CST8234 – C Programming W18 (Lab 2)

Programming Exercise

The purpose here is to make sure that you

- Write a simple program, following the requirements, exactly
- Use a make file
- Use printf and scanf.

Requirements

You are going to write a simple invoice generator.   The user will type a number of orders on a line, and you will present a nicely-formatted display of the results.

The user will then type in CTRL-D to end the session, which will cause your program to then spit out the total price of the orders. Take a look at the following…

```
$ ./lab2.exe
Enter multiple triplets of <product-id> <quantity> <price> (e.g., "362 1 19.95"):
362 1 199.95 1011 333 .99 99999 12 469
Line     Prod ID      Qty           Price          Amount
----     -------      ---           -----          ------
  1      00362          1          199.95          199.95
  2      01011        333            0.99          329.67
  3      99999         12          469.00         5628.00
                                    -----        --------
                                    Total         6157.62
```

There are a couple of things to note.

- In the example above, the program spit out the headers and the first three lines as a result of the input… and only when the user typed CTRL-D did the last two lines appear
    - Hint: you may find testing easier if you use 'echo' and pipe the output to your program (e.g., 'echo "362 1 199.95 1011 333 .99" | ./lab2.exe')
- ==Some of the columns are left-aligned (e.g., the numbers in "Prod ID") and some are right aligned (all the other columns).==
    - How are you going to control this? Hint: let printf do this for you… you'll probably have to google the answer, or look in K&R.
- The columns that show monetary values always have two decimals, even the ones that end with zeros (e.g., the user entered "469", but it displayed as "469.00")
    - How are you going to control this? Hint, don't programmatically test what the number ends with… let printf do it for you. Google if you have to.
- The Product ID values are left-padded with zeros (e.g., the user entered "362", but it displayed as "00362")

- How are you going to control this? Hint, don't programmatically test how long the product ID is… let printf do it for you. Google if you have to.
- Everything is perfectly aligned. You will lose major marks if your invoice is misaligned.
  - Hint: don't count the number of spaces… use tabs ('\t') to separate the fields, and use printf's size specifiers to control width and alignment (and use this approach for the header rows as well as the data rows)

Error checking

If the user types in a non-numeric argument for any of the values, or is missing a value, then the program will spit out an error message that tells the user which order was incorrect, as shown below

```
$ ./lab2.exe
Enter multiple triplets of <product-id> <quantity> <price> (e.g., "362 1 19.95"):
362 1 199.95 1011 333                    Missing Price
Line    Prod ID      Qty          Price          Amount
----    -------      ---          -----          ------
  1     00362          1          199.95         199.95
Error processing order 2
```

This error won't be visible until the user types in CTRL-D once or twice.

You'll need to try to read in the values (int, int, float)—3 at a time—and only if scanf returns the correct value will you print out a line of the invoice (and possibly the header, if it's the first order being processed). If scanf doesn't return the expected value, you'll test for -1 (i.e., EOF encountered) and either spit out the total, or an error message.

Submission

When you are complete submit your program to Blackboard.

But… before you do, please check that you've satisfied the following submission requirements

1. Did you make sure that you have a header comment in your source file (e.g., main.c)?
2. Did you confirm that your zipped submission is a ".zip" file (not a '.rar' or '.tar.gz' or '.7z' file)?
3. Did you zip up a folder that includes your _user name_, and the lab/assignment indicator?   I.e., if you open up your own zipped submission, you should see a _folder_ called (for example) "smit9112_L1". If you just see _file(s)_, you've done it wrong, and you'll need to go to the _parent_ folder, and try zipping your lab folder.
4. Did you remove all the unnecessary files from the folder contained in your zipped submission? I.e., you open up your own zipped submission, and click on the folder called (for example) "smit9112_L1", you should see _just your makefile and your source file (e.g., main.c)_.
5. Is your makefile actually called 'makefile' or 'Makefile' (without any filename extensions?)

If you don't satisfy submission requirements #2 or #3 you will get ZERO on this lab.   If you realize afterwards that you've made a mistake, don't panic! you are allowed to correct your mistake and re-submit.   But you ONLY get TWO submissions per lab/assignment, so try to make sure you double-checked everything _before_ doing your first submission… and only use the second submission in case of emergency.