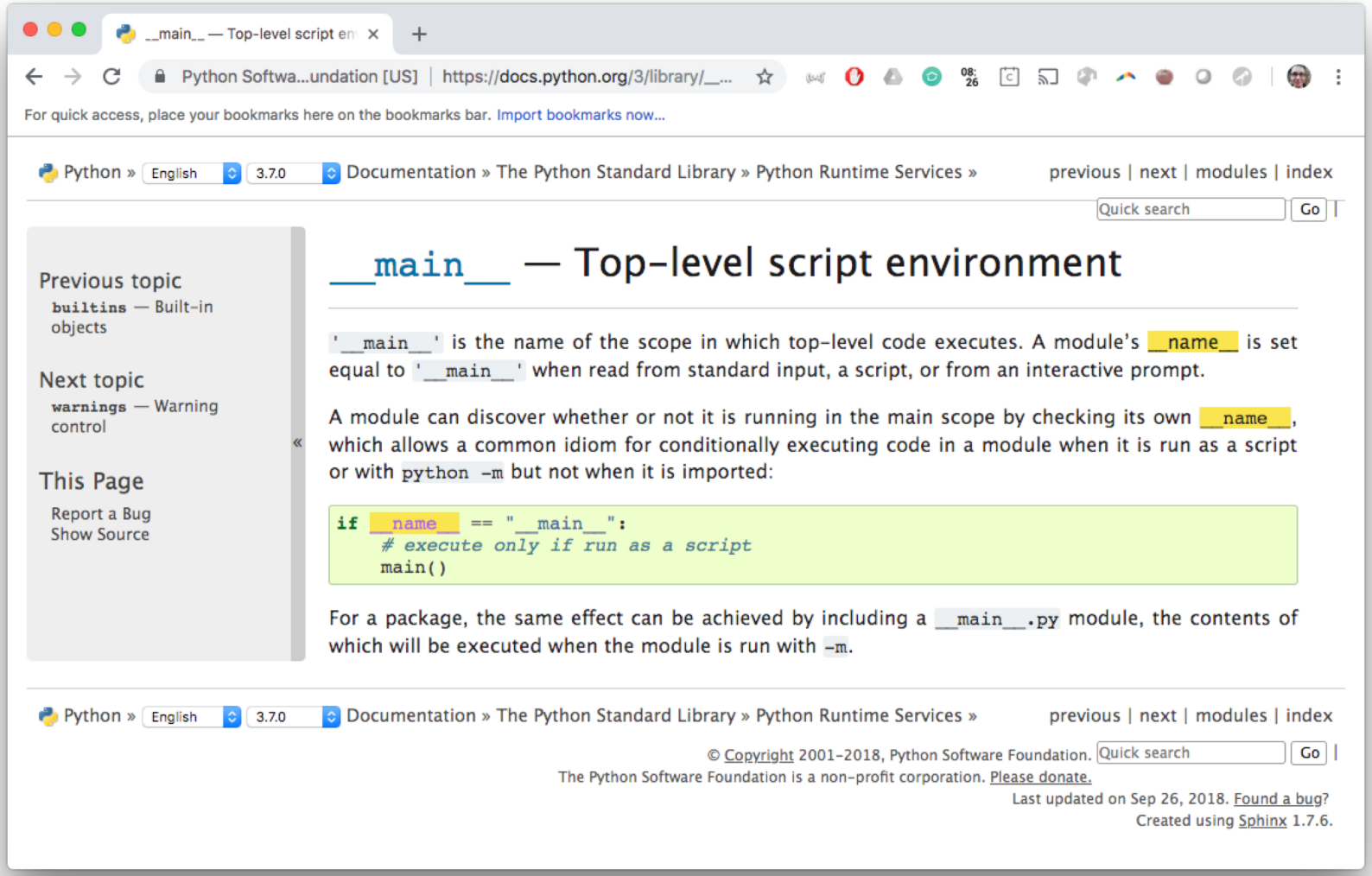
Python convention

- In our **`if` statement**, we're asking whether some variable called **`__name__`** is equal to the string **`"__main__"`**



- (not to mention I don't recall initializing anything called **`__name__`**...)

To the documentation!




DEMO
TIME

15-minute exercise

- Write a program that contains a `main()` function, which contains instructions for printing out the phrase:

```
"Today is not mountain day :-("
```

- Use an `if` statement combined with checking the value of the `__name__` variable to call `main()` only when the program is run directly
- Add an `else` statement so that whenever the program ("module") is `import`ed, it prints out the phrase:

```
"Maybe today...?"
```

Discussion

What did you come up with?

Takeaways

- Programs (“modules”) that are well-organized are **easier to read**, more **versatile**, and potentially **more efficient**
- The first step we’ll take toward organizing our code is to include a `main()` function, which includes the instructions we want our program to run
- To make it easier to `import` code we write now into later modules, we will follow the convention of including:

```
if __name__ == "__main__":
    main()
```

at the end of each module

Takeaways

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```

at the end of each module

Helpful tip: have a starter template

starter.py - /Users/jcrouser/Google Drive/Teaching/Course Material/CSC111/CSC111/demos/start...

```
#-----------------------------------------------
#       Names: Jordan Crouser & <PARTNER>
#        Date: <DATE>
#    Filename: starter.py
# Description: This is a demonstration of how to
#              organize your starter code (incl.
#              a main function and scope check)
#-----------------------------------------------

def main():
    # This is where my code will go

if __name__ == "__main__":
    main()

# REFERENCES
```

Ln: 3 Col: 21

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