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CSCI-UA-0002

Intro to Computer Programming (No Prior Experience)

Module 1: Variables, Statements, Etc...

Professor Emily Zhao

Section 008	Section 012
T/R 12:30-1:45PM	T/R 4:55-6:10PM

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Agenda

- Classroom Agreements
- Review Questions
- **Module 1 Review**
- Pseudo-Code/Commenting
- **Introduce Assignment 1**

Classroom Agreements

For both the teacher and the students:

- Be engaged and communicate your needs.
- Don't be afraid to ask for help and offer help when warranted.
- Be timely.
- Put forth your best effort.
- Practice respect and non-judgment. We come from many different backgrounds, are starting in different places, go at unique paces, and each have our own personal lives.
- One mic: one person speaks at a time. Listen without interruption.
- Any and all questions are valid – there is no such thing as a "stupid" question.

Class Website

http://bit.ly/python-with-emily

Module 1

— Setting up IDLE	→ *What are the different modes?*
— Numeric vs string literals	→ *What are the differences between them?*
— Variables	→ *What are the rules for naming them?*
— Functions + Function Calls	→ *What does it mean to "call" one?*
— The `print()` function	→ *What is `end` and `sep`?!*
— The `input()` function	→ *What does the input function return?*
— Math operators	→ *Where do you do your math operations?*

Additional question(s)

→ *What (the heck) is `\n`?*

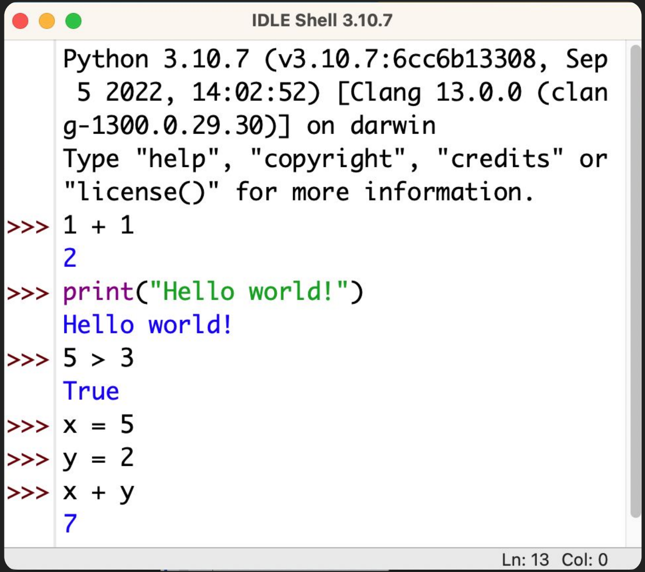
→ *What is the difference between `\` and `/`?*

Installing Python/IDLE

IDLE (Integrated DeveLopment Environment)

Interactive Mode

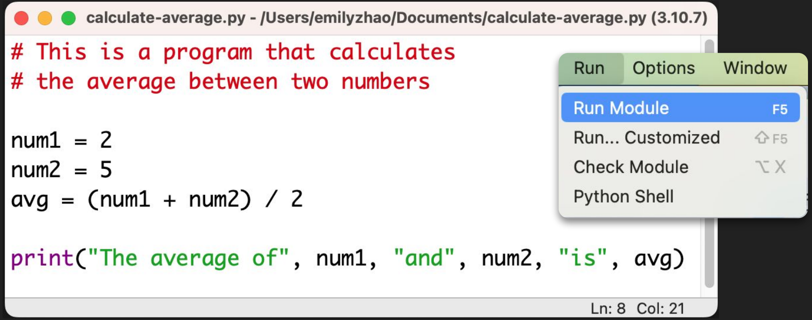
Commands are immediately processed as they are received



```
Python 3.10.7 (v3.10.7:6cc6b13308, Sep
 5 2022, 14:02:52) [Clang 13.0.0 (clan
g-1300.0.29.30)] on darwin
Type "help", "copyright", "credits" or
"license()" for more information.
>>> 1 + 1
2
>>> print("Hello world!")
Hello world!
>>> 5 > 3
True
>>> x = 5
>>> y = 2
>>> x + y
7
```

