

# Python Programing Basics

## 1. Background

The Python programing language is used the main programing language for the course GEOG479. In particular, we will write python scripts to use Hadoop Streaming API, interact with Spark, as well as data analytics using Pandas and scikit-learn, etc.

## 2. Basics to get started program in Python

- Function

```
def function_B(parameter1, parameter2, parameter3):
```

```
    result = parameter1 + parameter2 + parameter3
```

```
    return result
```

```
def function_A():
```

```
    output = function_B(1,2,3)
```

```
    if output > 10:
```

```
        print 100
```

```
    else:
```

```
        print output
```

Pay attention to how to define a function, how to pass parameters, in particular, the indentation

- Lambda function

### **Normal function**

```
def function(x):
```

```
    return x**2
```

```
>> function (2)
```

Or you can use a **lambda function**

```
r = lambda x: x**2
```

```
>> r(2)
```

### Embed lambda function in a normal function

```
def make_incrementor (n):
```

```
    return lambda x: x + n
```

```
>> f = make_incrementor(2)
```

```
>> g = make_incrementor(6)
```

```
>>> print f(42), g(42)
```

```
44 48
```

```
>>> print make_incrementor(22)(33)
```

```
55
```

More complicated case with **filter**, **map** and **reduce** functions in Python

```
>> foo = [2, 18, 9, 22, 17, 24, 8, 12, 27]
```

```
>> print filter(lambda x: x % 3 == 0, foo)
```

```
[18, 9, 24, 12, 27]
```

```
>> print map(lambda x: x * 2 + 10, foo)
```

```
[14, 46, 28, 54, 44, 58, 26, 34, 64]
```

```
>> print reduce(lambda x, y: x + y, foo)
```

```
139
```

- Split

```
example1 = "this is a case"
```

```
example2 = "this, is, another, case"
```

```
example3 = "this^is^the^third_case"
```

```
>> result = example.split(" ")
```

```
>> print result
```

```
["this", "is", "a", "case"]
```

```
>> result2 = example3.split("^")
```

What is result2

- Replace

```
example1 = "this is a case"
```

```
example2 = "this, is, another, case"
```

```
example3 = "this^is^the^third_case"
```

```
>> result = example.replace(" ", "xxx")
```

```
>> print result
```

```
"thisxxxisxxxaxxxcase"
```

```
>> result2 = example3.replace("^", ",")
```

What is result2

- List, tuple and dictionary

These are lists: [1,2,4,5], ["student", "name", "whatever"]

These are tuples: (1,2,3), (1,2,"student", "whatever")

These are dictionaries: dict = {'Name': 'Zara', 'Age': 7, 'Class': 'First'};

```
print dict['Name']
```

```
print dict['Age']
```

To be continued ...