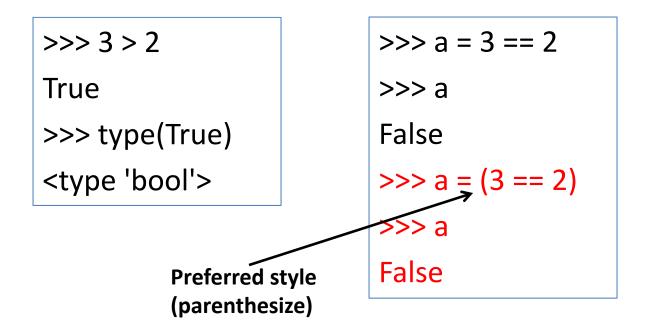
# Boolean Expressions and Logical Operators

CSE 1310 – Introduction to Computers and Programming
Vassilis Athitsos
University of Texas at Arlington

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#### The Boolean Type

- Expressions of type boolean can only have two values: True, or False.
  - True and False are reserved keywords in Python.



### **Comparisons Generating Booleans**

 The following operators comparing numerical values generate boolean results:

```
== equality
```

!= not equal

< less than

> greater than

<= less than or equal to</pre>

>= greater than or equal to

### **Logical Operators**

 The following logical operators can be used to produce boolean results:

not

and

or

### **Using Logical Operators**

```
>>> a = 3
>>> (a == b) or (a+b == 7)
True
>>> (a == b) and (a+b == 7)
False
>>> not(a == b)
True
```

### Combining operators

What does this line do?

$$>>> (3 == 5)$$
 and  $(2 < 3)$  or  $(3 >= 0)$ 

## Combining operators

What does this line do?

$$>>> (3 == 5)$$
 and  $(2 < 3)$  or  $(3 >= 0)$ 

- I don't know, and I don't want to know.
  - Use parentheses to make the meaning of these statements clear.

>>> 
$$((3 == 5) \text{ and } (2 < 3)) \text{ or } (3 >= 0) \rightarrow \text{True}$$

>>> 
$$(3 == 5)$$
 and  $((2 < 3))$  or  $(3 >= 0))  $\rightarrow$  False$