

CSC108H Lecture 4

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Relational Operators

- ▶ Remember: `=` is the Python assignment operator
 - ▶ It is a command to evaluate the right-hand side and make the variable on the left refer to that result
 - ▶ In math (not Python!), `=` is a claim that two expressions are equal
- ▶ `==` is the Python operator that tests for equality
 - ▶ Other relational operators: `>` `>=` `<` `<=` `!=` (the last one means “not equal”)
 - ▶ They return `bool` (Boolean) values

ConcepTest

What is the output of the following code?

```
a = 3  
b = (a != 3)  
print(b)
```

- ▶ A. True
- ▶ B. False
- ▶ C. 3
- ▶ D. Syntax error

ConcepTest

What is the output of the following code?

```
a = 3  
b = (a == 3)  
print(b)
```

- ▶ A. True
- ▶ B. False
- ▶ C. 3
- ▶ D. Syntax error

Logical Operators

- ▶ The logical operators take one (not) or two (and, or) bools and return a bool
- ▶ An expression involving not produces True if the original value is False, and False if the original value is True
- ▶ And produces True exactly when both of its operands are True
- ▶ or produces True exactly when at least one of its operands is True

ConcepTest

I would like an expression that evaluates to True exactly when at least one of the following two conditions is true: (1) a and b are equal, (2) when a has value 5. Which of these expressions does that?

- ▶ A. `a == b == 5`
- ▶ B. `a == b or a == 5`
- ▶ C. `a == b and a == 5`
- ▶ D. `a == (b == 5)`

ConcepTest

What is the value of the expression at the bottom of the code?
(Remember that not has the highest precedence, then and, then or.)

```
a = True  
b = False  
c = True  
not a and b or c
```

- ▶ A. True
- ▶ B. False

Mod Operator

- ▶ % in Python is the mod (modulus) or remainder operator
- ▶ It returns the remainder after carrying out an integer division
- ▶ There is an important relationship between integer division and mod
- ▶ Let's call q the result of $a // b$ and r the result of $a \% b$
- ▶ Then, $a == q * b + r$

ConcepTest

Assume that a refers to a three-digit integer. Which of the following evaluates to the middle digit of a ? (For example, if a referred to value 456, we want an expression with value 5.)

- ▶ A. $(a // 10) \% 10$
- ▶ B. $(a \% 100) // 10$
- ▶ C. $(a \% 10) // 10$
- ▶ D. More than one of the above
- ▶ E. None of the above