# Functions

## Exercises

### Week 4

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

*Answer:*

A function must be defined.

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

import math

*Answer:*

import math

result = math.sin(1.0)

print(result)

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

from math import sqrt

*Answer:*

from math import sqrt

result = sqrt(9)

print(result)

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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’ is used to define a new function in Python.

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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, "\*\*\*\*\*")

message = "Hello, this is the header message."

print\_header(message)

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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:*

“””Prints the entered parameter prefixed by 5 asterisks.”””

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

*Answer:*

A docstring should appear as the first statement within a function definition, after the function header.

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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:*

The statement that should appear within a function’s code block to pass a specific value back to the caller is the ‘return’ statement.

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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):

if a < b:

return a

else:

return b

min\_value = find\_min(5, 10)

print(f"The minimum value is: {min\_value}")

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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 default argument in the above function definition is answer.

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

*Answer:*

shouldContinue(prompt)

shouldContinue(prompt, answer=True)

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

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

# function body...

*Answer:*

The function definition would not be allowed because of the uncertainty in default argument, positional argument after keyword argument.

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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:*

Asterisk(\*)

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

*Answer:*

print() function which displays output on the screen 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.

If present, what does this prefix indicate?

*Answer:*

This prefix 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:*

The name given to a small ‘anonymous’ function in Python defined using a single expression is “lambda function” or “lambda expression”.

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:*

def calculate\_cube(\*numbers):

cubes = [num \*\* 3 for num in numbers]

return cubes

result = calculate\_cube(2, 3, 4)

print("Cubes:", result)