

CSC108H Lecture 7

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September 24, 2012

If and If-Else

To do something if a condition is true and nothing if the condition is false:

```
if <condition>:  
    <sequence of statements>
```

To do something if a condition is true and something else if that condition is false:

```
if <condition>:  
    <sequence of statements-1>  
else:  
    <sequence-of-statements2>
```

ConceptTest

What is the value of x after this code runs?

```
x = 5
if x > 2:
    x = -3
    x = 1
else:
    x = 3
    x = 2
```

- ▶ A. -3
- ▶ B. 1
- ▶ C. 2
- ▶ D. 3
- ▶ E. 5

ConceptTest

What is the value of x after this code runs?

```
x = 1
if x > 2:
    x = -3
    x = 1
else:
    x = 3
    x = 2
```

- ▶ A. -3
- ▶ B. 1
- ▶ C. 2
- ▶ D. 3
- ▶ E. 5

Multi-Way Ifs

```
if <condition-1>:  
    <sequence of statements-1>  
elif <condition-2>:  
    <sequence-of-statements2>  
elif ...  
    ...  
else:  
    <sequence-of-statements-n>
```

- ▶ Think of this whole thing as one big statement
- ▶ Python evaluates the conditions from top to bottom
- ▶ When it finds a condition that is true, it executes the corresponding indented statements and continues **after** this code
- ▶ The `else` is optional
 - ▶ If it's there, it executes if all conditions above are false

ConceptTest

```
if temperature > 0:  
    print("above freezing")  
elif temperature == 0:  
    print("at freezing")  
else:  
    print("below freezing")
```

Does the code below do exactly the same thing as the code above?
(Assume temperature already refers to some numeric value.)

```
if temperature > 0:  
    print("above freezing")  
elif temperature == 0:  
    print("at freezing")  
elif temperature < 0:  
    print("below freezing")
```

- ▶ A. Yes
- ▶ B. No

ConcepTest

```
if temperature > 0:  
    print("above freezing")  
elif temperature == 0:  
    print("at freezing")  
else:  
    print("below freezing")
```

Does the code below do exactly the same thing as the code above?

```
if temperature > 0:  
    print("above freezing")  
elif temperature == 0:  
    print("at freezing")  
print("below freezing")
```

- ▶ A. Yes
- ▶ B. No

ConceptTest

```
if temperature > 0:  
    print("above freezing")  
elif temperature == 0:  
    print("at freezing")  
else:  
    print("below freezing")
```

Does the code below do exactly the same thing as the code above?

```
if temperature == 0:  
    print("at freezing")  
elif temperature <= 0:  
    print("below freezing")  
else:  
    print("above freezing")
```

- ▶ A. Yes
- ▶ B. No

ConcepTest

```
x = 5
if x < 15:
    if x > 8:
        print('one')
    else:
        print('two')
else:
    print('three')
```

What is the output?

- ▶ A. one
- ▶ B. two
- ▶ C. three
- ▶ D. More than one of the above
- ▶ E. No output

Example: Nested Ifs

```
s = input("Enter PH value: ")
if len(s) > 0:
    ph = float(s)
    if ph < 7.0:
        print(ph, "is acidic.")
    elif ph > 7.0:
        print(ph, "is basic.")
    else:
        print(ph, "is neutral.")
else:
    print("No pH value was given!")
```