Script Mode*

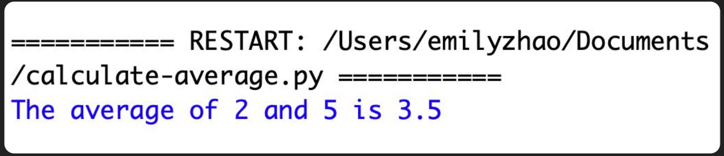
Write a program (save as a "text file" on your computer) and run it whenever you like



```python
# This is a program that calculates
# the average between two numbers

num1 = 2
num2 = 5
avg = (num1 + num2) / 2

print("The average of", num1, "and", num2, "is", avg)
```



```
=========== RESTART: /Users/emilyzhao/Documents
/calculate-average.py ===========
The average of 2 and 5 is 3.5
```

* *we will mostly be using script mode*

Numeric vs String literals

String Literals

a sequence of characters that can contain letters, numbers, symbols and even spaces

must be enclosed in matching *delimiters*

```
# Examples of valid strings

greeting = 'hello'
greeting2 = "hola"
greeting3 = '''bonjour'''
```

Numeric Literals

used to represent numbers in a program (i.e. integers, floating point numbers and complex numbers)

```
# Examples of valid numeric literals

x = 5
PI = 3.14
```

Variables

Variables

"Buckets" that can store information in your computers memory

```
speed = 5
```

```
myName = "Emily"
```

Naming Variables

- can't use Python's "reserved" words
- can't contain spaces (can use "_" in place) or special characters (!@#$%^&*)
- can only start with a letter or underscore; can be followed by any alphanumeric character after that

Python Reserved Words

'False', 'None', 'True', 'and', 'as', 'assert', 'break', 'class',
'continue', 'def', 'del', 'elif', 'else', 'except', 'finally', 'for', 'from',
'global', 'if', 'import', 'in', 'is', 'lambda', 'nonlocal', 'not', 'or',
'pass', 'raise', 'return', 'try', 'while', 'with', 'yield'

Legal or Illegal variable name?

```
class = 2
```

```
class_avg = 70
```

```
classAvg = 99
```

```
_class_avg = 99
```

```
2ndclassavg = 88
```

```
classavg! = 99
```

Legal or Illegal variable name?

`class = 2` → ❌ `class` is reserved

`class_avg = 70` → ✅

`classAvg = 99` → ✅

`_class_avg = 99` → ✅

`2ndclassavg = 88` → ❌ cannot start with number

`classavg! = 99` → ❌ alphanumeric only

Common Variable Naming Conventions

`roccketttopspeed = 100` → valid, but hard to read

`rocket_top_speed = 100` → underscored

`rocketTopSpeed` → camelCase

Functions

Functions

You can think of functions like verbs!

1) They DO things
2) They RETURN things

- We will learn how to write functions later in class
- For now, we will "call" or use Python’s pre-written functions

Anatomy of a function you call

```
functionName(<arguments>)
```

```
print()
```

```
print(value, …, sep=" ", end="\n")
```

```
input(prompt)
```

The `print()` function

What it does: prints objects to the shell
What is returns: nothing

Defaults:

- Separates objects with a space (`sep=" "`)
- Ends each line with a new line (`end="\n"`)

Examples of `print()`

```
print()
# prints a new line

print("hello", end="")
print("there", end="")
# prints "hellothere"

print("hello", "there", sep="*", end="!")
print("goodbye", "now", sep="*", end="!")

# prints hello*there!goodbye*now!
```

The `input()` function

What it does: asks the user for input with prompt
What is returns: the user input as a <u>string</u>

