# Functions

## Exercises

### Week 4

Prior to attempting these exercises ensure you have read the lecture notes and/or viewed the video, and followed the practical. You may wish to use the Python interpreter in interactive mode to help work out the solutions to some of the questions.

Download and store this document within your own filespace, so the contents can be edited. You will be able to refer to it during the test in Week 6.

Enter your answers directly into the highlighted boxes.

For more information about the module delivery, assessment and feedback please refer to the module within the MyBeckett portal.

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What must be done before a function that is not *built-in* to Python can be used in a program?

*Answer:*

Use ‘Import’ to bring in external code

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Given the following import statement, how would a call to the sin() function be made?

import math

*Answer:*

result = math.sin(angle)

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Given the following import statement, how would a call to the sqrt() function be made?

from math import sqrt

*Answer:*

result = sqrt(number)

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What is the name of the common library that is available with all Python distributions?

*Answer:*

Python Standard Library

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What keyword is used in Python to define a new function?

*Answer:*

def

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Write some Python code that defines a function called print\_header(msg). This should output the value provided by the ‘msg’ parameter to the screen (prefixed by five asterisk ‘\*\*\*\*\*’) characters.

*Answer:*

def print\_header(msg):

print('\*\*\*\*\*', msg, '\*\*\*\*\*')

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In the answer box below give an example of what the **docstring** may look like for the print\_header(msg) function.

*Answer:*

def print\_header(msg):

"""

Print a message with a header.

Parameters:

- msg (str): Message to display.

Example:

>>> print\_header('Hello, Ashu!')

\*\*\*\*\* Hello, Ashu! \*\*\*\*\*

"""

print('\*\*\*\*\*', msg, '\*\*\*\*\*')

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Where within a function definition should a **docstring** appear?

*Answer:*

The docstring in a function definition should appear right after the function header, which includes the function name, parameters, and return type.

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What statement should appear within a function’s code block to cause a specific value to be passed back to the caller of the function?

*Answer:*

return

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Write some Python code that defines a function called find\_min(a,b) that returns the smallest of the two given parameter values.

*Answer:*

def find\_min(a, b):

"""

Find and return the minimum of two numbers.

Parameters:

- a (float or int): First number.

- b (float or int): Second number.

Returns:

float or int: Minimum of a and b.

"""

return min(a, b)

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Given the following function definition, which of the *formal parameters* could be described as being a **default argument**?

def shouldContinue(prompt, answer=False):

# function body...

*Answer:*

The formal parameter answer can be described as a default argument. This is because it has a default value assigned (False). If the function is called without providing a value for answer, it will use the default value of False.

Provide two example calls to the above function, one which provides a value for the *default argument*, and one that does not.

*Answer:*

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State why following function definition would **not** be allowed.

def do\_something(prefix="Message", prompt, answer=False):

# function body...

*Answer:*

Is not allowed because in Python, when defining a function, default arguments (arguments with default values) must come after non-default arguments. In this case, prompt is a non-default argument, and prefix is a default argument. The default argument (prefix) must always come after the non-default argument (prompt) in the function parameter list.

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What single character is placed directly before the name of a *formal parameter*, to indicate that a variable number of actual parameters can be passed when the function is called?

*Answer:*

We use the asterisk (\*) character directly before the name of a formal parameter. This is known as the "splat" or "star" operator.

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What commonly used built-in function, which displays output on the screen, can take a **variable number** of arguments?

*Answer:*

The commonly used built-in function in Python that can take a variable number of arguments and displays output on the screen is the print() function. The print() function allows us to print one or more values to the console, and it can take a variable number of arguments.

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Is it valid for a function’s parameter name to be prefixed by two asterisk characters ‘\*\*’ as shown below?

def send\_output(\*\*details):

# function body...

*Answer:*

Yes, it is valid for a function's parameter name to be prefixed by two asterisk characters \*\*. In Python, this syntax is used to collect variable keyword arguments into a dictionary.

If present, what does this prefix indicate?

*Answer:*

If a function parameter name is prefixed by two asterisk characters \*\*, it indicates that the parameter is designed to collect any additional keyword arguments passed to the function into a dictionary.

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What is the name given to a small ‘anonymous’ function that must be defined using a single expression?

*Answer:*

Lambda Function

Give an example of such a function that calculates the *cube* of a given number (i.e. the value of the number raised to the power of three) -

*Answer:*

cube = lambda x: x\*\*3

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## **Exercises are complete**

Save this logbook with your answers. Then ask your tutor to check your responses to each question.