COMP 141
CS1: Programming Fundamentals
September 17, 2014

Join the St. Jude Tour!!!

- A dedicated tour of St. Jude facilities for Rhodes students
- **Friday, October 3.** Leave campus at 2:00pm. Return by 4:45pm.
- Learn about
  - Pediatric Genome Sequencing Project
  - Cellular and Tissue Imaging
  - Small Animal Imaging
  - Robotic Drug Discovery
  - Proteomics
  - Bioinformatics / Hartwell Center
- **Sign up by emailing your name and cell phone # to Professor Viano (viano@rhodes.edu) by September 29.**

Announcements

- Reminders:
  - MPL Assignment 2 due tonight by 11:59pm
  - Program 2 due tomorrow by 11:55pm
- No class on Monday, September 22nd!
- No office hours on Monday, Sept. 22 or Tuesday, Sept. 23.
def average(a, b, c):
    avg = (a + b + c) / 3
    print("The average of your numbers is ", avg)

def main():
    x = int(input("Give me a number: "))
    y = int(input("Give me a number: "))
    z = int(input("Give me a number: "))
    average(x, y, z)

main()
def average(a, b, c):
    avg = (a + b + c)/3
    print("The average of your numbers is", avg)

def main():
    test1 = input("Give me the first test grade: ")
    test2 = input("Give me the second test grade: ")
    test3 = input("Give me the third test grade: ")
    average(test1, test2, test3)
    hw1 = input("Give me the first HW grade: ")
    hw2 = input("Give me the second HW grade: ")
    hw3 = input("Give me the third HW grade: ")
    average(hw1, hw2, hw3)
    # some code here to weight the test average by 0.75
    # and the quiz average by 0.25 and combine them.
    main()

What we want to do is:

final_grade = 0.75 * (avg from the first call to average) + 0.25 * (avg from the 2nd call)

Return values to the rescue!

def function(arg1, arg2, ...):
    statement
    statement
    [ more statements if desired ]
    return value

value can be a literal, like a number or a string, or it can be a local variable from the function.

Return values to the rescue!

def function(arg1, arg2, ...):
    statement
    statement
    [ more statements if desired ]
    return value

When Python sees a line in a function beginning with "return," the function immediately ends, and the value is sent back to the caller.

Capturing the return value

• Use an assignment statement to "capture" the return value.
  – Otherwise it disappears!

  variable = function(…)

When Python sees a line like this, the function is called normally. However, when the function ends and a value is "sent back" to the caller, the value is put into the variable you specify.
def average(a, b, c):
    avg = (a + b + c)/3
    return avg

def main():
test1 = input("Give me the first test grade: ")
test2 = input("Give me the second test grade: ")
test3 = input("Give me the third test grade: ")
test_avg = average(test1, test2, test3)
print("Your test average is", test_avg)
hw1 = input("Give me the first HW grade: ")
hw2 = input("Give me the second HW grade: ")
hw3 = input("Give me the third HW grade: ")
hw_avg = average(hw1, hw2, hw3)
print("Your homework average is", hw_avg)
final_grade = 0.75 * test_avg + 0.25 * hw_avg
print("Your final grade is", final_grade)

main()
def average(a, b, c):
    avg = (a + b + c)/3
    return avg

def main():
    test1 = input("Give me the first test grade: ")
test2 = input("Give me the second test grade: ")
test3 = input("Give me the third test grade: ")
test_avg = average(test1, test2, test3)
print("Your test average is", test_avg)
hw1 = input("Give me the first HW grade: ")
hw2 = input("Give me the second HW grade: ")
hw3 = input("Give me the third HW grade: ")
hw_avg = average(hw1, hw2, hw3)
print("Your homework average is", hw_avg)
final_grade = 0.75 * test_avg + 0.25 * hw_avg
print("Your final grade is", final_grade)
main()

average returns a copy of its local variable avg back to main, and the value is assigned to hw_avg.

• When writing functions, you should test them to make sure they work in all kinds of situations.
  – Does average() work with negative numbers?
  Floating point numbers?
• You can write a program to do testing, by calling the function with varying arguments.
• Or, you can test your function using the Python Shell (the window where every line starts with >>>)

Class Exercise
Write a program that computes the annual household income for a family with 2 working adults.

1. Prompt the user for their and their partner’s hourly wage, as well as the tax rate.
2. Calculate the total income of for each of the adults.
3. Output the total household income.

Practice
Write a program that asks the user for the total cost of their bill, the percentage tip they’d like to leave (as an integer) and the number of people at their table. Your program should calculate the amount of money each person needs to pay to cover the bill if it is split evenly among all the people.

You need to write 2 functions:
• main: prompts the user for cost of the bill, percentage tip (as an int), and number of people. main calls divide_bill and main will also print out the total amount of the bill each person should pay.
• divide_bill: takes in 3 arguments and returns the amount of money each person should leave.
  – Example: divide_bill(40, 15, 4) means the total bill was $40, you’re leaving a 15% tip, and it’s being split between 4 people. The total amount to split is therefore $46, which means each person pays $11.50. So this function call will return 11.5 (as a float).
Next Time

• While Loops
• Sections 4.1-4.2