Cp Sc 1110 Program 3
Due: Tuesday Oct. 14th, 11:59 pm

The purpose of this assignment is to give you practice in using repetition and functions.

Problem Statement

Orange Labs wants to test LED bulb output. For each bulb in a batch of bulbs they take 3 to 5 readings which range from 750 to 850 lumens. They create a text file with the month, day, and year of the batch test. After the test of each bulb they record in the file the number of readings and then the result of each reading. Write a C program for them with the following specifications:

1. General:
   1.1. Save your code as prog3.c.
   1.2. For all functions except main place prototypes in the global area before main and the definition after main.
   1.3. Use the functions defined below and closely follow the sample below.
   1.4. The program will read a single file using standard input redirection with no prompting.
   1.5. Each function will only have one return statement as the function's last statement.
2. *main*
   2.1. Procedure:
      2.1.1. Read month, day, and year into separate variables, print a blank line, and then the headings.
      2.1.2. Use a counting loop to obtain the bulb with the highest average reading using *processLED*, stopping when -1 is returned. One way to set up this loop is to have a priming call to *processLED* before the loop and then another at the end of the loop. Another is to have a call in the test of the loop.
      2.1.3. Print the highest average bulb along with the bulb's average preceded and followed by a blank line.
3. *processLED*
   3.1. Parameters: (1) Integer sequential LED bulb number (count)
   3.2. Return: Integer average reading or -1 if end of data
   3.3. Procedure (no printing):
      3.3.1. Read the number of readings for this bulb.
      3.3.2. If end of data return -1 otherwise return the average reading obtained by calling *processLumens* using only one return statement.
4. *processLumens*
   4.1. Parameters: (1) Integer sequential bulb number and (2) integer number of readings
   4.2. Return: Integer average reading rounded
   4.3. Procedure:
      4.3.1. Print the bulb number.
      4.3.2. Read, process, and print the readings.
      4.3.3. Calculate and print the average rounded to the nearest integer. You may use the rint function found in math.h. (Google: C rint function. If you use it, remember to use the –lm option at the end of your compile command.)

On a SOC machine, you can copy the sample test file to your current directory by entering
`cp /home/psterli/public_html/prog/sample3.txt ./`
You can view the file in a browser and save on your computer from here:
`http://www.cs.clemson.edu/~psterli/prog/sample3.txt`
To run your program with the sample file:
`./a.out < sample3.txt`

You should also make up your own job file data and test for any additional conditions that should be tested.

Sample Input

```
10 1 2012
3 788 838 783
5 826 796 834 849 759
4 838 845 845 804
4 808 823 757 765
```

Sample Output – To be followed closely including column alignment for bulb

```
Test date: 10/1/2012
LED Lumens
  1 788 838 783 Avg = 803
  2 826 796 834 849 759 Avg = 813
  3 838 845 845 804 Avg = 833
  4 808 823 757 765 Avg = 788

LED bulb 3 has the highest average reading of 833 lumens
```

Requirements

1. Your program must adhere to this assignment's problem statement requirements and the general programming assignment requirements. Violations will lead to deductions. General requirements: http://www.cs.clemson.edu/course/cpsc111/lect/requirements.pdf

2. Submit prog3.c electronically using Webhandin:
   - 2.1. If your program is stored on the SOC system and you are submitting from a non-SOC machine: You must first transfer your C program to your local machine. If your machine is a Windows machine you will use SSH Secure Shell File Transfer Client, MobaXterm Sftp download, or a comparable product. On a Mac OS or Linux machine, you will use sftp. See the appropriate documentation for instructions.
   - 2.2. Go to http://handin.cs.clemson.edu to open Webhandin.
   - 2.3. If requested sign in with your username and password.
   - 2.4. On the My Courses page, click on the link containing `CPSC 1110`.
   - 2.5. On the Assignment page select `prog3`.
   - 2.6. The place where you put your files is referred to as a "bucket". When browsing your bucket you'll be shown some information about the assignment and a list of files which you have submitted. From this page, you are able to submit a file or delete a previously submitted one. To submit a file, click the button toward the bottom of the page. To delete one, click the delete button next to the file. If you've submitted a file, there will be a time noted at the top of the page which marks when Webhandin received your submission.
   - 2.7. Submit `prog3.c`. After submitting, click on the filename link. Your program should be displayed.