

Today's "Menu"

(week 8)

- Announcements
- Why generally no I/O in functions
- Function 3+1 Q
- Function exercises
- Modules
- Questions?

17-Mar-10

COMP 480 - Winter 2010

1

Announcements

- Exam II coming up next week:
Monday March 21 - Sunday Mar 28
- Next week **Chapter 7** – Files & Exceptions

17-Mar-10

COMP 480 - Winter 2010

2

Comments

```
x = x + 1 # adding 1 to x
```

```
# Ask user for weight in pounds
weight = input('enter your weight in lbs: ')
```

All methods need to have comments:

- purpose
- parameters – if so, what they do
- return values – if so, what should be like **specs!** – see `my_math.py`

17-Mar-10

COMP 480 - Fall 2009

3

```
def bmi_category():
    # this method puts the BMI number into a category.

    if bmi < 18.5:
        print '\n%s you are in the Underweight BMI category'
    elif bmi >= 18.5 and bmi < 25:
        print '\n%s you are in the Normal weight BMI category'
    elif bmi >= 25 and bmi <= 29.9:
        print '\n%s you are in the Overweight BMI category'
    elif bmi > 30:
        print '\n%s you are in the Obese BMI category'
```

17-Mar-10

COMP 480 - Fall 2009

4

```
40: # If the BMI is under 18.5
41: if bmi <= 18.5:
42:     print 'Your weight status is underweight'
43: # If the BMI is 18.5-24.9
44: if bmi >= 18.5 and bmi <= 24.9:
45:     print 'Your weight status is normal'
46: # If the BMI is 25 and 29.9
47: if bmi >= 25 and bmi <= 29.9:
48:     print 'Your weight status is overweight'
49: # If the BMI is 30.0 and above
50: if bmi >= 30:
51:     print 'Your weight status is obese'
```

17-Mar-10

COMP 480 - Fall 2009

5

- Duplicate Code → almost always => function

17-Mar-10

COMP 480 - Fall 2009

6

Functions:

- Let us encapsulate operations (abstraction – we are creating new “operations”)
- Eliminate redundant code (easier maintenance)
- Can take data (via parameters)
- Can return results (via return statement)
- Are incredibly useful!

17-Mar-10

COMP 480 - Fall 2009

7

Functions with **return** Values

1. Simple fn `def fn():`
 2. Fn with parameters `def fn(val1, val2):`
 3. Fn with parameter(s) and return value
- Note: the **return** statement
 - **return** - exits a function
 - **return val** exits the function and *returns* the val to the caller of the function
 - Ordinarily, try to have only **one return** statement, it makes debugging/maintenance of code easier

17-Mar-10

COMP 480 - Fall 2009

8

Function 3+1 Q

- 3 + 1 Questions to always ask about functions:
 1. What does it **do**?
 2. Does it **require information** to do its job?
 3. Does it produce a **result**?

+

Is it **too big**?
- ALWAYS ask yourself these 3+1 questions before you tackle any function.

17-Mar-10

COMP 480 - Winter 2010

9

What Does It Do?

- Tells you the **purpose** of the method.
- The method name should **accurately** reflect what the method does – if the name is too long, break up the method.
- Be sure you have an **algorithm** for the method

17-Mar-10

COMP 480 - Winter 2010

10

Does It Need Information?

- 99% of the time this means PARAMETERS.
- **Functions rarely ask for information from the user directly** – most information comes in via parameters.
- How many pieces of information? => # of parameters.
- What type of information? => type of parameter(s).

17-Mar-10

COMP 480 - Winter 2010

11

Does It Produce a Result?

- This indicates a “return ... ” statement.
- Call will involve an **assignment** statement:
 - E.g., age = input('How old are you? ')
- Try hard to limit yourself to a **single return** statement at the end of your function.
- Set a default return value and modify as needed.

17-Mar-10

COMP 480 - Winter 2010

12

Is It Too Big?

- Use the “name test”.
- The method name should accurately reflect what the method does – if the name is too long, break up the method.

17-Mar-10

COMP 480 - Winter 2010

13

- This function receives the customers name and the total amount to be paid and displays a bill (with logo) for the customer.
- 3 Questions:

17-Mar-10

COMP 480 - Winter 2010

14

- Displays a help screen to the user when they are stuck with the program and don't know how to proceed.
- 3 Questions:

17-Mar-10

COMP 480 - Winter 2010

15

- Given the hours taken, and the point values for all the courses taken, it computes the current GPA for a student
- 3 Questions?

17-Mar-10

COMP 480 - Winter 2010

16

- Given the distance and time it took to drive this distance the function computes your speed.
- 3 Questions?

17-Mar-10

COMP 480 - Winter 2010

17

- Converts a binary 'number' to 'decimal'
- 3 Questions?

17-Mar-10

COMP 480 - Winter 2010

18

Summary/Recap

- Questions?