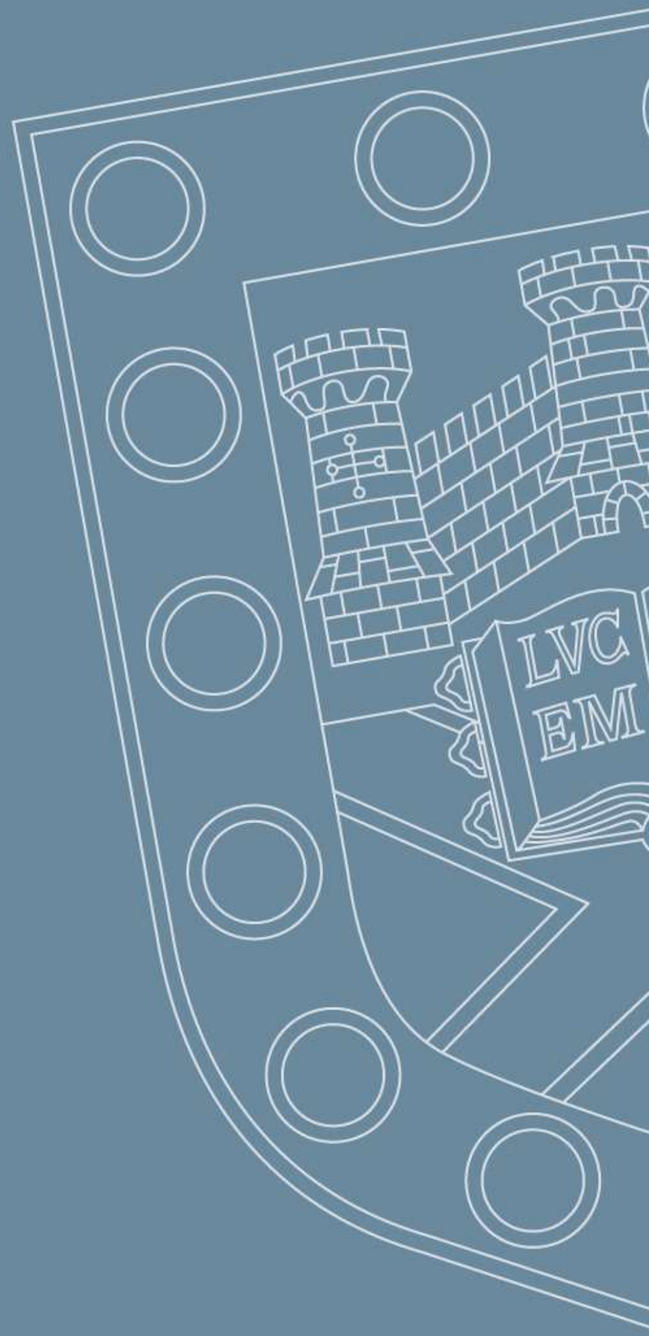
UNIVERSITY OF EXETER

Python programming

Functions



institute of CODING

FUNCTIONS

Return a result that depends on inputs

```
str_len = len("MICHAEL")
smaller = min(9,100,4)
```

In mathematics a function returns the same value if the inputs are the same.

In programming this is a design choice!

FUNCTIONS

There are LOTS of functions you can use

```
for i in range(10):
    a = random()
    print(a)
```

```
0.7331112385630316
0.8877813450720778
0.7002076507733621
0.2123360585748275
0.12886487445614137
0.998667708505465
0.17245545279058372
0.6408933506031753
0.957029564465985
0.7799574836670898
```

FUNCTIONS

Functions are named blocks of code

```
def calculate_area(width, length):
    area = width * length
    return area
```

The syntax is more complicated than for variables, but if you remember a function is a block of code then you will hopefully remember the colon : and the indentation.

FUNCTIONS

Functions can call other functions

```
def calculate_volume(width, length, height):
    volume = calculate_area(width * length) * height
    return volume
```

The built in help(function) prints instructions on functions and modules. A module is a collection of functions (and sometimes other things too).

