## COMP I 10/L Lecture 9

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## Outline

- @Test vs.assertEquals
- Boolean operations
  - & &
  - | |
  - !
- Complex if conditions

## @Test vs. assertEquals

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- @Test defines a test
- assertEquals checks a condition
- Can have a @Test containing no assertEquals
  - Test always passes
- Can have multiple assertEquals per @Test
  - Test passes if all assertEquals are ok

-Generally we want to define one assertEquals per @Test, but sometimes this is inconvenient

## **Example:** MultiAssert.java MultiAssertTest.java

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#### 3 < 6

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true

Can chain boolean expressions with AND (&&). Semantics: only true if both sides are true.

### 3 > 1 && 1 < 5 true

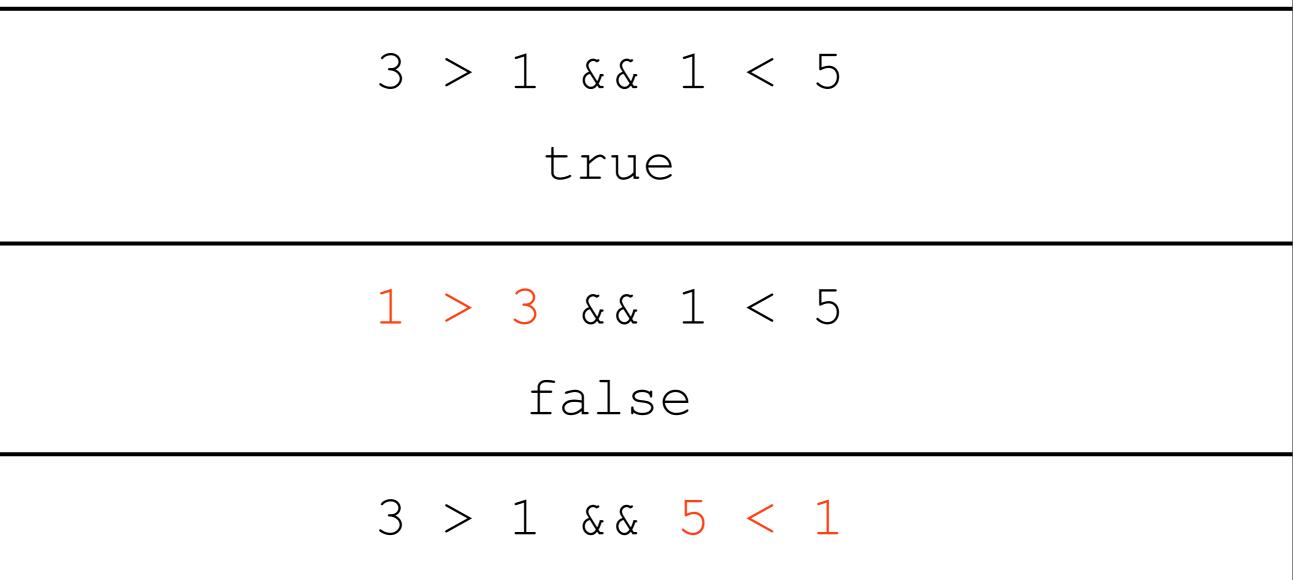
#### 1 > 3 & 1 < 5

Can chain boolean expressions with AND (&&). Semantics: only true if both sides are true.

