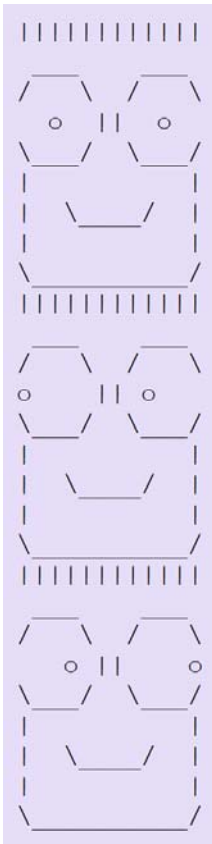


CompSci 101

Introduction to Computer Science



Sept. 7, 2017

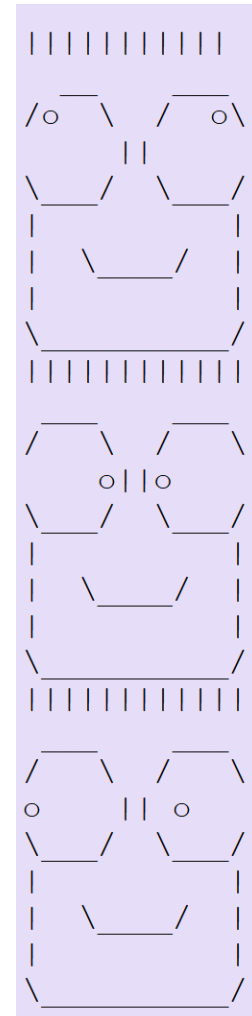
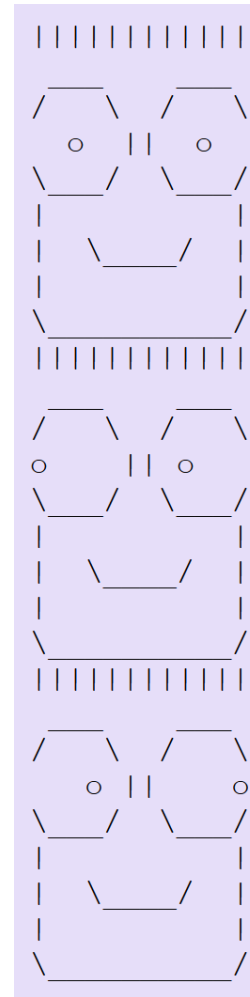
Prof. Rodger

Announcements

- Reading and RQ 4 due next time
- Asgn 2 out, APT 1 is due Tuesday
- Add class/change sections? – see forms tab on www.cs.duke.edu/courses/compsci101/fall17
- Today - FTIS
 - functions, parameters
 - Names, types and values

Assignment 2 out

- Totem poles
 - printing heads
 - Functions
- Note: You have different requirements



REVIEW: Solving APT BMI

- Write your code in Eclipse
 - Create python file - **with Module:Main**
 - Name of file important – case matters
 - name of function important – cut and paste this
 - Write your code
 - Test a few examples in Eclipse
- Run online on using APT Tester
 - Test on examples, Debug, fix, get all **GREEN**
- Submit on APT page
 - must run again, then check score
 - Fill out REFLECT form too

Organization matters

- <https://www.youtube.com/watch?v=1ve57l3c19g>



APT organization, Code organization

- You've written the BMI.py APT
 - Where is that module? How do you test it?
 - PyDev console, but then must import it
 - Adding print statements in BMI.py to test
- Putting sentences together in order...
 - “Once upon a time...” “It was the best of times...” “Aujord’hui ma maman est morte”
- Putting code together in order
 - Takes judgment and experience

Running and Understanding Code

- Need Python compiler/interpreter
 - We're using Canopy, includes libraries
- Need an editor development environment
 - We use Eclipse and PyDev, open source and widely used, Ambient is Duke Plugin
- You need experience thinking and coding and debugging ideas and code:
 - Installing the suite of tools can be cumbersome
 - Persist, Perservere, Get Help, start over ☹

Understanding terminology: code

- Move from "Hello World" to "Hello Around the World"
 - Look at Python, code, libraries
 - Learning (reviewing) terminology about Python

```
print "hello world"
```

```
f = open("hello.txt")  
for line in f:  
    print line
```


Hello around world code

<http://bit.ly/101f17-0907-1>

Hello from the web

bit.ly/101f17-0907-2

```
import urllib2  
  
if __name__ == '__main__':  
    url = "http://www.cs.duke.edu/courses/compsci101/fall17/data/hello.txt"  
    f = urllib2.urlopen(url)  
    for line in f:  
        print line
```

Hello from the Web in Python

- We open a file, and we open a URL
 - Syntax slightly different, concept is similar
 - Real-world differences between files and URLs?

```
f = open("hello.txt")
```

- Must adhere to syntactic rules of Python
 - Naming, whitespace, : or . or (or) or [or]
- Must adhere to semantic rules of Python
 - Can't loop over anything, more rules to follow 11

Hello from the Web in Python

- We open a file, and we open a URL
 - Syntax slightly different, concept is similar
 - Real-world differences between files and URLs?

```
f = open("hello.txt")
```

```
f = urllib2.urlopen("http://nytimes.com")
```

- Must adhere to syntactic rules of Python
 - Naming, whitespace, : or . or (or) or [or]
- Must adhere to semantic rules of Python
 - Can't loop over anything, more rules to follow ¹²

Functions return values

- Most functions return values
 - Sometimes used to make things simpler, but returning values is a good idea

```
def inch2centi(inches):  
    answer = 2.54*inches  
    return answer
```

```
xh = inch2centi(72)
```

```
def pluralize(word):  
    return word + "es"
```

```
pf = pluralize("fish")
```

Functions can print info

- Some functions only print info
- Note there is no return statement in the function

```
def helloPerson(name):  
    print "hello" + name  
  
helloPerson("Susan")  
helloPerson("Ademola")
```

Simple Python Functions

<http://bit.ly/101f17-0907-3>

- Answer these questions based on thinking, don't run any code
- Why do we need functions?
 - Manage complexity of large programs
 - Test and develop code independently
 - Reuse code in new contexts: create APIs!

Function – return or print?

bit.ly/101f17-0907-4

- Example function that returns a value

```
def sum(a, b):  
    return a+b
```

- Example function that prints

```
def hw(name):  
    print "Hello " + name
```

- Call Functions

```
print sum(4, 7)  
answer = sum(4, 7)  
sum(4, 7)
```

```
name = hw("Sue")  
hw("Sue")  
print hw("Jo")
```


Function – return or print?

bit.ly/101f17-0907-4

- Example function that returns a value

```
def sum(a, b):  
    return a+b
```

- Example function that prints

```
def hw(name):  
    print "Hello " + name
```

- Call Functions

```
print sum(4, 7)  
answer = sum(4, 7)  
sum(4, 7)
```

```
name = hw("Sue")  
hw("Sue")  
print hw("Jo")
```

Function Detective

- <http://bit.ly/101f17-0907-5>

Results of Code Analysis

- For details on plurals: <http://bit.ly/1N49u6b>
- How did we call `pluralize` many times?
 - Loop. What is an alternative?
- What does the 'if' statement do?
 - Selects a code block to execute (more next week)
- If you have a question? Write and run code!⁹