

# Getting Started

CAC 180

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What is a program?

# Program

- It's like a recipe
- It's step-by-step instructions for the computer to process
- It generally includes an input, which is processed by the *algorithm* and the result is then the output

# Why Python?

- Consistently a top language ranked by developers and IEEE
- Interpreted language
- High-level data structures built in, Dynamic Typing, Dynamic Binding
- Rapid Application Development
- Scripting
- Extensive library

# Vocabulary

- Statement
- Variable
- Data type
- Assignment
- Input
- Output
- Expression
- Syntax Error
- Runtime Error
- Logic Error

# Statement

- Program instruction
- This is a declaration you are making to the computer
- It is one command that you are instructing the computer to execute
- One statement per line
  - Other languages (e.g., Java, C#, c++) have a semi-colon at the end of a statement (like a period)
  - This allows a programmer to write more than one command on a line, but for readability, programmers generally write one command per line



# Variable



- Named space in memory to store information
- Think about it like a locker: you know the number of your locker, when you need a book, you go to your number locker, and you take the book you need
- Variables can store a variety of information such as strings, integers, floats, and boolean values

# Data Type

- String: letters or words, denoted by single or double quotes
- int: whole numbers
- float: decimal numbers
- boolean: True or False
- You can change types...a string can be turned into a number: `int(myString)` BUT BE CAREFUL!
- A number can be turned into a string: `str(myNumber)`





# Variable Names

This is HUGE!

- You get to name your variable...but you have to follow some rules
  1. Must start with a letter or underscore: typically a lowercase letter, capital letter and all caps have different meanings
  2. Can only be one word: use Pascal casing or underscore to combine words
  3. Must not be a reserved word: if the name you type appears in an unusual color, it is reserved
  4. Variable name can only be used once (kind of confusing...will describe more later)

# Assignment

- This is the idea of associating a value to your variable (putting the book in your locker)
- Format:

*variable\_name = value*

name = 'Wagner'

count = 5

average = 4.5

- Format:

`print()` - prints a blank line

`print('apple')` - prints the word apple and then goes to the next line

`print('apple', end = ' ')`  
`print('pie')` - prints apple pie

`year = 2020`  
`print('The year is', year)`

Words in quotes  
are called string  
literals - you are  
telling the computer  
to literally print that value

# Input

- Prompts the user to enter information
- You're collecting information from the user...you have to remember that information somewhere
- Where do you put it?

# Input

- Prompts the user to enter information
- You're collecting information from the user...you have to remember that information somewhere
- Where do you put it?
  - Yes! In a variable! =)
- Format:

You do not have  
to include a prompt

```
name = input('Please enter your name: ')
```

# Expressions

- An expression is any calculation you command the computer to perform
- Examples:

`average = (5+3+7)/3`

`fullName = firstName + ' ' + lastName`

# Symbols

- Addition (words and numbers): +
- Subtraction: -
- Multiplication: \*
- Division: /
- Modulus: %
- Integer or Floor Division: //

# Syntax Error

- Like a spelling error
- It occurs when a programmer breaks the rules of the language
- Example: What's wrong with the following?
- `print 'hello'`
- `color = blue`
- `input('Enter a number: ')`



How might you avoid a  
ton of syntax errors in  
your code?

# Runtime Error

- An error that causes a program to crash while running
- Can be tough to find.
- Most common mistake is to ask the user for a value, and the code immediately converts the value to an integer, but the user entered a string.

# Logic Error

- This is an error in the algorithm
- The solution to the problem is incorrect. For example:
  - addition may be used instead of multiplication
  - the wrong divisor could be used

Which do you think is the  
hardest type of error to  
identify?

If you don't already have a Python IDE on your computer fo to [repl.it](https://repl.it) and select Python 3.

1. Print "Hello world!"
2. Print your mailing address, formatted as you would see it on an envelop
3. Ask the user to enter his/her name, print the user's name
4. Ask the user to enter his/her name, print "Hello, \_\_\_\_\_!"
5. Ask the user to enter his/her name and the date. Print "Hello, \_\_\_\_\_. Today is \_\_\_\_\_."

# Next Class

- All About Me
- Lab Friday
- Read ZyBook Chapters 1 and 2