Lab Purpose

Defining ADTs using structures, arrays of structures, manipulating arrays of structures.

Always bring to class

1. Gaddis' book, How-to handouts from Canvas and your class notes.
2. This assignment sheet & the grade sheet for this lab already printed out.
3. USB Flash drive(s) or other storage media.

Mandatory Instructions

1. Copy data file lab3.txt from the class library.

   $ cp lib/lab3.txt . ← That is a space and then a period

2. Define ADT **Shareholder** using a struct that will hold shareholder name, type of shares, and the number of shares. Also declare an array of **Shareholder** struct(s) called **ClientList**. Although there are 50 elements in the array, the array will not be entirely filled. Do not process empty/unfilled array structures in any of your functions.

   Your mission, should you decide to accept it, is to write the functions for which prototypes have been provided below. Declare any variables you will need, however, there is a constraint you must follow: **you are only allowed to use one loop per function**.

   a) The fillArray function that will read data file, lab3.txt, and populate your array of struct(s). Sample data for a shareholder is shown below (name, type of shares, and number of shares held). You will need to utilize both getline() and infile >> to read the mixed data types. Remember to add infile.igone() *before* next getline() after infile >> statement.

   ```
   Matt Johnson
   Gold
   52
   ```

   b) Write a function that will print all of the clients that fit a particular share category. Additionally print the shareholder with most shares for that category.

   Keep calling this function from main() as long as user does not enter *Done*. You must validate user input and only accept *Gold, Silver, Bronze, or Done* (case exactly as shown).

   c) Create a function that will display a summary breakdown of the assets for each share type. **You are only allowed to use one loop**. Call this function once, after the user entered 'Done'. Use prices per share as shown below.

      a. Gold Shares are valued at 9.95 per share
      b. Silver Shares are valued at 5.75 per share

c. Bronze Shares are valued at 2.25 per share

Run the program and test with each share types: Gold, Silver, and Bronze. The screen shot below should be used as guidance for formatting and not validating your program. Data file may not be the same.

```
=====================================
              Silver Clients
=====================================
Adam Williams       45
Andrew Rine         89
Brandon Rubey       98
Charles Yang        75
Corbin Bruns        178
Cory Boyce          97
David August        102
Isaiah Xie          73
Melissa Spencer     54
Rachel Higgins      84
>>>> Corbin Bruns has most shares with 178

Share type [Gold | Silver | Bronze | Done]: Done
=====================================
Share Type        Quantity      Value
=====================================
Gold                430       4149.50
Silver              895       4251.25
Bronze              560       1036.00
```

What to turn in?

Make a photo of your program by typing the commands below at the cs2020 $ prompt. Make sure to copy lab3.txt data file into your cs2020 directory from lib on BGLINUX.

```
$ photo lab3.log
$ ls -l
$ cat lab3.cpp
$ g++ lab3.cpp
$ ./a.out           // Enter Exactly: Gold, Silver, Bronze, done, Done
$ Ctrl-d
```

Don't forget to upload your grade sheet to Canvas!