

data_types

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```
In [1]: import math
```

0.1 Data Types in Python

The following data types can be used in base python: * **boolean** * **integer** * **float** * **string** * **list** * **None** * complex * object * set * dictionary

We will only focus on the **bolded** ones

Let's connect these data types to the the variable types we learned from the [Variable Types](#) video.

0.1.1 Numerical or Quantitative (taking the mean makes sense)

- Discrete
 - Integer (int) #Stored exactly
- Continuous
 - Float (float) #Stored similarly to scientific notation. Allows for decimal places but loses precision.

```
In [ ]: type(4)
```

```
In [ ]: type(0)
```

```
In [ ]: type(-3)
```

```
In [ ]: #try taking the mean
        numbers = [2, 3, 4, 5]
        print(sum(numbers)/len(numbers))
        type(sum(numbers)/len(numbers)) #In Python 3 returns float, but in Python 2 would return int
```

Floats

```
In [ ]: 3/5
```

```
In [ ]: 6*10**(-1)
```

```
In [ ]: type(3/5)
```

```
In [ ]: type(math.pi)

In [ ]: type(4.0)

In [ ]: # Try taking the mean
        numbers = [math.pi, 3/5, 4.1]
        type(sum(numbers)/len(numbers))
```

0.1.2 Categorical or Qualitative

- Nominal
 - Boolean (bool)
 - String (str)
 - None (NoneType)
- Ordinal
 - Only defined by how you use the data
 - Often important when creating visuals
 - Lists can hold ordinal information because they have indices

Boolean

```
In [ ]: # Boolean
        type(True)

In [ ]: # Boolean
        if 6 < 5:
            print("Yes!")

In [ ]: myList = [True, 6<5, 1==3, None is None]
        for element in myList:
            print(type(element))

In [ ]: print(sum(myList)/len(myList))
        type(sum(myList)/len(myList))
```

String

```
In [ ]: type("This sentence makes sense")

In [ ]: type("Makes sentence this sense")

In [ ]: type("math.pi")

In [ ]: strList = ['dog', 'koala', 'goose']
        sum(strList)/len(strList)
```

Nonetype

```
In [ ]: # None
        type(None)

In [ ]: # None
        x = None
        type(x)

In [ ]: noneList = [None]*5
        sum(noneList)/len(noneList)
```

Lists

A list can hold many types and can also be used to store ordinal information.

```
In [ ]: # List
        myList = [1, 1.1, "This is a sentence", None]
        for element in myList:
            print(type(element))

In [ ]: sum(myList)/len(myList)

In [ ]: # List
        myList = [1, 2, 3]
        for element in myList:
            print(type(element))
        sum(myList)/len(myList) # note that this outputs a float

In [ ]: myList = ['third', 'first', 'medium', 'small', 'large']
        myList[0]

In [ ]: myList.sort()
        myList
```

There are more datatypes available when using different libraries such as Pandas and Numpy, which we will introduce to you as we use them.