Python for data science
Cheat sheet

Asking for help

```
>>> help()
```

Python default functions

`len()`	Return length of variable
`type()`	Return type of variable
`abs()`	Return absolute value of variable
`range()`	Return sequence of numbers
`print()`	Print a given message to the screen
`min()`	Return max value of variable
`max()`	Return min value of variable

Variable types and type conversion

`str()`	`'Hello', "5", "True"`	Variables to strings
`int()`	`0, 2, 197653, 13`	Variables to integers
`float()`	`3.1415, 2.0, 1678.98`	Variables to floats
`bool()`	`True, False`	Variables to booleans

Integers and floats

Variable assignment

```
>>> x=5
>>> x
5
```

Integer and float operations

`>>> x+2` `7`	Sum of two variables
`>>> x-2` `3`	Subtraction of two variables
`>>> x*2` `10`	Multiplication of two variables
`>>> x**2` `25`	Exponentiation of a variable
`>>> x%2` `1`	Remainder of a variable
`>>> x/2.0` `2.5`	Division of a variable

Strings

Variable assignment

```
>>> my_string = "this ISaSTRING"
>>> my_string
"this ISaSTRING"
```

String operations

```
>>> my_string * 2
"this ISaSTRINGthis ISaSTRING"
>>> my_string + 'Innit'
"this ISaSTRINGInnit"
>>> 't' in my_string
True
>>> my_string[2]
'i'
>>> my_string[5:9]
'ISaS'
```

String methods

`>>> my_string.upper()` `"THIS ISASTRING"`	String to uppercase
`>>> my_string.lower()` `"this isastring"`	String to lowercase
`>>> my_string.count('s')` `3`	Count string elements
`>>> my_string.replace('s', 'X')` `"thiX IXaIXTRING"`	Replace string elements
`>>> my_string.strip()` `"thisISaSTRING"`	Strip whitespaces
`>>> my_string.split('a')` `['thisIS', 'STRING']`	Split string

Booleans

Variable assignment

```
>>> my_bool = True
>>> my_bool
True
```

Boolean operations

```
>>> my_bool*False
0
>>> my_bool*2
2
```

Lists

Variable assignment

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

Selecting list elements

Subset

`>>> my_list[1]` `'list'`	Select item at index 1
`>>> my_list[-2]` `'is'`	Select 2nd last item

Slice

`>>> my_list[1:3]` `['list', 'is']`	Select items at index 1 and 2
`>>> my_list[2:]` `['is', 'nice']`	Select items after index 2
`>>> my_list[:2]` `['my', 'list']`	Select items before index 2

Subset lists of lists

`>>> my_list2[1][0]` `3`	Select item 0 from list 1
`>>> my_list2[0][1:]` `[5, 6, 7]`	Select items after index 1 from list 0

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('y')` `1`	Get index of item
`>>> my_list.count('i')` `3`	Count an item
`>>> my_list.append('!')` `['my','list','is','nice','!']`	Add an item at the end

Lists

List methods

```
>>> my_list.remove('my')
['list', 'is', 'nice']
```
Remove an item

```
>>> del (my_list[0:1])
['list', 'is', 'nice']
```
Remove an item

```
my_list.reverse()
['nice','is','list','my']
```
Reverse the list

```
my_list.extend('!')
['my','list','is','nice','!']
```
Append an item

```
my_list.pop(-1)
'nice'
```
Select and remove an item

```
my_list.insert(0, '!')
['!','my','list','is','nice']
```
Insert an item at position

```
my_list.sort()
['is', 'list', 'my', 'nice']
```
Sort the list

Sets

Variable assignment

```
>>> my_set={1,2,3,4,5}
>>> my_set2={2,4,6,8}
```

Set operations

```
>>> my_set | my_set2
{1,2,3,4,5,6,8}
```
Union of two sets

```
>>> my_set & my_set2
{2,4}
```
Intersection of two sets

```
>>> my_set - my_set2
{1,3,5}
```
Difference between sets

```
>>> 8 in my_set
False
```
Check if element in set

Set methods

```
>>> my_set.add(10)
{1,2,3,4,5,10}
```
Add element

```
>>> my_set.remove(5)
{1,2,3,4}
```
Remove element

```
>>> my_set.union(my_set2)
{1,2,3,4,5,6,8}
```
Union of two sets

```
>>>my_set.intersection(my_set2)
{2,4}
```
Intersection of two sets

```
>>> my_set.difference(my_set2)
{1,3,5}
```
Difference between sets

Dictionaries

Variable assignment

```
>>> my_dict={"brand": "Ford", "model": "Mustang",
             "year": 1964}
```

Dictionary operations

```
>>> my_dict['model']
'Mustang'
```
Access value by key

```
>>> my_dict['color'] = 'red'
```
Add new value by key

```
>>> 'brand' in my_dict
True
```
Check if key exists

Dictionary methods

```
>>> my_dict.keys()
dict_keys(['brand', 'model', 'year'])
```
Retrieve all keys

```
>>> my_dict.values()
dict_values(['Ford', 'Mustang',
1964])
```
Retrieve all values

```
>>> my_dict.items()
dict_items([('brand', 'Ford'),
('model', 'Mustang'), ('year',
1964)])
```
Retrieve all pairs

Conditionals

if statement

```
>>> a = 3
>>> if a>2:
>>>     print('a is larger than 2')
'a is larger than 2'
```
Check condition. If it is satisfied, run the code underneath

else statement

```
>>> a = 3
>>> if a>2:
>>>     print('a is larger than 2')
>>> else:
>>>     print('a is not larger than
2')
'a is larger than 2'
```
Check condition. It is satisfied, run the code underneath. If it isn't, execute the code under the else

Conditionals

elif statement

```
>>> a = 3
>>> if a>2:
>>>     print('a is larger than
2')
>>> elif a<2:
>>>     print('a is smaller than
2')
>>> else:
>>>     print('a is equal to 2')
'a is larger than 2'
```
Check condition. If it is satisfied, run the code underneath. If it isn't, check next condition. It is satisfied, run the code under the elif. It is isn't, run the code under the else

Functions

def statement

```
>>> def add(x,y):
>>>     return x+y
>>> add(4,17)
21
```
Define function with two input arguments, x and y

```
>>> def add(x,y=17):
>>>     return x+y
>>> add(4)
21
```
Define function with default value for y argument

Loops

for loop

```
>>> for i in range(3):
>>>     print(i)
0
1
2
```
Iterate through the numbers 0 to 2 and print them separately

```
>>> for j in "hello":
>>>     print(j)
'h'
'e'
'l'
'l'
'o'
```
Iterate through the elements of the provided string and print each of them separately

Loops

while loop

```
>>> count = 0
>>> while count < 5: >>>
print(count)
>>> count = count + 1 0
1
2
3
4
```

initialize a counter and print each value separately until it reaches a threshold