

# Booleans and Conditionals

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## Boolean values

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Boolean values are True and False (note the capitalization). They have a type 'bool' and are like "yes" or "no" in response to a condition.

## Comparison operators

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Comparison operators check the relationship between two values. For example, `x == 5` asks if x is equal to 5. If the statement (comparison) is true, the operator will return True. If the statement is not true, it will return a value of False.

**Note the difference between = and ==. A single = assigns the value on the right to the variable on the left ( `x = 5` ). A double == checks to see if the two sides are equal.**

Operator	Check to see if...
<code>x == y</code>	x is equal to y
<code>x != y</code>	x is not equal to y
<code>x &gt; y</code>	x is greater than y
<code>x &lt; y</code>	x is less than y
<code>x &gt;= y</code>	x is greater than or equal to y
<code>x &lt;= y</code>	x is less than or equal to y

## Logical operators

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Logical operators are `and` , `or` and `not` . They are used with comparison operators to check the relationship between conditions.

For example, `x > 5 and x < 10` returns True if x is both greater than 5 and less than 10. If x is 10, False will be returned because one of the conditions is not met.

Truth tables are commonly used to keep track of the outputs of logical operators.

Truth table for `and` :

a	b	a and b
True	True	True
False	True	False
True	False	False
False	False	False

Truth table for `or` :

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a	b	a or b
True	True	True
False	True	True
True	False	True
False	False	False

Truth table for `not` :

(Note that `not` only requires one operand.)

a	not a
True	False
False	True

## Conditionals

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Conditional statements check to see if a certain condition is met and then executes blocks of code according to the answer.

For example, the code below checks to see if x is greater than 2. If `x > 2` is True, the block to print Hello will run. Otherwise, Goodbye will be printed.

```
if x > 2:
    print("Hello")
else:
    print("Goodbye")
```

You can have check multiple conditions at once:

```
if x > 2:
    print("Hello")
elif x == 2:
    print("Hola")
else:
    print("Goodbye")
```

Note the indentations for each block. The indented blocks go with the statements above them and only run if those statements are True. **Be careful with indentations - incorrect indentations can cause unexpected behavior!**