CSCI 2270 Data Structures and Algorithms

Summer 2014

Instructor: Hoenigman

Assignment 1

Due Sunday night by 5pm

**It’s like Craigslist, only different**

In this assignment, you’re going to develop a simulated community 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 will pay up to $60, then the item is removed from the message board.

You have been provided with a file that includes 100 wanted or for sale items in five categories: bicycle, microwave, dresser, truck, or chicken. Your program needs to open the file read each line. Each item should be stored in an array of structs, where each struct has a type, such as bicycle, a price, and whether it is for sale or wanted. (You can treat for sale or wanted as an integer or Boolean, where 0 is for sale and 1 is wanted, for example.) The struct array represents the message board.

As lines are read from the file, compare the item to existing items in the struct array to search for a match. If a match is not found in the struct array, add the item to the array at the first unused position, e.g. if there are four items, add the item to position five. If a match is found, do not add the new item to the array and remove the matched item that is already in the array. Shift the array to fill the gap left by the removed item. Write the action performed to a file, such as *Bicycle, $50*. The formatting of the message is up to you, but needs to include the object and the price.

**Other things your program needs to do**

Include a function that will print out the state of the message board at any time. The function parameters and return values are at your discretion, but the function needs to be able to be called at any point in your program and correctly print the contents of the struct array.

Count operations, where an operation is defined as any step in the program that scales with the number of data points. For example, each read from the file is considered an operation because the file size can change. Searching the message board is also considered an operation because the size of the message board will change. Processing each column that is read from the file is not an operation because the number of columns is constant for all lines in the file.