FUNCTIONS

Arguments and variable “scope”

```
def calculate_area(width, length):
    area = width * length
    return area
```

The names given to arguments (parameter) are used as variable names within the function.

It is recommended you don’t change their values.

Have a go – see what happens!

You can also create new variables. In this example **`area`**

FUNCTIONS

Return value

```
def calculate_area(width, length):
    area = width * length
    return area
```

Functions can have multiple return statements, but exactly one is recommended. After the return statement no more statements within the function are executed.

FUNCTIONS

Advanced arguments

```
def cake_slice(slices=8, radius=20, depth=5):
    # Area of circle = pi * r**2
    area = (3.1415 * 20**2) / slices
    return area * depth
```

Default values can be given to all, or some, arguments.

If only some argument are given, use their name.

```
print (cake_slice(depth=3,slices=4))
```

FUNCTIONS

Exercises

Write your own function and use it

What does help() tell you about your function?

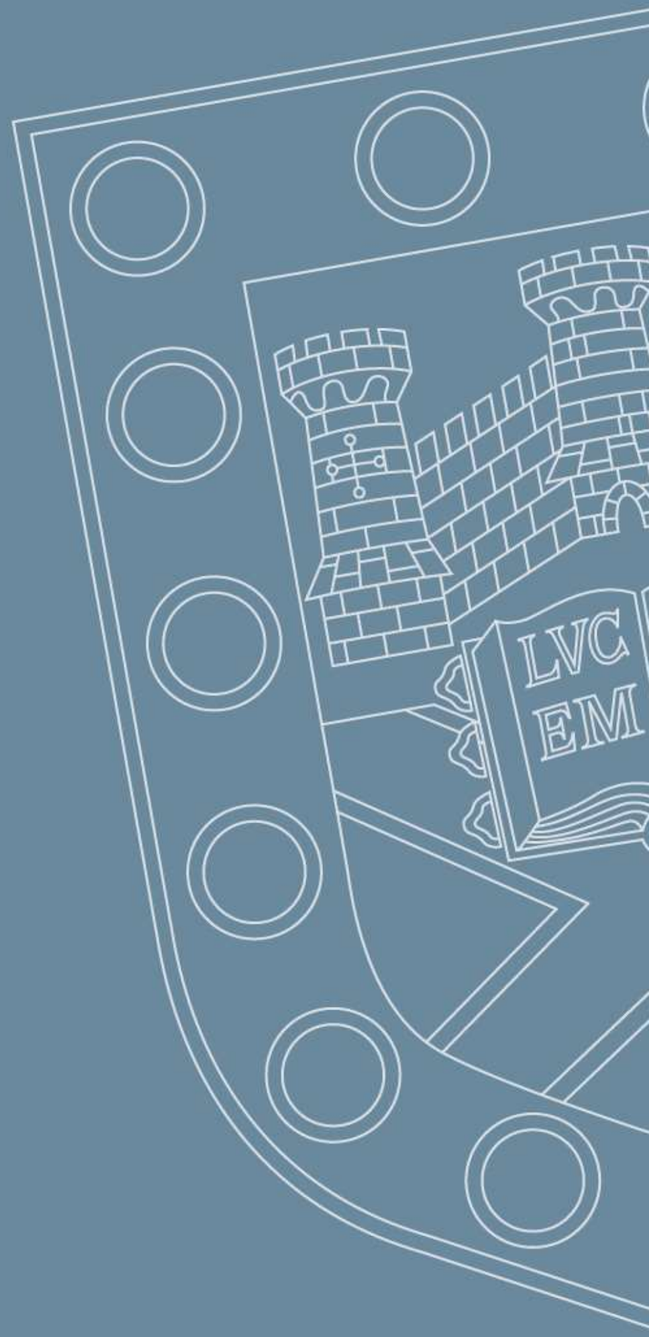
What does help() tell you about built in functions?

Do variables within functions keep their values?

How can you return multiple values from a function?

Re-rewite your function with default paramters

UNIVERSITY OF EXETER



institute of CODING