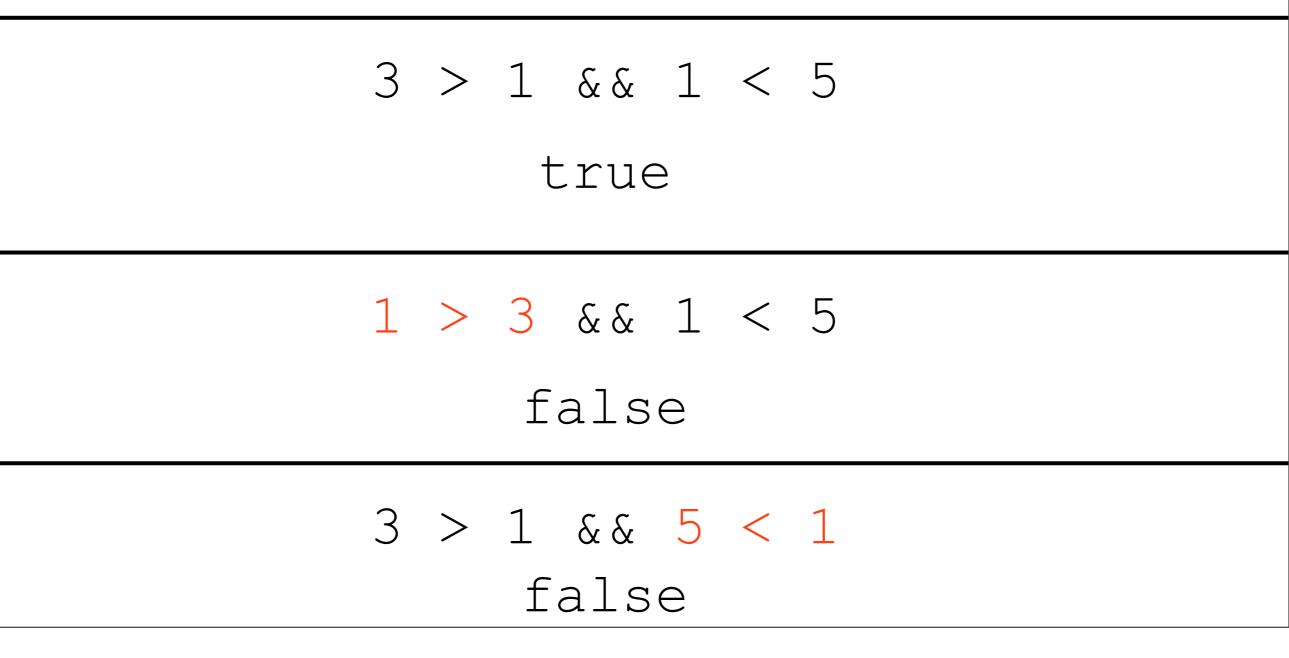
### 3 > 1 && 1 < 5 true

1 > 3 && 1 < 5 false

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## Example: And.java

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#### 3 > 1 || 5 < 1 true

#### 2 < 1 || 8 < 9

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boolean expressions can also be combined with OR (||) Semantics: true if either side is true.

#### 3 > 1 || 5 < 1 true

#### 2 < 1 || 8 < 9 true

#### 2 < 1 || 9 < 8 false

**Example:** Or.java

Can negate a boolean expression with not (!).
Semantics: !true == false and !false == true.

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#### ! (1 < 2)

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!(1 < 2) false

! (1 > 7)

Can negate a boolean expression with not (!).

Semantics: !true == false and !false == true.

!(1 < 2) false

! (1 > 7)

true

Can negate a boolean expression with not (!).

Semantics: !true == false and !false == true.

!(1 < 2) false

true

$$! (1 < 2 \& \& 1 > 3)$$

Can negate a boolean expression with not (!).
Semantics: !true == false and !false == true.

!(1 < 2) false

true

#### !(1 < 2 && 1 > 3) true

## Example: Not.java

### Putting it Together: ComplexConditional.java

Uses of & & and | | usually mean more tests are appropriate

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- if (x == 1 || x == 5) { return 7;
- } else if (x > 7 && x <= 20) {
   return 8;</pre>
- } else {
   return 55;

}

Uses of & & and | | usually mean

more tests are appropriate

Test: x = 1

- if (x == 1 || x == 5) {
  return 7;
- } else if (x > 7 && x <= 20) {
   return 8;</pre>
- } else {
   return 55;

}

Uses of && and || usually mean

more tests are appropriate

Test: x = 1 Test: x = 5

- if (x == 1 | | x == 5) {

return 7;

- } else if (x > 7 && x <= 20) { return 8;
- } else { return 55;

}

Uses of && and || usually mean

more tests are appropriate

Test: x = 1 Test: x = 5
if (x == 1 || x == 5) {
 return 7; Test: x = 8
} else if (x > 7 && x <= 20) {
 return 8;
} else {
 return 55;
}</pre>

Uses of & & and | | usually mean

more tests are appropriate

Test: x = 1 Test: x = 5
if (x == 1 || x == 5) {
 return 7; Test: x = 8
} else if (x > 7 && x <= 20) {
 return 8;
} else {
 return 55; Test: x = 21
}</pre>

Putting it Together: ComplexConditionalTest.java