TCSS 333C Summer 2017 HW4 Structures, Arrays, and File I/O

Due: by midnight, Thursday July 20 (or with 10% late penalty, by midnight Friday July 21)

Write a program that reads in one file and writes to two output files. The input file must be called hw4input.txt. The output files must be called hw4time.txt and hw4money.txt (see below). Use these exact file names in your code!

The input file contains a list of items purchased by the customers of a store.
Each line looks like this: Smith 5 sweater $12.50 The line contains

- the name of the customer
- the number of items ordered
- the name of the item
- the price of one item

In the input file, customer purchases are mixed together. For example:

```
Smith 3 Sweater $22.50
Reich 3 Umbrella $12.50
Smith 1 Microwave $230.00
Lazlo 1 Mirror $60.00
Flintstone 5 Plate $10.00
Lazlo 1 Fridge $1200.00
Stevenson 2 Chair $350.00
Smith 10 Candle $3.50
Stevenson 1 Table $500.00
Flintstone 5 Bowl $7.00
Stevenson 2 Clock $30.00
Lazlo 3 Vase $40.00
Stevenson 1 Couch $800.00
```

You can assume that there are at most 20 customers and that each customer has purchased at most 10 items. The longest possible customer name is 29 characters.

Your program must read in the data in this type of input file and store it in an array of customer structs. Each customer struct must have the customer's name and an array of the items purchased by that customer (as well as the current size of that array). The items in the item array must be structs too. Each item struct must include the name of the item, how many were ordered, and the price for one item. Add more fields to either struct (customer or item) if you need to.

After storing all this data, your program must create two output files, the chronological listing and the financial listing.

In the chronological listing (saved in file hw4time.txt), you must list every customer in the order in which the customer first appeared in the input file. For each customer, you must list ordered items in the order in which those items appeared in the input file. For the example shown above, the output would be:

```
Smith
Sweater 3 $22.50
Microwave 1 $230.00
Candle 10 $3.50

Reich
Umbrella 3 $12.50

Lazlo
Mirror 1 $60.00
Fridge 1 $1200.00
```

```
Vase 3 $40.00

Flintstone
Plate 5 $10.00
Bowl 5 $7.00

Stevenson
Chair 2 $350.00
Table 1 $500.00
Clock 2 $30.00
Couch 1 $800.00
```

Flintstone is the fourth customer because in the input file, he is the fourth customer to be mentioned. The plate he ordered is listed before the bowl because that is the order of the items in the input file.

In the financial listing (saved in file hw2money.txt), you must list the customers in order of the total value of their purchases, the largest total value customer appearing first. The items should be listed in order of the value of each item, the largest value item first. (The value of an item is not the unit price, but the unit price times the quantity ordered.) For the sample data this gives:

```
Stevenson, Total Order = $2060.00
Couch 1 $800.00, Item Value = $800.00
Chair 2 $350.00, Item Value = $700.00
Table 1 $500.00, Item Value = $500.00
Clock 2 $30.00, Item Value = $60.00

Lazlo, Total Order = $1380.00
Fridge 1 $1200.00, Item Value = $1200.00
Vase 3 $40.00, Item Value = $120.00
Mirror 1 $60.00, Item Value = $60.00

Smith, Total Order = $332.50
Microwave 1 $230.00, Item Value = $230.00
Sweater 3 $22.50, Item Value = $67.50
Candle 10 $3.50, Item Value = $35.00

Flintstone, Total Order = $85.00
Plate 5 $10.00, Item Value = $50.00
Bowl 5 $7.00, Item Value = $35.00

Reich, Total Order = $37.50
Umbrella 3 $12.50, Item Value = $37.50
```

In addition to main, you must have separate functions to

- read in the input file
- create the output file hw2time.txt
- create the output file hw2money.txt
- sort customers based on total value of purchases
- sort items based on total value of the item

Add other separate functions as you wish; there are good opportunities to do that. No global variables allowed!

Here's another way of thinking of the assignment. You will have a list of customers and each customer will have a list of purchases. As you read through the input file, you will often need to add another customer to your list of customers. You will also have to add another item to some customer's list of items. Finally you will sort all the lists.