GWC Week 2

Data Types and Variables

Math in Python

You can do simple (and hard) math computations using programming.

Addition: 4 + 5

Subtraction: 7 - 6

Multiplication: 5*6

Division: 20 / 2

Exponents: 3**2 is 3 to the power of 2

What are Values in python?

Values:Letters, Numbers, Boolean

1,2,3, 4.5, “Hello”, True/False

Each value has a type in python:

int:integers or whole numbers (do not have decimal values)

float:floating-point numbers that have decimals like 2.3 or pi(3.14159…)

str: Strings: letters or words surrounded by “” “Hi”

Values(continued)

Bool: Booleans are values that measure if something is true or false

```
5 == 6 is False.
```

Examples

Type the following into JDoodle to test value types:

```
print(type(3))

print(type(“Hello”))

print(type(3.1415))

print(type(4/5))

print(type(True))
```

Variables

- Variables are placeholders for values using = as the assignment operator (NOT TO BE CONFUSED WITH ==)
- Variables can be named anything but should follow industry guidelines:
  - Usually lowercase
  - No length restriction
  - CANNOT start with a number
  - Use underscore (_) for multiple words (a_num)
  - Cannot contain a python keyword like type()

Examples

```
x = 1

y = 2

print(x+y)
```

```
name = “Katie”
print(“Hi” + name)
```

```
a = “hi”

print(a)
```

```
age = 19
years_to_graduate = 3
print(“You will graduate when you are ”
+ (age + years_to_graduate) +” years
old”)
```

Comments

- When writing long programs that other people may work with, you should write comments to tell people what your code does.
- In python this is done by using a # symbol
- Comments also allow you to stop certain sections of code from executing
  - This is helpful when testing your code
- The # only needs to be on the left side of the code and it doesn't matter how many you type

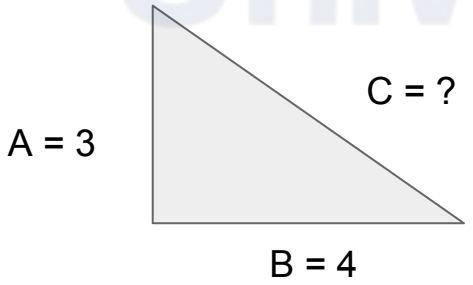
Examples

```
#a = “B”
c = “D”
print(a)
print(c)
```

because this line is commented, your result will print only “D”

Activities

1. Strings!
   a. Print your name and your age
   b. Figure out how to print your name twice using only one print statement
2. Integers!
   a. Find the value of 123 times 4.
   b. Find the value of 99 squared
   c. Find the value of side C in this triangle



Hint ($a^2 + b^2 = c^2$)

Activities Continued

1. Floating-Point Numbers:
   a. Find the value of 99/100

2. Boolean Values!

   b. Type in this code and see what happens:

```
x = 2

y = 3

print(y ==3)
```

Dinner

User Input

- You can program the computer to ask for input.
  - variable_name = input(“Please enter the input: ”)
  - print(variable_name)
  - This will print back your given input
- Anything you give as input will be the value of the variable.
-
```
name = input("What's your name? ")
print("Nice to meet you " + name + "!")
age = input("Your age? ")
print("So, you are already " + str(age) + " years old, " + name + "!")
```

Processing Inputs

- The inputs are always saved as String data-type
- You need to convert the variable to int/float or any other data type you want.
- Try the following code:

```
x = input("Enter a number: ")
y = input("Enter a second number: ")
print('The sum of ', x, ' and ', y, ' is ', x+y, '.')
```

--------This will produce an error----------

Correct Way

```
xString = input("Enter a number: ")
x = int(xString)
yString = input("Enter a second number: ")
y = int(yString)
print('The sum of ', x, ' and ', y, ' is ', x+y, '.')
```

Activity

- Write a program, quotient.py, that prompts the user for two integers, and then prints them out in a sentence with an integer division problem like
  The multiplication of 4 **and** 3 **is** 12

- Write a program that asks for your Birth year and then calculate your age and print your age in following way: “You are x years old” when x is your age.