Advance Python Pt 1

Research Data Services

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Plans For Today

Learning the basics to python

- **Functions** creating custom functions
- **Script/Libraries** creating script files and custom libraries

```
1
2
3  from myMath import average
4
5  def square(number):
6      return number ** 2
7
8  print(average([1, 5, 6, 3, 5]))
9
10 if __name__ == "__main__":
11     print("Only Run When Not Imported")
```

Functions

Callable code blocks

3 main parts of a function

- Arguments/Parameters
- The Operations
- The Return

Syntax

```
def name(arg1, arg2, ...):
    do this
    do this
    return data
```

Our First Function

Will only run when we call it

```
def name():
    print("Hello Mark")

name()
```

Passing Data

We can send data into the function using the arguments

```
def greeting(user):
    print(f"Hello {user}")

greeting("mark")
```

We can also set a default value

```
def greeting(user = "Avery")
    print(f"Hello {user}")

greeting()
greeting("mark")
```

Returning data

We can send data back, but we remember to store it somewhere if needed

```
def greeting(user = "Avery"):
    return f"Hello {user}"

print(greeting())

greet = greeting("mark")
print(greet)
```

We can also return multiple things back

```
def greeting(user="Avery"):
    return f"Hello {user}", f"Hola {user}"

english, spanish = greeting()
print(english)
print(spanish)
```

Exercise One

Create a function that takes 5 numbers

It multiplies together the first and last number

It adds together the middle 3 numbers

Returns the sum, then the product

Then print the sum and product outside the function

Exercise One Code

```
def myFunction(array):
    return array[0]*array[-1], sum(array[1:-1])

multiple, sums = myFunction([5, 3, 7, 1, 10])
print(multiple, sums)
```

Custom Libraries

Libraries in python are files that we import to full functions from

```
import numpy
```

Numpy is a library, but we can make our own

algorithms.py

```
def mean(array):
    return sum(array) / len(array)
```

```
import algorithms

print(algorithms.mean([1, 5, 3, 88, 45, 2]))
```

Exercise Two

Using our own libraries

Create a custom library file and in it:

- Return mean of an array
- Output every vowel in a string
- Return the reverse of a string

Import that file to another file and use all 3 functions

Exercise Two

myLibrary.py

```
def mean(array):
    return sum(array) / len(array)

def vowels(string):
    string = string.lower()
    for i in string:
        if i in ["a", "e", "i", "o", "u", "y"]:
            print(i)

def reverse(string):
    reversed_string = ""
    for i in string:
        reversed_string = i + reversed_string
    return reversed_string
```

```
from myLibrary import mean, vowels, reverse

print(mean([1, 5, 3, 6, 1]))
vowels("Hello WOrld")
print(reverse("Race car"))
```

Script Files

The one thing about importing files is that everythin in that file will run

myLibrary.py

```
# Below the previous file

print("Hello World")
print("I am running depite being imported")
```

Those lines will run every time we import the file

```
if __name__ == "__main__":
    print("Hello World")
    print("I am running depite being imported")
```