

# CS 100 Project One – Spring 2016

**Project Overview:** Everyone carries some money with them. Not everyone carries the same amount, but it is hard to find a person that does not have any money on them at all. This leads to the obvious questions of:

*If we only had pennies and not all the other coins and various bills ...  
How many pennies is that? How much do they weigh? How much space do they take?*

Your program will read eight numbers from the user. These eight inputs correspond to the number of \$20 bills, \$10 bills, \$5 bills, \$1 bills, quarters, dimes, nickels and pennies that you have. Each of these inputs is an integer value. The user will always enter them in this order (\$20–\$10–\$5–\$1–quarter–dime–nickel–penny) and will always give legal input values (all the inputs will be zero or a positive integer).

To complete this project, you need to know a couple of basic facts about pennies. First, we assume all the pennies are new (copper plated zinc) pennies. These pennies

- Have a weight of 2.500 grams
- Have a diameter of 0.750 inches
- Have a thickness of 1.52mm (recall that there are 25.4 mm in one inch)

This information above was taken from [https://www.usmint.gov/about\\_the\\_mint/?action=coin\\_specifications](https://www.usmint.gov/about_the_mint/?action=coin_specifications)

For this project, you need to use functions. We will introduce functions on Wednesday. At a minimum, you need:

- A function to get input from the user. This function takes one argument (a character string that is the prompt for the user when entering input), prints the prompt, reads a single integer from standard input, and returns the integer value that was entered.
- A function that takes an integer representing the total number of pennies that you have and computes the weight of those pennies in pounds. It returns a double that represents this weight.
- A function that takes an integer representing the total number of pennies that you have and computes the volume of these pennies in cubic feet. It returns a double that represents this volume.

## What You Need To Do

- Create a directory called **project1** on your machine. In that directory, create a file named **pennies.c**
- In **pennies.c**, write the code needed to solve the problem stated above. Make sure that your program
  - Has a header block of comments that includes your name and a brief overview of the program
  - Reads eight values from the user (twenties, tens, fives, ones, quarters, dimes, nickels, pennies)
  - Use at least three functions – one for input, one to calculate weight, one to calculate volume
  - Prints the three expected outputs
    - The equivalent total number of pennies for this amount of money
    - The total weight of these pennies (in pounds)
    - The total volume of these pennies (in cubic feet)
- Make sure your program runs properly on **cs-intro.ua.edu**. That is where it will be graded.
- Check some of your answers. Once you have a working program, enter some sample data and then post the results (total pennies, weight, and volume) to Piazza. See if others agree with your answers.
- Bundle your **project1** directory into a single (compressed) zip file. To do this:
  - PC: Using Windows Explorer, right click on the **project1** directory and select “Send To” and then “Compressed (zipped) folder”
  - Mac: Using Finder, use a secondary click on the **project1** directory and select “Compress *foldername*”
- Once you have a compressed zip file that contains your **project1** code, submit that file to Blackboard.

**Project1 is due at 5:00pm on Friday, February 12. Late projects are not accepted.**