

Create a project called lab2 (if using Visual Studio), and a source file called lab2.cpp.

During recitation, you have been introduced to the concepts of C++'s pass-by-reference mechanism and reference variables. You have also learned about the so-called "magic formula" for changing the way that the output stream cout writes floating point data to the screen.

Write a program that asks the user to enter a weight given in pounds and ounces, where you store pounds in a variable of type int and ounces in a variable of type double. Convert this weight to kilograms and grams, where kilograms is stored in a variable of type int and grams is stored in a variable of type double.

Your program should use at least three functions, not including main, that all return void:

- 1) The first function should be used to get two input values from cin using the pass-by-reference mechanism.
- 2) The second function should take 4 parameters: pounds, ounces, kilograms, and grams. After it is run, this function will have changed the values of kilograms and grams so that they represent an equivalent weight to our original input value in pounds and ounces. Here, you will still need to use the pass-by-reference mechanism, but notice that you do not need it for all of the parameters. Only use pass-by-reference for a specific parameter if you need the function to be able to change the value of the parameter you are passing in.
- 3) The third function should also take 4 parameters, and should output the result of the calculation to cout by displaying both the starting values and both of the resulting converted values. This function should not do any calculations. Your output for ounces and grams should be displayed in fixed notation, showing the decimal place with 8 decimal digits of precision.

In your second (conversion) function, combine pounds and ounces into one variable containing the corresponding number of pounds. Then, convert the combined pounds into kilograms by using the following conversion factor: 0.45359237 pounds in one kilogram. Finally, split those kilograms into kilograms and grams before returning from the function. You may find the floor function in the library <cmath> useful. There are 16 ounces in a pound, and 1000 grams in a kilogram.

Recall, from earlier courses we hope, that constants that are not zero or the number 1 should be declared as named constants in your code.

If given correct input, the output of your program should look something like this:

Please enter the number of pounds: 5

```
Please enter the number of ounces: 13.5697
5 pounds and 13.56970000 ounces converts to
2 kilograms and 652.65637395 grams
```

Your program should also handle invalid input, for example:

```
Please enter the number of pounds: the number of pounds
That's not a number greater than or equal to 0! Please try
again...
Please enter the number of pounds: -2
That's not a number greater than or equal to 0! Please try
again...
Please enter the number of pounds: 5
Please enter the number of ounces: 17
That's not a number greater than or equal to 0, and less than 16!
Please try again...
Please enter the number of ounces: okay, okay...
That's not a number greater than or equal to 0, and less than 16!
Please try again...
Please enter the number of ounces: 13.2579
5 pounds and 13.25790000 ounces converts to
2 kilograms and 643.81699264 grams
```

(See <https://isocpp.org/wiki/faq/input-output> for examples of how to skip invalid input characters.)

When finished, one member of your group should turn in your lab2.cpp file on Blackboard.