Today's "Menu"

(week 5)

- Announcements
- More practice with if-statement and functions
- General program design
- Possibly introduction to Loops
- Questions?

Announcements

- Re Labs/Homework:
  - Study the sample programs to help with use of CONSTANTS and %formatting and source code organization
  - Read the assignments specifications carefully. Can't leave out required features.
  - Let's put main() at "the bottom" of your source code

Announcements

- How I evaluate/test programs
  - Look over specs
  - Evaluate functionality re specifications by running/testing your program.
  - Look at comments/formatting
    - Readability is very important.


```
tax = input('Enter Tax Percent : ') * 10E-3 + 1
```

```
STATE_TAX = 8
TAX_PERCENTAGE = .08 # tax rate
```

```
# amount of tax per dollar on item purchased
TAX_RATE = .08

print '\nProgram calculates total cost of same item purchased.'
print 'State tax is 8 percent.'
```

Question #1

Why document code?

Answer

1. It makes you think about what you are doing
2. It reminds you of what you were doing
3. You may inherit someone else's code – or they may inherit yours
4. It's part of the culture

Aside: Majority of programming work consists of 'maintenance'

Question #2

When do we think about testing?

I.e., when is the best time to think about testing?

Answer

- NOW!
- Successful programmers think about testing *early* and *often.* They don't trust anyone, least of all *themselves!*
- The *best* time to think about testing is when you are figuring out what problem you are solving.
- Thorough testing => no surprises => good sleep. ☺

Code last!

- Always design and think about testing *before* you touch a keyboard.
- You may get away without doing this with 'baby' programs – but you'll never succeed with anything non-trivial – harsh, but true.

How to write a Program™

1. Understand the Specification (the problem)
2. Think about the algorithm (the solution)
3. Come up with test cases (verify the solution)
4. Write some pseudo code
5. Implementation issues
6. Implement
7. Test .. May have to go back to previous step ☹
8. Be happy ☺

Understand Specs

- You won't be able to do anything useful if you don't *understand the problem* you are trying to solve!!
- Do you know about input/process/output and error handling?
- Can you get sample input and/or output?

Think @ Algorithm

- What is the *solution* to the problem?
- Can you come up with a list/sequence of clearly defined steps?
- Are there any special cases to consider?
- Do you have any *new* questions?

Test Cases

- Think about testing NOW!
- Have some correct input/output to compare against.
- Range of values, normal + boundary cases
- Data types
- “crazy” input
- What about no input? Termination?
- ?

Pseudo Code

- Sketch out the solution in some semi-legal programming language
- Don’t worry about syntax
- Tool for communication

Implementation Issues

- What language?
- What variables?
- What data types?
- ?

nslookup / dns

```
C:\Documents and Settings\EB> nslookup cnn.com
Server:  dns-cac-lb-01.rr.com
Address:  209.18.47.61

Non-authoritative answer:
Name:    cnn.com
Addresses:  157.166.224.26, 157.166.226.25, 157.166.226.26,
   157.166.255.18 157.166.255.19, 157.166.224.25

C:\Documents and Settings\EB> nslookup yahoo.com
Server:  dns-cac-lb-01.rr.com
Address:  209.18.47.61

Non-authoritative answer:
Name:    yahoo.com
Addresses:  69.147.114.224, 209.131.36.159, 209.191.93.53
--
Try http://69.63.181.11    |    ipconfig          ipconfig /all
```

ping

```
C:\Documents and Settings\EB> ping google.com

Pinging google.com [64.233.169.105] with 32 bytes of data:

Reply from 64.233.169.105: bytes=32 time=34ms TTL=243
Reply from 64.233.169.105: bytes=32 time=25ms TTL=243
Reply from 64.233.169.105: bytes=32 time=29ms TTL=243
Reply from 64.233.169.105: bytes=32 time=30ms TTL=243

Ping statistics for 64.233.169.105:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 25ms, Maximum = 34ms, Average = 29ms

C:\Documents and Settings\EB>
```


ping

```
C:\Documents and Settings\EB> ping 209.18.47.61
Pinging 209.18.47.61 with 32 bytes of data:

Reply from 209.18.47.61: bytes=32 time=15ms TTL=111
Reply from 209.18.47.61: bytes=32 time=14ms TTL=111
Reply from 209.18.47.61: bytes=32 time=15ms TTL=111
Reply from 209.18.47.61: bytes=32 time=14ms TTL=111

Ping statistics for 209.18.47.61:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 14ms, Maximum = 15ms, Average = 14ms

C:\Documents and Settings\EB> ping franklin.edu
Pinging franklin.edu [66.77.177.140] with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 66.77.177.140:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

tracert

```
C:\Documents and Settings\EB> tracert derspiegel.de

Tracing route to derspiegel.de [195.71.11.67]
over a maximum of 30 hops:

  1     1 ms    <1 ms    <1 ms  192.168.1.1
  2     *        *        *     Request timed out.
  3     7 ms     8 ms     9 ms  gig3-10.grvwoh1-swt401.columbus.rr.com [24.95.86.217]
  4     7 ms     8 ms     8 ms  tge2-1.clmboh1-rtr2.columbus.rr.com [65.25.129.159]
  5    13 ms     6 ms     7 ms  tge2-0-0.clboh1-rtr0.mwrtn.rr.com [65.25.137.197]
  6    44 ms    19 ms    75 ms  ae-4-0.cr0.chi30.tbone.rr.com [66.109.6.68]
  7    42 ms    42 ms    43 ms  ae-2-0.cr0.dfw10.tbone.rr.com [66.109.6.22]
  8    45 ms    43 ms    42 ms  ae-1-0.pr0.dfw10.tbone.rr.com [66.109.6.179]
  9    52 ms    46 ms    52 ms  66.109.9.158
 10    54 ms    68 ms    53 ms  So5-2-0-0-grtnycpt3.red.telefonica-wholesale.net [84.16.12.38]
 11    74 ms   120 ms    67 ms  So1-2-0-0-grtnycpt3.red.telefonica-wholesale.net [84.16.12.161]
 12   139 ms   140 ms   139 ms  So-4-1-0-0-grtfraix3.red.telefonica-wholesale.net [84.16.13.233]
 13   153 ms   161 ms   139 ms  T-Deutschland-4-0-0-0-grtfraix3.red.telefonica-wholesale.net.10.16.84.in-addr.arpa [84.16.10.190]
 14   146 ms   144 ms   151 ms  T-Deutschland-4-0-0-0-grtfraix3.red.telefonica-wholesale.net.10.16.84.in-addr.arpa [84.16.10.190]
 15   146 ms   157 ms   159 ms  rmwc-gtso-de01-ge-0-0-0-0.nw.mediaways.net [195.71.254.78]
 16   157 ms   154 ms   150 ms  195.71.11.67

Trace complete.
```


Hands-On Practice

- Simple function

```
# our function that sums 3 numbers and displays the result
def sum_of_3(n1, n2, n3):
    result = n1 + n2 + n3
    print '%d + %d + %d = %d.' % (n1, n2, n3, result)


# calling the function 3 times.
sum_of_3(3, 9, 100)
sum_of_3(1, 1, -1)
sum_of_3(3.2, 2, 7.9)
```

- Your turn: masGrande function

Summary/Recap

- Questions?