CSE 2312 – Homework #1

Assigned: Thursday, August 22, 2024
Due: Thursday, August 29, 2024 at the end of class

Assignment:
Purpose: Show each of us where your C programming skills are at, get information that will aid in assessing the CSE department's programming courses, and refresh your memory on programming concepts that will be used in this course.

Task:

1. (10 points) At the top of your code, as a comment, tell me who your instructor was for the courses below. If for either of them you didn't take the CSE department course, then tell me what course you took in its place (e.g., transferred from TCC).

   - Introduction to Programming (this is 1310 in the CSE department)
   - Intermediate Programming (this is 1320 in the CSE department)

2. (90 points) On Canvas is a skeleton file to fill in: `hw01.c`. It is already named correctly (you should keep this name) and has the comment section to enter your programming instructors' names as described in part 1.

   (a) You will write C a program that can read a comma-delimited file, `data.csv`, and print a report of the total quantity of fruit purchased per person, with the names of the people in ascending order.

   (b) `data.csv` has the following structure: `person,type of fruit,quantity purchased`. An example line is

   ```
   Thaddeus,apples,4
   ```

   We know the following about the data:

   i. `person:` will be at most 20 characters.
   ii. `type of fruit:` will come from the set {`apples`, `bananas`, `oranges`}.
   iii. `quantity purchased:` this represents the quantity for this particular purchase and will be an integer in the range of 1 - 99.

   I am telling you this so that you can pre-allocate space correctly. You are not expected to dynamically allocate space using `malloc()`.

   (c) To store the total fruit quantities per person before you create the report, you should create an array of structures.

   - Assume that all occurrences of a particular name refer to a specific person. There are at most 10 unique names.
   - The potential fruit types are as described above and should in some way be represented in your structure definition.

- The total fruit quantities will fit in a C variable of type `int`.

(d) For the output:

- Total width of the output should be 33 characters. Here is an example of the widths, but **do not** include the column counts in your output:

```
          1         2         3
12345678901234567890123456789012 3
Alexey                apples =  4
```

- The entries should be sorted by name in ascending order (i.e., alphabetical order). Each person's name should only be printed once.
- Names should be left-justified; total quantities per fruit are right-justified.
- The fruit names should be in ascending order.
- The equal signs will be aligned.
- The quantities shown should be the total quantities for all purchases of a specific type of fruit by a specific person and will not require more than two digits of space.
- The output should not use tabs; only use spaces for alignment.

(e) You should not hard-code your program to the specific values in the version of `data.csv` uploaded to Canvas (other than what is mentioned above), but for that file the expected output should be

```
Alexey                apples =  4
                     bananas =  8
                     oranges = 10
Dominic               apples =  9
                     bananas =  7
                     oranges =  7
Jacob                 apples =  9
                     bananas = 13
                     oranges =  8
Joel                  apples = 16
                     bananas =  0
                     oranges = 14
Lucia                 apples =  0
                     bananas = 13
                     oranges =  3
Thaddeus              apples = 16
                     bananas =  3
                     oranges =  5
```

If I change the names of the people, the quantities for each purchase, or the number of lines in the file, your program should still work correctly.

(f) Submit your code in Canvas. Note that if you submit multiple times before the deadline, which is fine to do, then Canvas may change the name for each additional submission. I don't think you can do anything about this, so I will deal with it on my end.