TEXT FILE PROCESSING [20 + 5 POINTS]

You are NOT allowed to use functions which were not discussed in class (unless specified otherwise).

Please take note of the following for the challenges covered in Part 3:

1. Your task is define functions that will provide real-life answers to real-life questions based on the PSEI historical data.
2. The function **`Initialize_SHD_Data_Structure()`** should be called first before the other required functions.
3. Your C program should NOT display anything on the screen as output.
4. Your C program should write the output onto designated text files using text file processing functions **`fopen()`**, **`fprintf()`** and **`fclose()`**.

INTRODUCTION

Buying and selling of stocks can be done conveniently through an online broker[1]. When an investor buy or sell stocks, there are charges that will have to be paid. For a BUY transaction, charges include *Commission*, *VAT, SCCP Fee and PSE Fee*. For a SELL transaction, the same charges are applied plus a *Sales Tax.*

PREPARATORY TASK

- **Read** real-life details on Trading and Handling fees in https://www.colfinancial.com/ape/final2/b_home_new/FAQS.asp. **Study** the example computations for BUY and SELL transactions.
- **Experiment** with an online trading calculator https://www.abcapitalsecurities.com.ph/AbCapital/index.php/support/trading-calculator. Plug in actual values using stock historical data in the SHD folder. A screenshot of the calculator is shown below for your reference. The *"Transaction Fee"* is the PSE Fee. Note that the values shown are the same as those used in the example mentioned in the first bullet. The calculator will be useful in verifying your answers for the next set of challenges.

Trading Calculator

BUY		SELL	
STOCK	ali	STOCK	ali
QTY	20000	QTY	20000
PRICE	5	PRICE	5.2
Buy Gross	100,000.00	Sell Gross	104,000.00
Buy Comm	250.00	Sell Comm	260.00
VAT	30.00	VAT	31.20
SCCP	10.00	SCCP	10.40
Transaction Fee	5.00	Transaction Fee	5.20
		Sales Tax	624.00
Total Charges	295.00	Total Charges	930.80
Net	100,295.00	Net	103,069.20
NET PROFIT:	2,774.20	PERCENT GAIN:	2.77

[1] There are several online brokers such as BPITrade, FirstMetroSec, COL.

GRADED TASKS: Define the functions for Challenge #6 and #7.

Refer to the accompanying file **LASTNAME_C6to7.c** for the skeleton code that you'll need to complete.

Challenge #6: Buy a Stock [10 points].

Question: If an investor/trader bought **<number of shares>** of stock **<code>** on **<buy date>** how much should be paid for the different charges? How much is the Net Amount be paid by the investor? Assume that the investor/trader bought the stock using the average of the OHLC prices.

For purpose of simplicity, assume that all parameters, i.e., those in angled brackets are valid. That is, the **<number of shares>** is a positive whole number, the stock **<code>** is in the list of PSEI codes, and the **<buy date>** exists as a date with transaction data.

To answer the question, write a function that will accept the parameters (those in angled brackets above), compute and write in a text file related details shown in the file format below. Use **BUY_code_YYYYMMDD.txt** as text file name. For example, if the stock bought on 01/02/2014 is ALI, then the text file should be named as **BUY_ALI_20140102.txt**. The number of shares is a whole number so there should be no decimal point. The price and all the other amounts are **double precision floating point numbers** which should be encoded in the text file with **FOUR** digits after the decimal point. The spacing does not matter but strive to achieve values that are aligned to the right as shown in the attached example **BUY*.txt** files.

DATE	<date>
STOCK	<code>
NUMBER_OF_SHARES	<number of shares>
PRICE_PER_SHARE	<average of OHLC>
GROSS_AMOUNT	<amount 1>
COMMISSION	<amount 2>
VAT	<amount 3>
SCCP_FEE	<amount 4>
PSE_FEE	<amount 5>
TOTAL_CHARGES	<amount 6>
NET_AMOUNT	<amount 7>

Challenge #7: Sell a Stock [10 points].

Question: If an investor/trader sold **<number of shares>** of stock **<code>** on **<sell date>** how much should be paid for the different charges? How much is the Net Amount be received by the investor? Assume that the investor/trader sold the stock using the average of the OHLC prices.

Just like in the previous challenge, assume that all parameters are valid.

To answer this question, write a function that will accept the parameters (those in angled brackets above), compute and write in a text file related details shown in the file format below. Use **SELL_code_YYYYMMDD.txt** as text file name. For example, if the stock sold on 12/28/2018 is ALI, then the text file should be named as **SELL_ALI_20181228.txt**. Note that the format of the text file is essentially the same as in the previous challenge except that it includes a row for sales tax. Refer to example files **SELL*.txt**.

DATE	<date>
STOCK	<code>
NUMBER_OF_SHARES	<number of shares>
PRICE_PER_SHARE	<average of OHLC>
GROSS_AMOUNT	<amount 1>
COMMISSION	<amount 2>
VAT	<amount 3>
SCCP_FEE	<amount 4>
PSE_FEE	<amount 5>
SALES_TAX	<amount 6>
TOTAL_CHARGES	<amount 7>
NET_AMOUNT	<amount 8>

TESTING & SCORING

Always make sure to test your programs thoroughly. Your program should not have any syntax error, warning and logical error. The testing technique that you should apply have already been described and discussed in our class. In case you already forgot about it, please click this link and make sure to learn and practice first the recommended testing technique.

- A solution with a syntax error will automatically get a score of 0 for all challenges required in MP Part 3. Thus, the score will be 0/25.
- A solution with a warning will automatically get a minus one for every type of warning (for example: minus one is applied for *"unused variable"* type of warning, another minus one is applied for *"non-void function does not return a value"* type of warning.)

DELIVERABLES

Submit THREE files listed below via Canvas. Take note of the submission deadline.

1. **`LASTNAME_C6to7.c`**

2. **`LASTNAME_DS.h`**

3. **`LASTNAME_TESTBUYSELL.txt`** **for [5 points]** which contains:
   - BUY transaction of 1000 (one thousand) shares at the beginning of 2016 for each of the 30 PSEI stocks (i.e., 1000 shares of ALI, 1000 shares of AEV, …, 1000 shares of URC).
   - SELL transaction of 1000 (one thousand) shares at the end of 2016 for each of the 30 PSEI stocks.

To be continued… (Part 4 will be sent in another email).