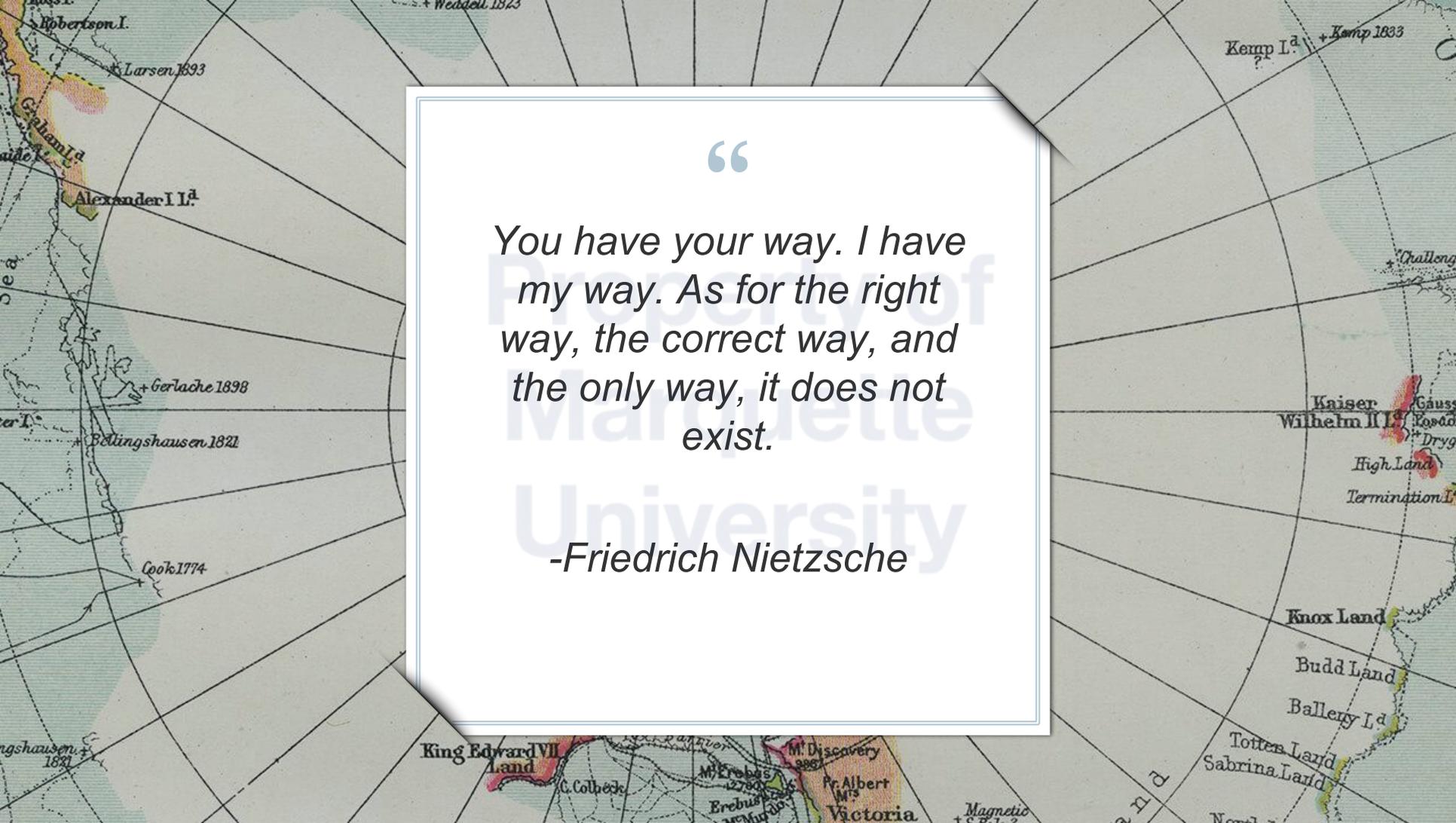


# GWC Week 7 Functions





“

*You have your way. I have  
my way. As for the right  
way, the correct way, and  
the only way, it does not  
exist.*