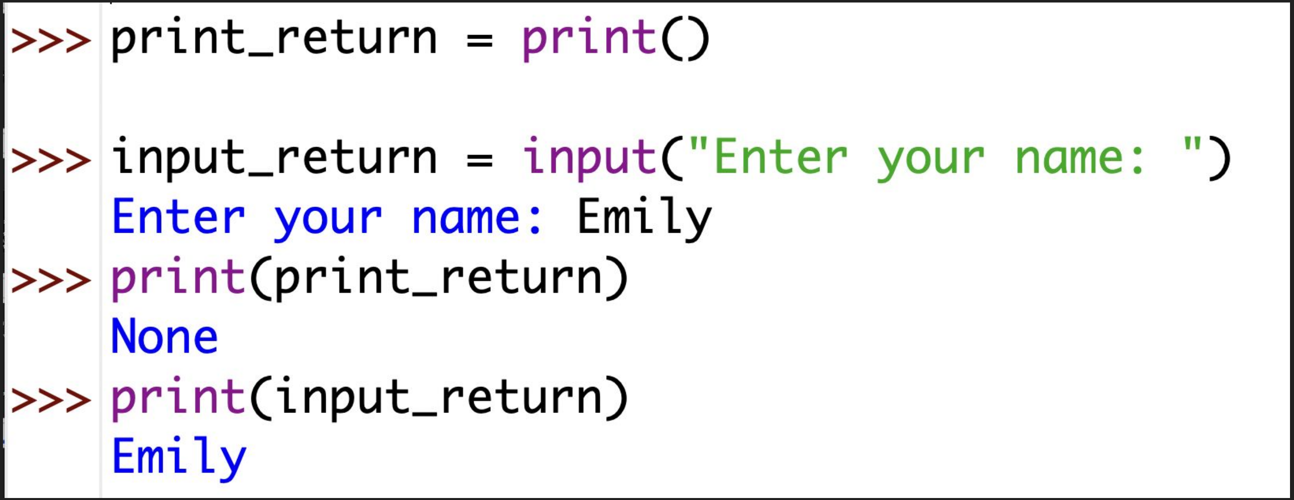
```
name = input("What's your name? ")
print("Hello,", name, end="!")
-----------------------------------
>>> What’s your name? Emily
>>> Hello, Emily!
```

Functions

You can think of functions like verbs!

1) They DO things
2) They RETURN things

If your function returns a value, you must store the value!

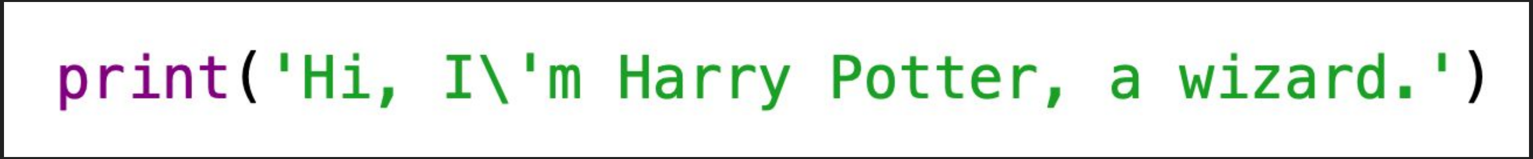


```
>>> print_return = print()

>>> input_return = input("Enter your name: ")
    Enter your name: Emily
>>> print(print_return)
    None
>>> print(input_return)
    Emily
```

