

# PYTHON LIBRARY FUNCTIONS

#### In this chapter you'll learn about:

- Python inbuilt Functions
- How to call such functions
- Pass Parameters to these functions
- How to capture the result

# Python Functions

#### **Python Functions**

- Built-in functions
  - print, input, number & string functions
- Library functions
  - math.min(), math.max(), statistics.median()
- User defined functions
  - Functions we write ourselves

#### Parameters and return value

#### Functions can take one or more parameters

- A value to be used in the function
- e.g. print('Hello World!')

#### Return zero or one result

#### Do stuff!

- Many useful things
- Not there? Write it! (see the next chapter)

A function doesn't always take parameters. For example, it goes and calculates something for which it doesn't need parameters, e.g. a function **get\_pi\_fiveplaces()** returns the value of PI to five decimal places – no parameter necessary.

A function may not return a result. A function to delete a file on disk doesn't need to return anything – though it may be better to return the success or otherwise of the operation.

There are hundreds of built-in functions in the Python main library but it is still very common to write our own to do tasks specific to our needs.

# **About function parameters**

A parameter can be ...

```
• A literal print('Hello World!')
```

- A variable greeting = 'Hello World' print(greeting)
- An expression print(100 \* 0.2)

A literal can be an actual number or a piece of text.

A variable is a container for a value. The print function prints out the value contained in the variable.

An expression is simply a different way of saying "the result of some calculation". In the example the expression evaluates to 10 (2 x 3 = 6 + 4 = 10) so the print function prints 10.

# **Standard Library functions**

- You've seen a few inbuilt functions
  - print, input, len, int, str, float, split
- But there are many more
  - Numeric functions
    - abs, min, max, pow, round
  - String functions
    - capitalize, title, lower, upper
    - Zfill, format, ljust, rjust, center
    - isdigit, startswith, endswith, replace

#### **Built-in Numeric functions**

#### **Numeric Functions**

#### abs(x)

Returns the absolute (positive) value of x

#### max(x1, x2,...)

Returns the largest of its parameters.

#### min(x1, x2,...)

Returns the smallest of its parameters.

#### pow(x, y)

Returns the value of x raised to the power of y. E.g., pow(3,3) = 27 (3x3x3)

#### round(x [,n])

Returns  $\mathbf{x}$  rounded to n digits from the decimal point. Python rounds 0.5 up to 1.0 and rounds -0.5 down to -1.0.

# **Rounding floats**

```
print(round(5.671)) 6
print(round(5.671,1)) 5.7
print(round(5.671,2)) 5.67
print(int(5.671)) 5
```

# Rounding floats – math library

```
import math
print( math.ceil(2000.98))
print( math.floor(2000.98))

ceil(x) the smallest integer >= x
floor(x) the largest integer <= x</pre>
```

# **Formatting Strings**

#### capitalize()

Capitalise first letter of a piece of text.

#### center(width, fillchar)

Centre text within a string, padding with a specified character.

#### len(string)

Returns the length of the string.

#### ljust(width[, fillchar])

Left justify text, padding with a specified character.

#### lower()

Converts all uppercase letters in string to lowercase.

#### upper()

Converts lowercase letters in string to uppercase.

#### zfill (width)

Returns original string left-padded with zeros to a total of *width* characters; intended for numbers

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# **String function examples**

# Split function and IN command

• Split a string into a List by a delimiter

```
city = input('Please enter a city name: ')
if city.lower() in cityList:
    print('Your city is in the list!')
```

# Extracting part of a string

• You can extract part of a List

```
data = [1,3,5,7,9,11,13,15]
print(data[1:5]) [3,5,7,9]
```

And that includes a string

```
word = 'abcdefgh'
print(word[1:5])
```

# Test before casting to int

```
strAge = input('Please enter your age: ')
if strAge.isdigit():
    age = int(strAge)
    print(age + 1)
else:
    print(strAge,'is not a valid age!')
```

What about floats? There is no isfloat() function! One easy way to do this is to remove one decimal point from the string and then test with the isdigit() function. n = "1.2" if n.replace(".", "", 1).isdigit(): print('OK') else: print("No")

# **String format function**

```
name="Bob"
age=21
city="London"

str = "{} lives in {}. He is {} years old".format(name,city,age)

print (str)

Bob lives in London. He is 21 years old

Press any key to continue . . .
```

## **Other Libraries**

- There are 100's of libraries https://en.wikipedia.org/wiki/Category:Python\_libraries
- Here are a few from the statistics

```
import statistics

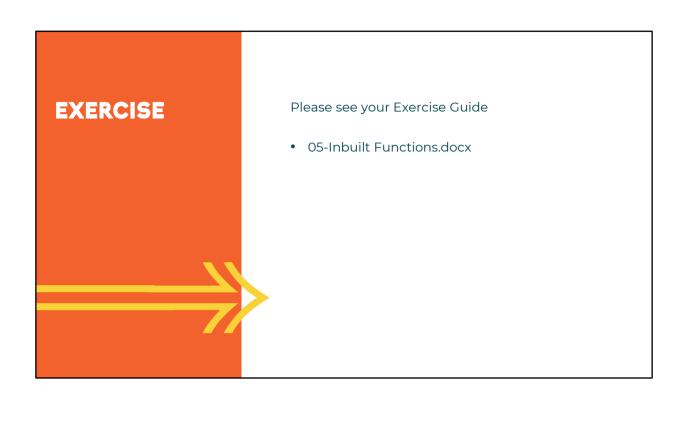
numbers = [99,63,51,7,99,11,23,15,17,8]

print( statistics.mean(numbers) )  # average

print( statistics.median(numbers) )  # middle value

print( statistics.mode(numbers) )  # most common data
```

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# **Further Reading**

- <a href="https://www.python.org/">https://www.python.org/</a>
- <a href="https://www.tutorialspoint.com/python/python\_strings.htm">https://www.tutorialspoint.com/python/python\_strings.htm</a>
- https://docs.python.org/3/tutorial/index.html#tutorial-index

