



CS 149

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Boolean Expressions

- The primitive data type ***boolean*** has two values: **true** and **false**. Boolean expressions are built using ***relational operators*** and ***conditional operators***.



Relational Operators

Relational operator – compare two values, evaluate to true or false

Relational Operator	Meaning
>	is greater than
<	is less than
>=	is greater than or equal to
<=	is less than or equal to
==	is equal to
!=	is not equal to



Boolean Expressions

- An expression that evaluates to true or false

Examples:

- $X < 7$
- $A == B$
- $3 \neq 4$

Model 1 Relational Ops

Interactions	Value displayed	Relational operator
<code>int three = 3</code>	none	none
<code>int four = 4</code>	none	none
<code>System.out.println(four)</code>	4	none
<code>three > four</code>	false	>
<code>boolean isLarger = three > four</code>		
<code>System.out.println(isLarger)</code>		
<code>three == four</code>		
<code>three < four</code>		
<code>three <= four</code>		
<code>three = four</code>		
<code>three == four</code>		

- 1) Examine the fifth line of Java code in the above model.
 - a) What three actions are performed in this single line of code?
 - b) Write two lines of code, ending with semicolons, that would perform these same actions (but in two lines instead of a single line).
- 2) List the four unique boolean expressions used in the model.

Relational Ops contd.

Interactions	Value displayed	Relational operator
<code>int three = 3</code>	none	none
<code>int four = 4</code>	none	none
<code>System.out.println(four)</code>	4	none
<code>three > four</code>	false	>
<code>boolean isLarger = three > four</code>		
<code>System.out.println(isLarger)</code>		
<code>three == four</code>		
<code>three < four</code>		
<code>three <= four</code>		
<code>three = four</code>		
<code>three == four</code>		

3. The `!=` operator means “not equals”. Give an example of a boolean expression that uses `!=` and evaluates to false.
4. Explain why the same boolean expression `three == four` resulted with two different boolean values in this Model.
5. What is the difference between `=` and `==` in Java?
6. List the six relational operators that can be used in a boolean expression. (Five have been used so far, but you should be able to guess the sixth.) Explain briefly what each one means.

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