Python Basics

Whitespace Is Important

```
In [1]:  listOfNumbers = [1, 2, 3, 4, 5, 6]

         for number in listOfNumbers:
             print(number)
             if (number % 2 == 0):
                 print("is even")
             else:
                 print("is odd")

         print ("All done.")
```

```
1
is odd
2
is even
3
is odd
4
is even
5
is odd
6
is even
All done.
```

Importing Modules

```
In [2]:  import numpy as np

         A = np.random.normal(25.0, 5.0, 10)
         print (A)
```

```
[26.26896031 20.46757767 24.7393334  18.5804176  28.10939893 24.44392283
 22.49569857 33.07079592 26.10290179 23.43825608]
```

Lists

```
In [3]:  x = [1, 2, 3, 4, 5, 6]
         print(len(x))
```

```
6
```

```
In [4]: x[:3]
```

Out[4]: [1, 2, 3]

```
In [5]: x[3:]
```

Out[5]: [4, 5, 6]

```
In [6]: x[-2:]
```

Out[6]: [5, 6]

```
In [7]: x.extend([7,8])
        x
```

Out[7]: [1, 2, 3, 4, 5, 6, 7, 8]

```
In [8]: x.append(9)
        x
```

Out[8]: [1, 2, 3, 4, 5, 6, 7, 8, 9]

```
In [9]: y = [10, 11, 12]
        listOfLists = [x, y]
        listOfLists
```

Out[9]: [[1, 2, 3, 4, 5, 6, 7, 8, 9], [10, 11, 12]]

```
In [10]: y[1]
```

Out[10]: 11

```
In [11]: z = [3, 2, 1]
         z.sort()
         z
```

Out[11]: [1, 2, 3]

```
In [12]: z.sort(reverse=True)
         z
```

Out[12]: [3, 2, 1]

Tuples

```
In [13]:   #Tuples are just immutable lists. Use () instead of []
           x = (1, 2, 3)
           len(x)
```

Out[13]:   3

```
In [14]:   y = (4, 5, 6)
           y[2]
```

Out[14]:   6

```
In [15]:   listOfTuples = [x, y]
           listOfTuples
```

Out[15]:   [(1, 2, 3), (4, 5, 6)]

```
In [16]:   (age, income) = "32,120000".split(',')
           print(age)
           print(income)
```

```
32
120000
```

Dictionaries

```
In [17]:   # Like a map or hash table in other languages
           captains = {}
           captains["Enterprise"] = "Kirk"
           captains["Enterprise D"] = "Picard"
           captains["Deep Space Nine"] = "Sisko"
           captains["Voyager"] = "Janeway"

           print(captains["Voyager"])
```

```
Janeway
```

```
In [18]:   print(captains.get("Enterprise"))
```

```
Kirk
```

```
In [19]:   print(captains.get("NX-01"))
```

```
None
```

```
In [20]:   for ship in captains:
               print(ship + ": " + captains[ship])
```

```
Enterprise: Kirk
Enterprise D: Picard
Deep Space Nine: Sisko
Voyager: Janeway
```

Functions

```
In [21]: def SquareIt(x):
             return x * x

         print(SquareIt(2))
```

4

```
In [22]: #You can pass functions around as parameters
         def DoSomething(f, x):
             return f(x)

         print(DoSomething(SquareIt, 3))
```

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```
In [23]: #Lambda functions let you inline simple functions
         print(DoSomething(lambda x: x * x * x, 3))
```

27

Boolean Expressions

```
In [24]: print(1 == 3)
```

False

```
In [25]: print(True or False)
```

True

```
In [26]: print(1 is 3)
```

False

```
In [27]: if 1 is 3:
             print("How did that happen?")
         elif 1 > 3:
             print("Yikes")
         else:
             print("All is well with the world")
```

All is well with the world

Looping

In [28]:
```python
for x in range(10):
    print(x)
```

```
0
1
2
3
4
5
6
7
8
9
```

In [29]:
```python
for x in range(10):
    if (x is 1):
        continue
    if (x > 5):
        break
    print(x)
```

```
0
2
3
4
5
```

In [30]:
```python
x = 0
while (x < 10):
    print(x)
    x += 1
```

```
0
1
2
3
4
5
6
7
8
9
```

Activity

Write some code that creates a list of integers, loops through each element of the list, and only prints out even numbers!

In [ ]: