

INTRODUCTION TO



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Information about myself

- ❖ Hometown Chambersburg, PA
- ❖ B.S. Dairy & Animal Science from Penn State
- ❖ A.A.S. Computer Sci. & Info. Tech. Pellissippi

Python and programming in general

- ❖ Python conceived by Guido van Rossum in the late 1980's



- ❖ Enhanced readability & user Friendly

- ❖ Python is a high-level language

```
011011010110111101110000
```

```
print "mop"
```

- ❖ Interpreter or compiler

- ❖ Includes many different libraries

Python in Chinese

回答 = 读入('你认为中文程式语言有存在价值吗？
(有/没有)')

如 回答 == '有': 写 '好吧, 让我们一起努力!'

不然 回答 == '没有':

写 '好吧, 中文并没有作为程式语言的价值.'

否则: 写 '请认真考虑后再回答!'

Source: Stephanie Poole

Variables & Data Types

- ❖ Variables
- ❖ Integer
- ❖ Floating point
- ❖ Character
- ❖ String
- ❖ List

Variables

- ❖ Variables are used to store data and computational results in the program.

```
name = "Bobby"
```

```
sum = 10 + 2
```

```
myList = [34, "Dog", 15, "U"]
```

Integer Data Type

- ❖ Integer data type is a whole number and contains no decimals or fractions.

$$x = 40$$

$$y = 10$$

$$z = 2$$

Floating Point Data Type

- ❖ Floating point is used to handle numbers with fractional parts.

$$x = 40.12$$

$$y = .25$$

$$z = 2.0$$

Character Data Type

- ❖ Characters consist of letters, numerical digits and common punctuation marks.

A
a
1
2
-
"
#
Z

String Data Type

- ❖ A String is just multiple characters “glued” together.

H	e	l	l	o		W	o	r	l	d
0	1	2	3	4	5	6	7	8	9	10

List Data Type

- ❖ List (or arrays which is similar) is a sequence of items where the entire sequence is referred to by a single name and individual items can be selected by indexing.

```
myList = [34, "Dog", 15, "U"]
```

```
myList[2]
```

```
15
```

```
myList[2] = 0
```

```
myList
```

```
[34, "Dog", 0, "U"]
```

Input Statements

- ❖ In order for the computer to get information from the user we need away for them to input that information.
- ❖ `input()`
- ❖ `raw_input()`

“input()” Statement

- ❖ Treats whatever the user types as an expression to be evaluated.

```
num = input (“Enter whole number: “)
```

```
Enter whole number: 40
```

```
name = input (“What is your first name: “)
```

```
What is your first name: “Terry”
```

“raw_input()” Statement

- ❖ The user input is simply handed to the program as a string of text.

```
num = raw_input (“Enter whole number: “)
```

```
Enter whole number: 40
```

```
name = raw_input (“What is your first name: “)
```

```
What is your first name: Terry
```

Beyond Snippets of Code

- ❖ Up to now we have been running snippets of code but we want to be able to execute an entire sequence of statements.
- ❖ Python allows us to do this through the function command.

```
Def hello(person):  
    print "Hello", person  
    print "Computers are fun!"
```

Celsius to Fahrenheit Module

Type `nano convert.py`
(this will open the editor and name the file)

```
#!/usr/bin/python
```

```
# A program to convert Celsius temps to Fahrenheit
```

```
def main() :
```

```
    celsius = input("What is the Celsius Temperature? ")
```

```
    fahrenheit = 9.0 / 5.0 * celsius + 32
```

```
    print "The temperature is" , fahrenheit, "degrees fahrenheit."
```

```
main()
```

Press control + O to save and control + X to exit

Type: `python convert.py`

Decision Structures

- ❖ Statements that allow the program to “choose” an appropriate course of action.

- ❖ if

- ❖ else

- ❖ elif

“if” Statement

- ❖ The “if” statement is used for conditional situations.

```
#!/usr/bin/python
# A program to convert Celsius temps to Fahrenheit
def main() :
    celsius = input("What is the Celsius Temperature? ")
    fahrenheit = 9.0 / 5.0 * celsius + 32
    print "The temperature is" , fahrenheit, "degrees fahrenheit."
    if fahrenheit > 90 :
        print "IT's really hot out there, be careful!"
main()
```

“elif” Statement

- ❖ The “elif” statement acts to modify the “if” statement.

```
#!/usr/bin/python
# A program to convert Celsius temps to Fahrenheit
def main() :
    celsius = input("What is the Celsius Temperature? ")
    fahrenheit = 9.0 / 5.0 * celsius + 32
    print "The temperature is" , fahrenheit, "degrees fahrenheit."
    if fahrenheit > 90 :
        print "IT's really hot out there, be careful!"
    elif fahrenheit < 30 :
        print "Brrrrr. Be sure to dress warmly!"
main()
```

“else” Statement

- ❖ If the “if” or “if and elif” statement is false then the “else” statement can be used to...

```
#!/usr/bin/python
# A program to convert Celsius temps to Fahrenheit
def main() :
    celsius = input("What is the Celsius Temperature? ")
    fahrenheit = 9.0 / 5.0 * celsius + 32
    print "The temperature is" , fahrenheit, "degrees fahrenheit."
    if fahrenheit > 90 :
        print "IT's really hot out there, be careful!"
    elif fahrenheit < 30 :
        print "Brrrrr. Be sure to dress warmly!"
    else:
        x = 325
main()
```

Loops

- ❖ for

 - non-conditional loop

 - for <var> in <sequence> :
<body>

- ❖ while

 - conditional loop

 - while <condition> :
<body>

“for” Loop Example



```
for i in [1, 2, 3, 4]:  
    print i, "ORNL"
```

Output:

```
1 ORNL  
2 ORNL  
3 ORNL  
4 ORNL
```

“while” Loop Example

```
x = 0
while x != 3 :
    print x, “We love?!”
    print “ Python!!”
    x += 1
```

Output:

```
0 We love?!
  Python!!
1 We love?!
  Python!!
2 We love?!
  Python!!
```

Putting It All Together

```
#!/usr/bin/python
import string
def main():
    name = raw_input("Type your first name in lowercase: ") + ","
    print
    print "Hello",string.upper(name),"you just used raw_input, print,
        and string library."
Main()
```

Add More Code

```
words = "hay hot green White"  
new = ""  
for i in [14, 1, 2, 3, 6, 5, 7, 8, 5]:  
    run = words[i]  
    new += run  
print  
print new,string.capitalize(name),"you just indexed  
    through a sting using for-loop."
```

Even More Code

```
count = 0
sum = 0.0
moredata = "yes"
while moredata[0] == "y":
    print "\nLets average numbers.\n"
    x = input("Enter a number: ")
    sum = sum + x
    count += 1
    moredata = raw_input("Do you have more numbers (yes or
                          no)? ")
print
print string.capitalize(name), "\n\nThe average of the numbers is"
    , sum / count
```

Last Bit of Code Promise

```
quest = raw_input("\nDo you want to learn more about
                  Python (yes or no)? ")
if quest[0] == 'y':
    print
    print string.capitalize(name),"go to www.python.org
    and enjoy the rest of the day."
else:
    print "\nThanks for listening",string.capitalize(name[:-1]),
    "and have a great day."
```