Objectives

- Even more conditionals!
- Text process, manipulation
 - > String operations, processing, methods

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Review

- How do you tell Python to make decisions in code?
 - ➤ What are the different ways to express these decisions?

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More Complex Conditions

- Boolean
 - > Two logical values: True and False
- Combine conditions with Boolean operators
 - > and True only if both operands are True
 - >or True if at least one operand is True
 - > not True if the operand is not True
- English examples
 - > If it is raining and it is cold
 - ➤ If it is Saturday **or** it is Sunday
 - ➤ If the shirt is on sale **or** the shirt is purple

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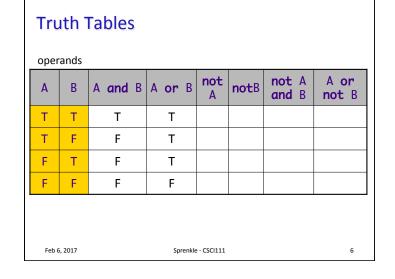
```
What is the output?
```

```
Focus: how operations work
x = 2
                             Not good variable names
v = 3
z = 4
  = x = 2
c = not b
  = (y<4) and (z<3)
                              Because of precedence,
print("d=",d)
                              we don't need parentheses
d = (y<4) \text{ or } (z<3)
print("d=",d)
d = not d
print(b, c, d)
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                                   eval_cond.py
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```

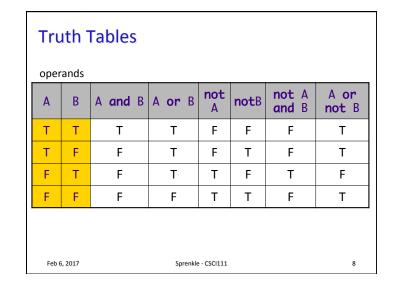
Truth Tables operands A B A and B A or B A B and B not B and B not B and B not B and B a

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Truth Tables operands not A A or not A and B A or B notB and B not B Τ Т F F F Τ F Т Т F F Τ Т F Т Т Feb 6, 2017 Sprenkle - CSCI111



Problem

- We are grading a science fair.
- There is different criteria for winning first place, depending on what grade you are.
- Given the variables scienceScore and grade
 - ➤ Write a condition that will evaluate to True if (and only if) the student's score is above the first place threshold of 60 points and the student's grade is 8.
 - Otherwise, the condition should evaluate to False

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Problem

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scienceScore > 60 and grade == 8

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Practice: Numeric Grade Input Range

- Enforce that user must input a numeric grade between 0 and 100
 - ➤ In Python, we can't (always) write a condition like 0 <= num_grade <= 100, so we need to break it into two conditions
- Write an appropriate condition for this check on the numeric grade
 - ➤ Using **and**
 - ➤ Using or

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Practice: Numeric Grade Input Range

 Enforce that user must input a numeric grade between 0 and 100

➤ Using **or**

if num_grade < 0 or num_grade > 100:
 print error message
else:

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computation

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Short-circuit Evaluation

- Don't necessarily need to evaluate all expressions in a compound expression
- A and B
 - ➤ If A is False, compound expression is False
- A or B
 - ➤ If A is True, compound expression is True
- No need to evaluate B
 - ➤ Put more important/limiting expression first
 - Figure 2: Example: if count != 0 and sum/count > 10:

 do something

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Motivation: Text Processing

- Mostly focused on numbers so far
 - ➤ A little on graphics
- We can manipulate strings to do useful work
 - ➤ Web search: finding most relevant documents to a query
 - > Analyzing web logs (who is looking at my web page?)
 - ➤ Many, many others
- Today's Focus: the Str data type and what you can do with them

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TEXT PROCESSING

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Strings: str

- Used for text
- Indicated by double quotes "" or single quotes "
 - ➤ In general, I'll use double quotes
 - ➤ Empty string: "" or "
- Use triple quotes """ for strings that go across multiple lines

```
"""This string
is long.
Like, really, really long"""
```

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STRING OPERATIONS

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String Operations

Operand	Syntax		Meaning
+	str1 +	str2	Concatenate two strings into one string
*	str *	* num	Concatenate string num times

• Examples:

```
> "I feel " + "sleepy"
• Evaluates to "I feel sleepy"
```

> "Oops! " * 3

• Evaluates to "Oops! Oops! "

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Recall lab 0

More Motivating Constants

- I have a survey program that asks people to rate something on a scale of 1 to 10
- It asks people to rate 100 different things
- I could create the prompt

```
"Rank " + thing + " on a scale of 1 to 10"
```

- But what if my scale changes, and I want it to be on a scale of 1 to 100?
 - ➤ I want to make sure the ranking is within my range

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Practice

• Given the following code

```
SCALE_MIN = 1
SCALE_MAX = 10
prompt = ...
rating = eval(input( prompt ))
```

• Create the **str** variable prompt for the input statement so that it prompts the user:

On a scale of 1 to 10, how much do you like Matt Damon?

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survey.py

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String Comparisons

• Same operations as with numbers:

```
> ==, !=
> <, <=
> >, >=

Alphabetical comparison
```

• Use in conditions in **if** statements

```
if courseChoice == "CSCI111":
    print("Good choice!")
else:
    print("Maybe next semester")
```

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Looking Ahead

- Lab tomorrow
- Exam Friday
 - > Preparation document on line
 - ➤ Content: up through Conditionals

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