*-Friedrich Nietzsche*

# Functions in Math



- In math we have functions written in the form:  $f(x)$ ,  $g(x)$ ,  $h(x)$ 
  - $f(x) = 5x$
  - the  $x$  in  $f(x)$  is called a parameter
- Parameters: information that is passed into a function
  - $x = 5$
  - $f(x) = 5x$  is equivalent to  $f(5) = 5(5)$

# Functions in Computer Science



- In computer science, functions allow you to separate parts of code to only run under certain circumstances
- Functions are also called Objects, and will only run unless they are called.
- Functions are helpful in large scale projects that may need to use a piece of code to run more than once
  - Functions can be used like a calculator, once you finish doing one math operation you can clear it and use the machine again to do another math operation

# Pre-Defined Functions



- We have already worked with some pre-built functions that are already defined in python:
  - `type()`
  - `range()`
  - `int(), float()`
  - `print()`
  - `input()`
- A new and Useful pre-built function:
  - `len()` this returns the length of a string `len("hi")` is 2

# Functions

- Here the name of the function is: function1
  - This is defined on line 2
- The function name is defined first and must be followed by ():
- This function is called a void function because it does not have parameters and just performs an action

## Your Code ...

```
1
2 def function1():
3     print("Hello")
4
5 function1()
6
```

## Result...

CPU Time: 0.04 sec(s), Memory: 8392 kilobyte(s)

Hello

# Functions



`print("Hello")` is your function body, it is the code that will run when you call the function

- Indentation matters!
- `function1()` on line 5 is your function call, this code is not indented which means it is not part of the function

## Your Code ...

```
1
2 def function1():
3     print("Hello")
4
5 function1()
6
```

## Result...

CPU Time: 0.04 sec(s), Memory: 8392 kilobyte(s)

Hello

# Functions



Functions can have a default parameter that is assigned when you call the function

- In the code (country) is the default value and then when you call the code with
  - location("USA")
  - "USA" is now assigned to your default value

```
5
6 #func2
7 def location(country):
8     print("I am from: " + country)
9
10 location("United States")
11 location("The Netherlands")
```

Result...

CPU Time: 0.03 sec(s), Memory: 8400 kilobyte(s)

```
I am from: United States
I am from: The Netherlands
```

# Return Statements

- ★ Some functions can return values or lists of values
  - This is done using a return statement
  - Using a return statement will **not** print your result if you use the traditional function call
    - You need to:  
`print(function(args))`

```
13
14
15
16 def add(a,b):
17     return a+b
18     print(add(4,5))
```

## CommandLine Arguments ...

### Result...

CPU Time: 0.04 sec(s), Memory: 8368 kilobyte(s)

9

# Return Statements

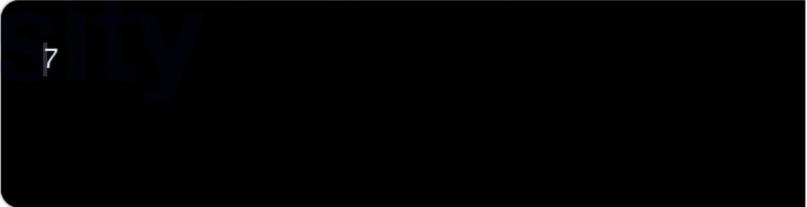


- Using return type functions, you are able to call these functions in another function
- In this example I am able to use an addition function in another function

```
15
16 ▾ def add(a,b):
17     return a+b
18
19
20 ▾ def sub():
21     print(add(4,5) - 2)
22     sub()
23
24
25
```

**Result...**

CPU Time: 0.04 sec(s), Memory: 8504 kilobyte(s)



7

# Activities

1. Write a function with no parameters that will print out your name 5 times
2. Write a function called `func(name)` has a default parameter (name) that will print out:  

```
print("Hi my name is: " + name)
```
3. Write a function that takes 2 parameters and then subtracts the two

# Activities



Write a function that calculates the given values for the equation:  $f(x) = x + 2x$

Find:  $f(2)$ ,  $f(3)$ ,  $f(4)$

HINT:

$$f(2) = 2 + 2*2$$

# Activities



1. Write a function that will use “|” and “+” STRINGS to print this shape:

HINTS:

You can print spaces too

```
print("a" + " "+"b") = a b
```

