Logical Operators

Comparing pairs of TRUE and FALSE

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Logical Operators

- And **&&**
- Or **||**
- Exclusive Or (XOR) **^**
- Not **!**

Logical Operators

- What are they used for?
  - They compare two TRUE or FALSE values.
  - They compare pairs of relational expressions.
  - The comparison results in TRUE or FALSE.

And Operator

- Represented by the symbol &&
- Requires both in the pair to be TRUE for the whole pair to be TRUE
- (a == b && b < c)

Comparing Values

- Truth Table for **&&**

TRUE && TRUE	TRUE
TRUE && FALSE	FALSE
FALSE && TRUE	FALSE
FALSE && FALSE	FALSE

OR Operator

- Represented by the symbol ||
- Requires at least ONE of the pair to be TRUE for the whole pair to be TRUE
- (a == b || b < c)

Comparing Values

- Truth Table for ||

TRUE || TRUE	TRUE
TRUE || FALSE	TRUE
FALSE || TRUE	TRUE
FALSE || FALSE	FALSE

XOR Operator

- Represented by the symbol ^
- Also called "Exclusive Or"
- Requires ONLY ONE of the pair to be TRUE for the whole pair to be TRUE
- If more than one are true, the result is FALSE.

Comparing Values

- Truth Table for ^

TRUE ^ TRUE	FALSE
TRUE ^ FALSE	TRUE
FALSE ^ TRUE	TRUE
FALSE ^ FALSE	FALSE

Not Operator

- Represented by the symbol !
- Flips a value
  - TRUE becomes FALSE
  - FALSE becomes TRUE
- Is not used for comparison
- If more than one are true, the result is FALSE.

Not Operator

- Not operator negates.
- Turns TRUE to FALSE and vice versa

a!=b the same as !(a===b)

a<b the same as !(a<b)

Multiple Conditions

- When dealing with more complex conditions, you can use parenthesis to group your logic.
  - `if( a == b || ( b == c && c == 5))`

Common Misconceptions

Stuff to watch out for, Stuff to remember

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Common Misconceptions

- How do we see if a, b and c all have the same value?

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```
a === b === c
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TRUE

Common Misconceptions

- How do we see if a, b and c all have the same value?

~~a === b === c~~

```
a === b && b === c
```

Things to Remember

- Relational Operators go in between PAIRS of objects.
- Logical Operators go in between Relational Expressions or Boolean values.
- Always work in pairs.