# I/O and File Handling

## Exercises

### Week 8

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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Which of the following represents a Python *f-string*?

1. "Hello {}, you have logged in".format(name)
2. "Hello {name}, you have logged in"
3. f"Hello {name}, you have logged in"
4. "Hello %s, you have logged in" % name

*Answer:*

f"Hello {name}, you have logged in"

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Given the following definition of value, what would each of the following statements display?

value = 10.768572

print(f"Value is {value}")

*Answer:*

Value is 10.768572

print(f"Value is {value \* 10}")

*Answer:*

Value is 107.68572

print(f"Value is {value:.2f}")

*Answer:*

Value is 10.77

This is because the `:.2f` in the f-string formats the value to two decimal places, rounding the number to the nearest hundredth, resulting in `10.77`.

print(f"Value is {value:16.2f}")

*Answer:*

Value is 10.77

This happens because the `:16.2f` format specifier formats the value to take up a total width of 16 characters, including the decimal point and two decimal places. Since the number itself takes up fewer characters than 16, the additional spaces are used for padding to reach the specified width.

print(f"Value is {value:0>16.2f}")

*Answer:*

Value is 000000000010.77

Here's a breakdown of the format specification `:0>16.2f`:

- `0>` indicates that it should be padded with zeros (`0`) and aligned to the right (`>`).

- `16` is the total width of the output, including the decimal point and two decimal places.

- `.2f` specifies that the value should be displayed as a floating-point number with two decimal places.

As a result, the number is displayed as `000000000010.77`, with zeros added as padding to fill the width up to 16 characters.

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Within an *f-string* **format specifier** what does the ‘^’ alignment character signify?

*Answer:*

In Python f-string format specifiers, the ^ alignment character signifies center alignment within the specified width.

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Write a statement which uses the str.format() to generate the same output as the following *f-string* statement -

print(f"pi to 5 decimal places is {math.pi:.5f}")

*Answer:*

import math

print("pi to 5 decimal places is {:.5f}".format(math.pi))

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What would the following statement display?

print("Length = {1} Width = {0}".format(10,20))

*Answer:*

Length = 20 Width = 10

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What *exactly* would the following statement display?

print("Hello".rjust(10))

*Answer:*

The rjust() method in Python is used to right-align a string within a specified width by adding spaces (or any specified character) to the left of the string to reach the given width.

So the result will be:

Hello

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On which older programming language is the *%-formatting* style loosely based?

*Answer:*

The %-formatting style used in Python for string formatting is loosely based on the printf function from the C programming language

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Write a Python program that uses a loop and the str.rjust() method to generate the following output.

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*Hint:* The program will start as follows

for n in range(10,0,-1):

line = "#" \* n

# rest of code....

*Answer:*

for n in range(10, 0, -1):

line = "#" \* n

print(line.rjust(10))

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What is the basic element that *all* computer files contain?

*Answer:*

The basic element that all computer files contain is data.

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What *function* must be called before the contents of a file can be accessed?

*Answer:*

In order to access the contents of a file in most programming languages, including Python, you need to open the file using the open() function.

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What *method* must be called on a file object once processing is complete?

*Answer:*

Once processing is complete on a file object in most programming languages, including Python, it is considered good practice to close the file using the close() method

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Following execution of the given statement, would the file ‘myfile.txt’ be open for *reading* or for *writing*?

f = open("myfile.txt")

*Answer:*

The given statement f = open("myfile.txt") opens the file 'myfile.txt' in the default mode, which is 'r' (read mode) in Python when no mode is explicitly specified.

Therefore, after the execution of this statement, the file 'myfile.txt' would be open for reading.

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Following execution of the given statement, would the file yourfile.txt be open for *reading* or for *writing*?

f2 = open("yourfile.txt", "w")

*Answer:*

Following the execution of the statement f2 = open("yourfile.txt", "w"), the file 'yourfile.txt' will be open for writing.

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Following execution of the given statement, what would be the *mode of operation* applied to file gfxlib.so ?

f3 = open("gfxlib.so", "r+b")

*Answer:*

The statement f3 = open("gfxlib.so", "r+b") opens the file named 'gfxlib.so' in read and write binary mode with the ability to read and modify its contents ("r+b")

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What is the difference between the two following method calls?

f.readline()

f.readlines()

*Answer:*

f.readline() reads one line at a time, and subsequent calls to it will read the next line.

f.readlines() reads all the lines at once and returns a list containing each line as an element.

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How much of the file content would be read with the following method call?

content = f.read()

*Answer:*

content = f.read() would read the entire content of the file associated with the file object f and store it in the variable content.

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If the variable ‘my\_file’ referred to a text file, what would the following code do?

for next in my\_file:

print(next)

*Answer:*

The corrected code reads each line from the text file referred to by my\_file and prints each line to the console.

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What is the issue with the following code? And how could it be fixed?

f = open("details.txt", "w")

total = 100

f.write(total)

f.close()

*Answer:*

To fix this issue, you should convert the integer total to a string before passing it to the write() method.

Here is the corrected code:

total = 100

with open("details.txt", "w") as f:

f.write(str(total))

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What is the purpose of the file tell() method?

*Answer:*

The tell() method in Python is used to determine the current position of the file cursor within a file.

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What does the following code do?

f.seek(0)

*Answer:*

The code f.seek(0) is used to move the file cursor (file pointer) to a specified position within the file.

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Why is file handling often done using a ‘with’ statement as shown below?

with open("data.txt") as f:

lines = f.readlines()

*Answer:*

The ‘with’ statement is often used to encompass file handling code.

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## **Exercises are complete**

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