Escape Characters

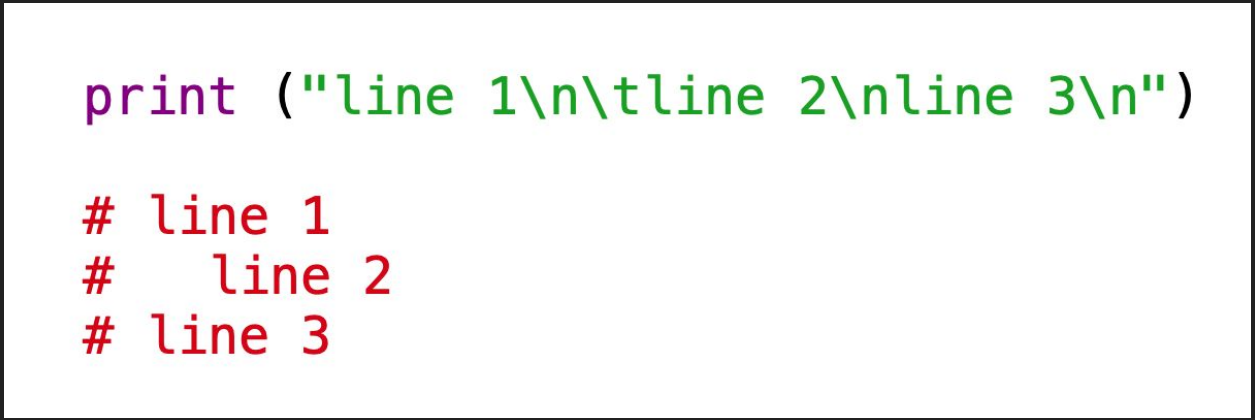
- An “escape character” allows you to perform special actions inside the confines of a delimiter
- In Python, the escape character is `\`
- It causes Python to treat the next character as “special”



```python
print('Hi, I\'m Harry Potter, a wizard.')
```

Escape Characters

- There are a number of special characters you can use in conjunction with the escape character to perform special string operations
- `\n` forces a line break
- `\t` creates a tab

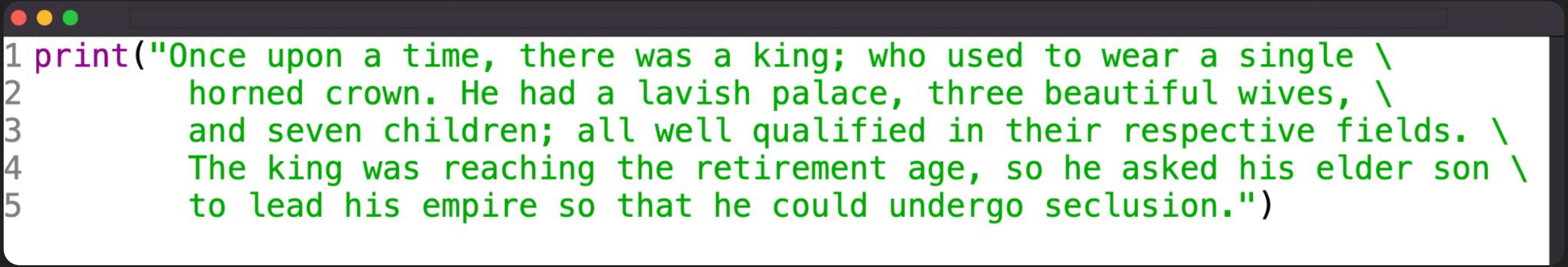


```
print ("line 1\n\tline 2\nline 3\n")

# line 1
#   line 2
# line 3
```

Line Continuation

- Sometimes the code you write can get very long
- You can use the `\` symbol to indicate to Python that you would like to continue your code onto another line



```python
print("Once upon a time, there was a king; who used to wear a single \
        horned crown. He had a lavish palace, three beautiful wives, \
        and seven children; all well qualified in their respective fields. \
        The king was reaching the retirement age, so he asked his elder son \
        to lead his empire so that he could undergo seclusion.")
```

Programming Challenge

```
item1 = Bread
item2 = Eggs
price1 = $2.99
price2 = $1.99

# Desired Output:
# Item: Bread, Price: $2.99
# Item: Eggs, Price: $1.99
```

Programming Challenge: Make a Mad Lib

Write a program that asks the user to type in 4 different words using the following prompts:

- `enter a noun`
- `enter a verb`
- `enter an adjective`
- `enter an adverb`

Output the following text:

```
The [adjective] [noun] was very hungry, so it decided to [adverb] [verb] to the nearest restaurant.
```

Homework

- Self-Paced Learning Module #2 (due next class)
- Quiz #2 (due next class by 12:30PM)
- Ask a question on Ed
- Assignment #1 (due in one week)