# Control Statements

## Exercises

### Week 3

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.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## ©2021 Mark Dixon / Tony Jenkins

What is the *data-type* of the result when evaluating comparison (relational) expressions such as < and >?

*Answer:*

The data-type of the result when evaluating comparison (relational) expressions such as < and > is typically a boolean data type (true or false).

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

For each of the following expressions write the result of their evaluation.

100 < 101

*Answer:*

True

100 > 99

*Answer:*

True

100 >= 100

*Answer:*

True

100 != 100

*Answer:*

False

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

For each of the following expressions write the result of their evaluation.

"abc" < "xyz"

*Answer:*

In most programming languages, when comparing strings, the comparison is performed based on lexicographical (dictionary) order.

In the case of "abc" < "xyz", the comparison is evaluated as true because, in lexicographical order.

The character 'a' comes before 'x'.

"abc" < "XYZ"

*Answer:*

In lexicographical order, lowercase letters have a higher Unicode value than uppercase letters. Therefore, the result of the evaluation for the expression `"abc" < "XYZ"` is `false`.

"100" == 100

*Answer:*

True

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

For each of the following expressions write the result of their evaluation.

10 > 20 and 10 >= 10

*Answer:*

The result of the evaluation for the expression `10 > 20 and 10 >= 10` is `false`.

10 > 30 > 20

*Answer:*

The result of the evaluation for the expression `10 > 30 > 10` is `false`.

40 < 20 or 20 < 30

*Answer:*

The result of the evaluation for the expression `40 < 20 or 20 < 30` is `true`.

not True

*Answer:*

It states the given condition is not true. The not keyword simply flips the truth value of the expression it precedes.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of the following Python statements?

colours = [ "Blue", "Black", "Orange" ]

print("The colour black is in the list : ", "Black" in colours)

*Answer:*

This output results from the use of the in operator in Python. The in operator checks if a specified element is present in a list. In this case, "Black" is indeed present in the colours list, so the statement "Black" in colours evaluates to True.

print("The colour orange is in the list : ", "orange" in colours)

*Answer:*

The colour orange is in the list : False

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Which of the following concepts does the Python ‘if’ statement support?

**Sequence**, **Selection** or **Iteration**?

*Answer:*

Selection

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of the following Python statements?

num1 = 100

num2 = 10

if num1 % num2 == 0:

print("num1 is divisible by num2")

else:

print("num1 is not divisible by num2")

*Answer:*

In this case, num1 is indeed divisible by num2 because the remainder when 100 is divided by 10 is 0. Therefore, the output of this code will be:

num1 is divisible by num2

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of the following Python statements?

num1 = 99

num2 = 70

if num1 < num2:

print("num1 is less than num2")

elif num1 > num2:

print("num1 is greater than num2")

else:

print("num1 is equal to num2")

*Answer:*

The condition num1 < num2 is not true, but the condition num1 > num2 is true. Hence, the output of this code will be:

num1 is greater than num2

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What is the name given to the following type of Python operator shown below?

lowest = x if x < y else y

*Answer:*

The type of Python operator used in the expression lowest = x if x < y else y is called the Ternary Operator.

And, what value would be assigned to the variable ‘lowest’ when ‘x’ was equal to 10 and ‘y’ was equal to 5?

*Answer:*

In the expression lowest = x if x < y else y, when x is equal to 10 and y is equal to 5, the condition x < y (10 < 5) is not true because 10 is not less than 5. Therefore, according to the logic of the conditional (ternary) operator, the value assigned to the variable lowest will be the value of y, which is 5.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Within the answer box below write a small Python program, that asks the user to enter a value between 1 and 10.

Once the value has been input display a message saying whether the value was in the requested range.

Remember: values returned from the **input()** function are *strings*, and need converting before being used within expressions, i.e. you will need code such as this -

num = input("please enter a number between 1 and 10 : ")

num = int(num)

*Answer:*

num = input("Please enter a number between 1 and 10: ")

num = int(num)

if 1 <= num <= 10:

print("The entered value is within the requested range.")

else:

print("The entered value is not within the requested range.")

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Within the answer box below write a small Python program that asks the user to enter two values. Store these in variables called x and y respectively.

If the 'x' value is larger than 'y' then print

The value 'x' is larger than the value 'y'

otherwise print

The value 'y' is larger than the value 'x'

*Answer:*

x = float(input("Enter the first value (x): "))

y = float(input("Enter the second value (y): "))

if x > y:

print(f"The value {x} is larger than the value {y}.")

else:

print(f"The value {y} is larger than the value {x}.")

Examine the output generated by the above program. Is the displayed text entirely accurate in all cases? If not Why?

*Answer:*

The output generated by the provided Python program will accurately indicate which value is larger based on the comparison between x and y.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Within the answer box below write a small Python program that asks the user to enter two values.

Store these values in two variables then output a message displaying the result of dividing the first value by the second value.

Include code that prevents a run-time error being reported when the user inputs a value of '0' for the second input. *Hint:* use an ‘if’ statement

If a '0' value is input, print a message saying "division by 0 is not possible".

*Answer:*

# Taking user input for two values

value1 = float(input("Enter the first value: "))

value2 = float(input("Enter the second value: "))

if value2 != 0:

result = value1 / value2

print(f"The result of dividing {value1} by {value2} is: {result}")

else:

print("Division by 0 is not possible.")

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Which of the following concepts does the Python while statement support?

**Sequence**, **Selection** or **Iteration**?

*Answer:*

The while statement in Python primarily supports the concept of "Iteration."

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of the following Python statements?

num = 5

while num > 0:

print(num)

num -= 1

*Answer:*

5

4

3

2

1

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Write a small Python program that prints your name to the screen 100 times, then enter the program into the answer box below. Hint: use a ‘while’ loop.

*Answer:*

name = "YourName"

counter = 0

while counter < 100:

print(name)

counter += 1

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of the following Python statements?

vals = ["A", "B", "C", "D"]

for letter in vals:

print(letter)

*Answer:*

A

B

C

D

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

What would be the output shown following the execution of each of the following Python statements?

for num in range(5):

print(num)

*Answer:*

0

1

2

3

4

for num in range(10,16):

print(num)

*Answer:*

10

11

12

13

14

15

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

print(num)

*Answer:*

10

9

8

7

6

5

4

3

2

1

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Enter and execute the python code shown below, then show the exact output into the answer box.

for x in range(1,10):

for y in range (1,x):

print("\*")

print()

*Answer:*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

\*

What is the term used to refer to code blocks that appear inside other code blocks as in the above program?

*Answer:*

In programming, the code blocks that appear inside other code blocks are commonly referred to as "nested code blocks" or "nested loops" when specifically talking about loops within loops.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## **Exercises are complete**

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