

Python Homework Answers

Comparative Operators

Comparative operators are used in Python and other programming languages to compare two values.

This table shows the comparative operators available in Python:

As you can see in the table, the results can either be **True** or **False**.

Operator	Description	Example	Result
<	Less than	4 < 7	True
<=	Less than or equal to	4 <= 3	False
>	Greater than	2 > 8	False
>=	Greater than or equal to	9 >= 5	True
==	Equal to	6 == 6	True
!=	Not equal to	6 != 6	False

What would the result be for the following comparisons in Python?

- a) `>>> 34 > 16` Answer: **True**
- b) `>>> 57 >= 75` Answer: **False**
- c) `>>> 12 == 12` Answer: **True**
- d) `>>> 14 != 24` Answer: **True**
- e) `>>> 0 <= -3` Answer: **False**

Boolean Operators

AND, OR, NOT are all Boolean operators. As with the questions above, the result of a Boolean comparison can only be **True** or **False**. For example, the result of **True and True** would be **True**.

What would the result be for the following Boolean statements?

- f) `>>> True and False` Answer: **False**
- g) `>>> True or False` Answer: **True**
- h) `>>> not False` Answer: **True**
- i) `>>> (True and True) and False` Answer: **False**
- j) `>>> True or not(False)` Answer: **True**

Boolean Logic

The branch of mathematics developed to help us describe logic is named after **George Boole**, an English mathematician (1815 – 1864) who wrote the book “The Laws of Thought” in 1854.

His work on logic laid the foundation for modern digital electronics, essential to the design of all computer systems.

Sometimes we use a ‘**truth table**’ to describe Boolean logic statements. Fill in the missing Results for this truth table below which describes the Boolean **AND** operator. The first one is done for you:

(Hint: the Result is only True when both the First Value and the Second Value are True.)

First Value	Second Value	Result
False	False	False
False	True	False
True	False	False
True	True	True

Fill in the missing Results for this next truth table which describes the Boolean **OR** operator. (Hint: The Result is True if the First Value is True, or if the Second Value is True, or if both values are True.)

First Value	Second Value	Result
False	False	False
False	True	True
True	False	True
True	True	True

Look at the following Python code below.

What output would you expect to see if we ran this program? Write your answer here:

“Division by zero error.” Reason: $value1 > 0$ is True, but $value2 > 0$ is False, therefore the combined result of “ $value1 > 0$ and $value2 > 0$ ” is False, so the if statement will also be False. The program will then run the else: statement, which prints the text “Division by zero error.”

```
value1 = 6
value2 = 0
if value1 > 0 and value2 > 0:
    result = value2 / value1
    print("The result is: ", result)
else:
    print("Division by zero error.")
```