

Python Basics

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Variables and Data Types

Variable Assignment

```
x=5
x
```

Calculations With Variables

x+2	Sum of two variables
x-2	Subtraction of two variables
x*2	Multiplication of two variables
x**2	Exponentiation of a variable
x%2	Remainder of a variable
x/float(2)	Division of a variable

Variables and Type Conversion

str()	'5', '3.45', 'True'	Variables to strings
int()	5, 3, 1	Variables to integers
float()	5.0, 1.0	Variables to floats
bool()	True, True, True	Variables to booleans

Help For Help

```
help(str)
```

```
my_string = 'thisStringIsAwesome'
my_string
StringIsAwesome'
```

String Operations

```
my_string * 2
isStringIsAwesomethisStringIsAwesome'
my_string + 'Innit'
isStringIsAwesomeInnit'
'm' in my_string
```

```
>>> a = 'is'
>>> b = 'nice'
>>> my_list = ['my', 'list', a, b]
>>> my_list2 = [[4,5,6,7], [3,4,5,6]]
```

Selecting List Elements

Index starts at 0

Subset

```
>>> my_list[1]
>>> my_list[-3]
```

Select item at index 1
Select 3rd last item

Slice

```
>>> my_list[1:3]
>>> my_list[1:]
>>> my_list[:3]
>>> my_list[:]
```

Select items at index 1 and 2
Select items after index 0
Select items before index 3
Copy my_list

Subset Lists of Lists

```
>>> my_list2[1][0]
>>> my_list2[1][:2]
```

my_list[list][itemOfList]

List Operations

```
>>> my_list + my_list
['my', 'list', 'is', 'nice', 'my', 'list', 'is', 'nice']
>>> my_list * 2
['my', 'list', 'is', 'nice', 'my', 'list', 'is', 'nice']
>>> my_list2 > 4
True
```

List Methods

```
>>> my_list.index(a)
>>> my_list.count(a)
>>> my_list.append('!!')
>>> my_list.remove('!!')
>>> del(my_list[0:1])
>>> my_list.reverse()
>>> my_list.extend('!!')
>>> my_list.pop(-1)
>>> my_list.insert(0, '!!')
>>> my_list.sort()
```

Get the index of an item
Count an item
Append an item at a time
Remove an item
Remove an item
Reverse the list
Append an item
Remove an item
Insert an item
Sort the list

String Operations

Index starts at 0

```
>>> my_string[3]
>>> my_string[4:9]
```

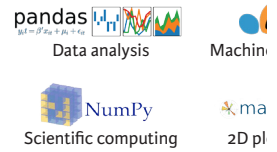
String Methods

```
>>> my_string.upper()
>>> my_string.lower()
>>> my_string.count('w')
>>> my_string.replace('e', 'i')
```

String to uppercase
String to lowercase
Count String elements
Replace String elements

Import libraries

```
>>> import numpy
>>> import numpy as np
Selective import
>>> from math import pi
```



Install Python



Numpy Arrays

Also see

```
>>> my_list = [1, 2, 3, 4]
>>> my_array = np.array(my_list)
>>> my_2darray = np.array([[1,2,3], [4,5,6]])
```

Selecting Numpy Array Elements

Index starts at 0

Subset

```
>>> my_array[1]
2
```

Select item at index 1

Slice

```
>>> my_array[0:2]
array([1, 2])
```

Select items at index 0 and 1

Subset 2D Numpy arrays

```
>>> my_2darray[:,0]
array([1, 4])
```

my_2darray[rows, columns]

Numpy Array Operations

```
>>> my_array > 3
array([False, False, False,  True], dtype=bool)
>>> my_array * 2
array([2, 4, 6, 8])
>>> my_array + np.array([5, 6, 7, 8])
array([6, 8, 10, 12])
```

Numpy Array Functions

```
>>> my_array.shape
>>> np.append(other_array)
>>> np.insert(my_array, 1, 5)
>>> np.delete(my_array, [1])
>>> np.mean(my_array)
>>> np.median(my_array)
>>> my_array.corrcoef()
>>> np.std(my_array)
```

Get the dimensions of array
Append items to an array
Insert items in an array
Delete items in an array
Mean of the array
Median of the array
Correlation coefficient
Standard deviation