This Python cheat sheet will guide you through variables and data types, Strings, Lists, to eventually land at the fundamental package for scientific computing with Python, Numpy.

**Libraries**

**Import libraries**

|  |
| --- |
| import numpy |
| import numpy as np |

**Selective import**

|  |
| --- |
| from math import pi |

**Asking for Help**

|  |
| --- |
| >>> help(str) |

**Variables and Data Types**

**Variable Assignment**

|  |
| --- |
| >>> x=5 |
| >>> x |
| 5 |

**Calculations With Variables**

|  |
| --- |
| Sum of two variables |
| >>> x+2 |
| 7 |
| Subtraction of two variables |
| >>> x-2 |
| 3 |
| Multiplication of two variables |
| >>> x\*2 |
| 10 |
| Exponentiation of a variable |
| >>> x\*\*2 |
| 25 |
| Remainder of a variable |
| >>> x%2 |
| 1 |
| Division of a variable |
| >>> x/float(2) |
| 2.5 |

**Types and Type Conversion**

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

**Strings**

|  |
| --- |
| >>> my\_string = 'thisStringIsAwesome' |
| >>> my\_string |
| 'thisStringIsAwesome' |

**String Operations**

|  |
| --- |
| >>> my\_string \* 2 |
| 'thisStringIsAwesomethisStringIsAwesome' |
| >>> my\_string + 'Innit' |
| 'thisStringIsAwesomeInnit' |
| >>> 'm' in my\_string |
| 'True' |

**Selecting String Characters**

|  |
| --- |
| >>> my\_string[3] |
| >>> my\_string[4:9] |

**String Methods**

|  |
| --- |
| String to uppercase |
| >>> my\_string.upper() |
| String to lowercase |
| >>> my\_string.lower() |
| Count String elements |
| >>> my\_string.count('w') |
| Replace String elements |
| >>> my\_string.replace('e', 'i') |
| Strip whitespace from ends |
| >>> my\_string.strip() |

**Lists**

|  |
| --- |
| >>> a = 'is' |
| >>> b = 'nice' |
| >>> my\_list = ['my', 'list', a, b] |
| >>> my\_list2 = [[4,5,6,7], [3,4,5,6]] |

**Selecting List Elements**

Subset

|  |
| --- |
| Select item at index 1 |
| >>> my\_list[1] |
| Select 3rd last item |
| >>> my\_list[-3] |

**Slice**

|  |
| --- |
| Select items at index 1 and 2 |
| >>> my\_list[1:3] |
| Select items after index 0 |
| >>> my\_list[1:] |
| Select items before index 3 |
| >>> my\_list[:3] |
| Copy my\_list |
| >>> my\_list[:] |

**Subset Lists of Lists**

|  |
| --- |
| my\_list[list][itemOfList] |
| >>> my\_list2[1][0] |
| >>> my\_list2[1][:2] |

**Lists 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**

|  |
| --- |
| Get the index of an item |
| >>> my\_list.index(a) |
| Count an item |
| >>> my\_list.count(a) |
| Append an item at a time |
| >>> my\_list.append('!') |
| Remove an item |
| >>> my\_list.remove('!') |
| Remove an item |
| >>> del(my\_list[0:1]) |
| Reverse the list |
| >>> my\_list.reverse() |
| Append an item |
| >>> my\_list.extend('!') |
| Remove an item |
| >>> my\_list.pop(-1) |
| Insert an item |
| >>> my\_list.insert(0,'!') |
| Sort the list |
| >>> my\_list.sort() |

**Numpy Arrays**

|  |
| --- |
| >>> 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**

**Subset**

|  |
| --- |
| Select item at index 1 |
| >>> my\_array[1] |
| 2 |

**Slice**

|  |
| --- |
| Select items at index 0 and 1 |
| >>> my\_array[0:2] |
| array([1, 2]) |

**Subset 2D Numpy arrays**

|  |
| --- |
| my\_2darray[rows, columns] |
| >>> my\_2darray[:,0] |
| array([1, 4]) |

**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**

|  |
| --- |
| Get the dimensions of the array |
| >>> my\_array.shape |
| Append items to an array |
| >>> np.append(other\_array) |
| Insert items in an array |
| >>> np.insert(my\_array, 1, 5) |
| Delete items in an array |
| >>> np.delete(my\_array,[1]) |
| Mean of the array |
| >>> np.mean(my\_array) |
| Median of the array |
| >>> np.median(my\_array) |
| Correlation coefficient |
| >>> my\_array.corrcoef() |
| Standard deviation |
| >>> np.std(my\_array) |