

CSCI 2275 Programming and Data Structures  
Spring 2018  
Instructor: Rhonda Hoenigman  
Assignment 1  
Due Friday, September 7 by 11 AM

## For Sale or Wanted Message Board

Please read the entire assignment carefully before beginning. In this assignment, you're going to develop a simulated message board that monitors items *wanted* and items *for sale* and looks for matches. When a match is found, e.g. there is a bike for sale for \$50 and a bike wanted, where the buyer will pay up to \$60, then the item is removed from the message board.

There is a file on Canvas called *items.txt* that includes up to 100 wanted or for sale items in five categories: bike, microwave, dresser, truck, or chicken. Each line in the file is one item. There is also a driver file that opens the file, reads each line, and uses an array of *structs* to store the items. The driver code assumes there will never be more than 100 lines in the file, therefore, the array of *structs* has a fixed size of 100 to represent the items available on the message board. Each *struct* represents an item and has a type, such as bicycle or truck, a price, and whether it is for sale or wanted. (The for sale or wanted is represented as a Boolean, where 0 is for sale and 1 is wanted.)

The data in the file is read into the array by the driver program, your program needs to read the array and check if there is a match between the existing items in the message board. There are two options to consider:

### Match is not found in the new array

If a match is not found in the array, print the information about the unmatched item using the commands:

```
cout<<"Match not found"<<endl;  
cout<<itemArray[x].type<<" "<<itemArray[x].price<<endl;
```

### Match is found in the new array

If a match is found in the new array, use the best match found, and remove the matched items from the array and shift the array to fill the gaps left by the removed items. (Section 3.2.4 of your data structures e-book shows the algorithm for deleting an item from an array and shifting.) Print the action performed, using the command:

```
cout<<itemArray[x].type<<" "<<itemArray[x].price<<endl;
```

where *itemArray* is the array of *structs* and *x* is the index where the for sale item was found in the array. The *type* is one of the following: **bike**, **microwave**, **dresser**, **truck**, or **chicken**. The *price* is the actual item cost, not what the user is willing to pay.

## Other things your program needs to do

### Use two definitions for best match

Your program needs to generate two different ways of finding the best match. In the first approach, you need to find the maximum profit for the seller. In the second approach, you need to find the maximum bargain for the buyer.

Your program should have a separate function for maximum profit and maximum bargain. Your code in main should run both of these approaches. During your grading meeting with your TA, be prepared to comment on the differences in the code and in the output produced.

### How to know if your output is correct?

There is a Piazza forum for this class and you are welcome to post the output you get for the `garageSale.txt` file on Piazza and ask if other students get the same answer. If you want to test your code with a smaller data set, create a new `.txt` file and use that file as the input file when you run your code. Please don't post your code on Piazza.

### What is a Struct?

I will talk about structs in class on Friday. For more information on what *structs* are and how to create them, there are videos on the CU Boulder Data Structures CSCI 2270 YouTube channel that describe structs in more detail. The videos are Data Structures Tutorial 9 and 10.

## Submitting Your Code:

### Submit your assignment to Canvas

Submit your `.cpp` file through Canvas using the Assignment 1 Submit link. Make sure your code is commented enough to describe what it is doing. Include a comment block at the top of the `.cpp` file with your name, assignment number.

### What to do if you have questions

There are several ways to get help on assignments in 2275, and depending on your question, some sources are better than others. There is a discussion forum on Piazza that is a good place to post technical questions, such as how to shift an array. When you answer other students' questions on Piazza, please do not post entire assignment solutions. If, after reading the assignment write-up, you need clarification on what you're being asked to do in the assignment ask the TA or the Instructor. We will be monitoring Piazza regularly.