Python
Alternative Statements
More on Conditions

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Conditions

- A condition is an expression that evaluates to True or False
- This type is called Boolean
Boolean Expressions

- The simplest Boolean expressions are True and False
- The next simplest class are numerical comparators
  - <  smaller
  - >  greater
  - == equals (Two! equal symbols)
  - != not equals
  - <= smaller or equal
  - >= larger or equal
Boolean Expressions

• We can combine Boolean expressions using the logical operands
  • and
  • or
  • not
• If necessary, we can add parentheses in order to specify precedence
Boolean Expression Examples

- A program that decides whether user input is divisible by 2, but not by 3.

```python
x = int(input("Please enter a number: "))
if x%2==0 and not x%3==0:
    print("The number is divisible by two, but not by three")
else:
    print("The number is not divisible by two or it is divisible by three.")
```
Boolean Expression Example

- A program that checks whether the letter “a”, “A”, “e” or “E” is part of user input.
- Python allows the keyword “in” to check for the presence of letters in strings.

```python
user_input = input("Please enter a string: ")
if 'a' in user_input or 'A' in user_input or "e" in user_input or "E" in user_input:
    print("present")
else:
    print("not present")
```
Short-Circuit Operators

- The value of an “or”- or “and” expression is evaluated from the left to the right
  - If the first operand of an “or” is True, then the second operand is not evaluated and True is returned.
  - This is because the value of the expression is already known
  - Similarly, if the first operand of an “and” expression is False, then the second operand is not evaluated and the value of the expression is False.
Conversion of other expressions

• Any object can be tested for a truth value.

• The truth value of a non-zero number is True, otherwise False.
  
  • Example:
  
  ```python
  >>> if 5%2:
      print("5 is odd")
  
  5 is odd
  
  Since 5%2 evaluates to 1, it’s truth value is True and the conditional statement (print(...)) is executed
  
  • This behavior extends to other type of objects such as strings
  
  • The empty string "" has truth value 0, every other string has truth value 1.