**Conditionals & logical expressions**

Evaluate the logical expressions. What is output by the program? Remember that the logical expression will be fully evaluated before it is sent to the print() function.

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| --- | --- |
| Code Snippet | Program Output |
| 1 x = "This is a sentence"  2 y = len(x)  3 print(y == 3 or y > 10) | True |
| 1 x = "Hello"  2 y = "Hi"  3 print(x < y) | True |
| 1 x = 25  2 y = 40.5  3 print(x <= 3 and y > 10) | False |
| 1 x = 115  2 y = 115  3 print(x != y) | False |

What do the following logical expressions evaluate to?

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| --- | --- |
| not 100 > 20 and 0 == 0 | False |
| not (100 > 20 and 0 == 0) | False |
| not (not 100 > 20 and not 0 == 0) | True |
| not (100 > 20 and not not 0 == 0) | False |

Suppose the following code is in a larger program, and the variables x and y have been defined. What do we know about the variables x and y at the designated points in the code? (You may ignore y in problems that only have x)

|  |  |  |
| --- | --- | --- |
|  | Point A | Point B |
| if x % 2 == 0 and x > 100:  # point A  print("mouse")  else:  # point B  print("lion")  print("done") | We know that x is greater than 100, and evenly divisible by 2 | Either x is not evenly divisible by 2 or it’s less than 100 or both. |
| if not x \* y < 0:  # point A  print("mouse")  elif y > x:  print("dog")  else:  # point B  print("lion")  print("done") | We know that x\*y is a positive number | We know that y < x and that x\*y is a negative number. |
| if x < 100:  # point A  print("mouse")  if x < 1000:  # point B  print("lion")  print("done") | We know that x is less than 100 (and therefore also less than 1000) therefore both “mouse” and “lion” will be printed | We know that x is less than 1000 but greater than 100, so only “lion” will be printed |

In the following table, first circle each control structure, then write down the output from running the code.

|  |  |
| --- | --- |
| Code | Output |
| s1 = "today"  s2 = "tomorrow"  if not s1.islower():  print("today is tomorrow")  else:  print("that's not how time works") | that's not how time works |
| s1 = "today"  s2 = "tomorrow"  if s1.islower() and s2.islower():  print("today is tomorrow")  elif len(s1) < len(s2):  print("that's not how time works") | today is tomorrow |
| s1 = "today"  s2 = "tomorrow"  if s1.islower() and s2.islower():  print("today is tomorrow")  if len(s1) < len(s2):  print("that's not how time works") | today is tomorrow  that's not how time works |

What is the output of the following program?

|  |  |
| --- | --- |
| def monday\_check(day):  if day != "Monday":  print("It isn’t Monday!")  else:  print("It is Monday!")  def main():  day = "Monday"  monday\_check(day)  monday\_check("Thursday")  monday\_check("monday")  main() | Output:  It is Monday!  It isn’t Monday!  It isn’t Monday! |