Homework 4: More Input & Output

Assigned: Monday 04 March
Due Date: Monday 11 March

Objectives

To gain more experience with `printf()` and `scanf()`, variables, and arithmetic operators.

Reminder: Assignments are an independent effort. This is not a group effort. Assignments are checked to ensure they aren't too similar to that of other students'.

Part 1: Inches to Feet and Inches

Write a program that asks the user for their name and their height in inches, then replies with their name and height in feet and inches.

Example

```
[arsenaul@linux1 hw4]$ gcc -Wall height2.c
[arsenaul@linux1 hw4]$ ./a.out
What is your name? Alice
How tall are you in inches? 79
Hello, Alice. You are 6 feet 7 inches tall.
[arsenaul@linux1 hw4]$
```

Notes

1. Login to GL and make sure you are in your home directory (pwd).
2. Change directory to hw4 (cd cmsc104/hw4) so you can do this assignment in a fresh workspace.
3. A good starting point is height.c from Classwork 4, which should be in your cmsc104/cw4 directory. Make a copy of height.c (`cp ../cw4/height.c height2.c`) and update the header comment block accordingly.
4. The first thing you will need to do is decide if you need any new variables, and if so, what data type they should be. Remember that these should all be declared under the existing variables.
5. In your calculation block, you will use the division operator / and the modulus operator % to convert inches to feet and inches.
6. REMEMBER: In C, when dividing two integer values, the remainder (everything after the decimal point) is thrown out. For example, 17/5 gives you 3.

Part 2: Centimeters to Feet and Inches

Write a program that asks the user for their name and their height in centimeters, then replies with their name and height in feet and inches.

Example

```
[arsenaul@linux1 hw4]$ gcc -Wall height3.c
[arsenaul@linux1 hw4]$ ./a.out
What is your name? Gawain
How tall are you in centimeters? 195
Hello, Gawain. You are 6 feet 5 inches tall.
[arsenaul@linux1 hw4]$
```

Notes

1. A good starting point is height2.c from Part 1. Make a copy of height2.c (`cp height2.c height3.c`) and update the header comment block accordingly.
2. The first thing you will need to do is decide if you need any new variables, and if so, what data type they should be. Remember that these should all be declared under the existing variables.
3. REMEMBER: Feet and inches are always whole numbers, but centimeters do not have to be.
4. Once you are confident you have all the variables you need, you must change the second user prompt to ask for centimeters instead of inches.
5. Next, in your calculation block, convert centimeters to inches, leaving the rest of the calculations from height2.c, as they should still work to calculate feet and inches.
6. REMEMBER: When you divide an integer value by a floating point value, you get a floating point value. If you assign a floating point value to an integer variable, the fractional part is thrown away. So, mathematically 10 / 2.54 is 3.937... but if you assign this to an integer variable, you get 3. For example, after the assignment $n = 10/2.54$ the integer variable n would have value 3. To achieve rounding, you can add 0.5 to the calculation: $n = 10/2.54+0.5$; $m = 8/2.54 + 0.5$. The n would hold 4 and m would hold 3. (Assuming that both n and m are integer variables.)

Grading Rubric

- height2.c header comments: 2 points
- height2.c body comments: 3 points
- height2.c compiles: 15 points
- height2.c does accurate calculation: 25 points
- height3.c header comments: 2 points
- height3.c body comments: 3 points
- height3.c compiles: 15 points
- height3.c does accurate calculation: 25 points
- typescript: 10 points

What to Submit

Use the `script` command to record yourself compiling your programs and running each 3 times, using a different name and number for inches and centimeters each time, or you will not get full credit. Do not record yourself editing your file! Use `exit` to terminate the recording. Then submit your programs and typescript file.

```
[arsenaul@linux1 hw4]$ submit cmsc104_arsenaul hw4 height2.c height3.c typescript
```

Verify Submission

If you *think* you submitted the assignment, but the `submitls` command doesn't show you your file names, then the files were **not** submitted and no grade will be given.

```
[arsenaul@linux1 hw4]$ submitls cmsc104_arsenaul hw4
```