



Data Science Cheat Sheet

Python Basics

BASICS, PRINTING AND GETTING HELP

x = 3 - Assign 3 to the variable **x** **help(x)** - Show documentation for the **str** data type
print(x) - Print the value of **x** **help(print)** - Show documentation for the **print()** function
type(x) - Return the type of the variable **x** (in this case, **int** for integer)

READING FILES

```
f = open("my_file.txt", "r")
file_as_string = f.read()
```

- Open the file **my_file.txt** and assign its contents to **s**

```
import csv
f = open("my_dataset.csv", "r")
csvreader = csv.reader(f)
csv_as_list = list(csvreader)
```

- Open the CSV file **my_dataset.csv** and assign its data to the list of lists **csv_as_list**

STRINGS

s = "hello" - Assign the string **"hello"** to the variable **s**

```
s = """She said,
there's a good idea.
"""
```

- Assign a multi-line string to the variable **s**. Also used to create strings that contain both **"** and **'** characters

len(s) - Return the number of characters in **s**
s.startswith("hel") - Test whether **s** starts with the substring **"hel"**

s.endswith("lo") - Test whether **s** ends with the substring **"lo"**

"{} plus {} is {}".format(3,1,4) - Return the string with the values **3**, **1**, and **4** inserted

s.replace("e", "z") - Return a new string based on **s** with all occurrences of **"e"** replaced with **"z"**

s.split(" ") - Split the string **s** into a list of strings, separating on the character **" "** and return that list

NUMERIC TYPES AND

MATHEMATICAL OPERATIONS

i = int("5") - Convert the string **"5"** to the integer **5** and assign the result to **i**

f = float("2.5") - Convert the string **"2.5"** to the float value **2.5** and assign the result to **f**

5 + 5 - Addition

5 - 5 - Subtraction

10 / 2 - Division

5 * 2 - Multiplication

3 ** 2 - Raise **3** to the power of **2** (or 3^2)

27 ** (1/3) - The 3rd root of **27** (or $\sqrt[3]{27}$)

x += 1 - Assign the value of **x + 1** to **x**

x -= 1 - Assign the value of **x - 1** to **x**

LISTS

l = [100, 21, 88, 3] - Assign a list containing the integers **100**, **21**, **88**, and **3** to the variable **l**

l = list() - Create an empty list and assign the result to **l**

l[0] - Return the first value in the list **l**

l[-1] - Return the last value in the list **l**

l[1:3] - Return a slice (list) containing the second and third values of **l**

len(l) - Return the number of elements in **l**

sum(l) - Return the sum of the values of **l**

min(l) - Return the minimum value from **l**

max(l) - Return the maximum value from **l**

l.append(16) - Append the value **16** to the end of **l**

l.sort() - Sort the items in **l** in ascending order

" ".join(["A", "B", "C", "D"]) - Converts the list **["A", "B", "C", "D"]** into the string **"A B C D"**

DICTIONARIES

d = {"CA": "Canada", "GB": "Great Britain", "IN": "India"} - Create a dictionary with keys of **"CA"**, **"GB"**, and **"IN"** and corresponding values of **"Canada"**, **"Great Britain"**, and **"India"**

d["GB"] - Return the value from the dictionary **d** that has the key **"GB"**

d.get("AU", "Sorry") - Return the value from the dictionary **d** that has the key **"AU"**, or the string **"Sorry"** if the key **"AU"** is not found in **d**

d.keys() - Return a list of the keys from **d**

d.values() - Return a list of the values from **d**

d.items() - Return a list of (**key**, **value**) pairs from **d**

MODULES AND FUNCTIONS

The body of a function is defined through indentation.

import random - Import the module **random**

from math import sqrt - Import the function **sqrt** from the module **math**

```
def calculate(addition_one, addition_two,
exponent=1, factor=1):
    result = (value_one + value_two) ** exponent * factor
    return result
```

- Define a new function **calculate** with two required and two optional named arguments which calculates and returns a result.

addition(3, 5, factor=10) - Run the **addition** function with the values **3** and **5** and the named argument **10**

BOOLEAN COMPARISONS

x == 5 - Test whether **x** is equal to **5**

x != 5 - Test whether **x** is not equal to **5**

x > 5 - Test whether **x** is greater than **5**

x < 5 - Test whether **x** is less than **5**

x >= 5 - Test whether **x** is greater than or equal to **5**

x <= 5 - Test whether **x** is less than or equal to **5**

x == 5 or name == "alfred" - Test whether **x** is equal to **5** or **name** is equal to **"alfred"**

x == 5 and name == "alfred" - Test whether **x** is equal to **5** and **name** is equal to **"alfred"**

5 in l - Checks whether the value **5** exists in the list **l**

"GB" in d - Checks whether the value **"GB"** exists in the keys for **d**

IF STATEMENTS AND LOOPS

The body of if statements and loops are defined through indentation.

```
if x > 5:
    print("{} is greater than five".format(x))
elif x < 0:
    print("{} is negative".format(x))
else:
    print("{} is between zero and five".format(x))
```

- Test the value of the variable **x** and run the code body based on the value

```
for value in l:
    print(value)
```

- Iterate over each value in **l**, running the code in the body of the loop with each iteration

```
while x < 10:
    x += 1
```

- Run the code in the body of the loop until the value of **x** is no longer less than **10**