

CSC 280 Introduction to Computer Science:  
Programming with Python

Lecture 3 : Conditionals, Reviews & Exercises

Prof. Bei Xiao

Fall, 2014

American University

# Review 1: number, string, assignment

data types: numbers, strings

variables and assignment

`<var> = value`

```
name = raw_input("What is your name? ")
```

# Review 1: indentation

IDLE Automatic indentation:

tab indents forward 4 spaces

Backspace/delete indents backward 4 spaces

# Exercise: user input

We will ask the user for his/her first and last name, and date of birth, and print them out formatted. Recall that you can get input from the user using the command `name = raw_input('text')`, as shown in lecture

# Exercise: user input

Example:

Enter your first name: Chuck

Enter your last name: Norris

Enter your date of birth:

Month? March

Day? 10

Year? 1940

Chuck Norris was born on March 10, 1940.

Hint: how to print comma? print mo, day+',', year.

# Good naming practices

- script name: lowercase `userinput.py`, `exercise1.py`.
- variable name:  
capitalizing `TheBeginningOfWordsInVariable`  
Names, first letter should be lower case. E.g.  
`firstName = 'John'`

# Review 2: Conditionals

- What is the difference between straight line programming and branching programming?
- What composes a conditional?
- In this lecture, we will further our understanding of conditionals.

# Conditionals

if < condition is true>:

do something

elif <condition is true>:

do something else

else:

do the rest



# Conditional Operators

- 1.  $>$  (Greater than)
- 2.  $>=$  (Greater than or equal to)
- 3.  $<$  (Less than)
- 4.  $<=$  (Less than or equal to)
- 5.  $==$  (Equal to)
- 6.  $!=$  (Not equal to)

# Logical Operators

- An and statement evaluates to True when both a and b are True.
- An or statement evaluates to True if either a or b is True.
- A not statement evaluates to the opposite value of the variable it modifies.

# Demos: Traffic light

- Prompt to ask for the color of the traffic light,  
if it is red, print “you should stop”  
if it is green, print “ go ahead”  
if it is yellow, print “ Slow down!”  
if none of above, print a question.

Hint: to convert everything to lower case, use `str.lower()`. e.g.:

```
light_color = light_color.lower()
```

# Example: find smallest number

- Find the smallest number of three numbers.
- Algorithm 1: compare two numbers, get out the bigger one, then compare the smaller one to the third
  1. compare  $x$  and  $y$ , if  $x < y$ , go to step 2, otherwise, go to step 3.
  2. compare  $x$  and  $z$ , if  $x < z$ ,  $x$  is the least, otherwise,  $z$  is the least.
  3. compare  $y$  and  $z$ , if  $y < z$ ,  $y$  is the least, otherwise,  $z$  is the least.

# Alternative solution

- Find the smallest number of three numbers.
- Algorithm 2: pick the biggest one first, then compare the rest
  1. compare  $x$  with  $y$  and  $z$ , if  $x$  is smaller than both  $y$  and  $z$ ,  $x$  is the smallest
  2. if the above statement is not true ( $x$  must not be the least), compare  $y$  and  $z$ , if  $y$  is smaller,  $y$  is the least.
  3. Otherwise,  $z$  is the least.

# Exercises

- Prompt (using `raw_input`) to ask how many course credits a student have, if she/he has received more than 120 credits, print out the credit and tell them that they can graduate, if not, tell them how many credits they still need to graduate.
- Hint: type conversion

# Take-home exercises

- Ask the user to input their names, if it is your name, tell them that is a nice name, if it is one of the stored name: Albert Einstein, George W Bush, Peter Pan, tell them what you feel about them, if it is not one of the stored names, tell them they have a nice name. Use `raw_input` and `elif`

# Exercise: Dream Job

The purpose of this exercise is to understand conditionals. Tiberius is looking for his dream job, but has some restrictions. He loves California and would take a job there if it paid over 40,000 a year. He hates Massachusetts and demands at least 100,000 to work there. Any other place he's content to work for 60,000 a year, unless he can work in space in which case he would work for free. The following code shows his basic strategy for evaluating a job offer.



# Exercise: dream job

```
pay = _____  
location = _____  
if location == "U.S.S. Enterprise":  
    print "So long, suckers! I'll take it!"  
elif location == "Massachusetts":  
    if pay < 100000:  
        print "No way"  
    else:  
        print "I'll take it!"  
elif location == "California" and pay > 40000:  
    print "I'll take it!"  
elif pay > 60000:  
    print "I'll take it!"  
else:  
    print "No thanks, I can find something better."
```

# decision

1. location = "Massachusetts"

pay = 50000

No way

2. location = "Iowa"

pay = 50000

No thanks

3. location = "California"

pay = 50000

I 'll take it

4. location = "U.S.S. Enterprise"

pay = 1

No, Thanks

5. location = "California"

pay = 25000

No Thanks.

# Quiz: Types

Python automatically infers the type from the value you assign to the variable. Write down the type of the values stored in each of the variables below. Pay special attention to punctuation: values are not always the type they seem!

1. `a = False`
2. `b = 3.7`
3. `c = 'Alex'`
4. `d = 7`
5. `e = 'True'`
6. `f = 17`
7. `g = '17'`
8. `h = True`
9. `i = '3.14.159'`

# Further reading

- Chapter 4 Conditionals

- Using IDLE

<https://docs.python.org/2/library/idle.html>

- Myths about indentation:

[http://www.secnetix.de/olli/Python/  
block\\_indentation.ha](http://www.secnetix.de/olli/Python/block_indentation.ha)