

GWC Week 4

Review, Math Relation to Coding, Python Libraries



Variables and Data Types

- Each variable you create has a data type
 - Check the data type of your variable by using: `type(your variable goes here)`
- Data types include
 - int: integers (3,4,5)
 - float : floating-point numbers (3.14)
 - bool: boolean algebra (True/False)
 - str: String type or text “Hello World!”



Variables

- Variables are placeholders for values you want to store:
 - They can hold any data type you want
 - Start with a lower-case letter

Your Code ...

```
1 x=10;      #variable x has value 10 which is an integer type
2 y=25;      #variable y has value 25 which is an integer type
3
4 z=x+y;     #variable z will hold the value of the sum of two integers x and y
5
6 print ("sum of x+y =" , z)    #This will print a string data type and the value of variable z
7 |
```



Input Function

- The `input()` function takes an input from the user and stores it into a variable that is declared in your code.
- Functions in coding are similar to functions you use in algebra
 - $f(x) = 5x$
 - `x = input(x)`

Example:

```
x = int(input("Tell me your age"))
```

(this would replace x with the value 19)



Conditional Statements

- Conditional Statements are written in the form:
 - if (one condition), then (do something based on that condition)
 - If today is Tuesday, then there is girls who code class
 - Else: (meaning if it is any day other than tuesday) then we do not have Girls Who Code class.



Python Libraries

- Code libraries are programs that offer built in functions that aid writing programs
 - They are built in or downloaded online
 - There's a library that allows you to order pizza from dominos with python
- We have used one so far: Math
 - <https://docs.python.org/3/library/math.html>
 - to use these libraries you type:

```
import math
```

```
x = math.cos(1)    #this would give you cos(1)= 0
```



Data Types and Variables Activities

1. Print out your name and your age using one print statement.
2. Print out your name and your age using the input() function
3. Using the math library
 - a. Find the value of $\cos(1)$ and $\sin(1)$
 - b. Find the value of the square root of 64
 - c. Find the value of $f(1)$, $f(5)$, and $f(7)$ for the function: $f(x) = 3x^{**2} + \sin(0) + x$



Conditional Statement Activities

1. Using the input function, print out your name if the user enters a string, else if the user enters an integer, print out your age.
2. Using the input function:
 - a. If the user enters a number greater than 6, print out the value times 6.
 - i. Else if the user uses any other number, print out the user input value times $\cos(0)$.



Turtle Python Library

- The turtle python library allows us to create animations using their built in methods.

```
import turtle           # Allows us to use turtles
wn = turtle.Screen()   # Creates a playground for turtles
alex = turtle.Turtle() # Create a turtle, assign to alex

alex.forward(50)       # Tell alex to move forward by 50 units
alex.left(90)          # Tell alex to turn by 90 degrees
alex.forward(30)       # Complete the second side of a rectangle

wn.mainloop()         # Wait for user to close window
```

Source: http://openbookproject.net/thinkcs/python/english3e/hello_little_turtles.html

An IDE that can run turtle: <https://trinket.io/python>

