Fall 2016.

Grocery Store Inventory System

IPC144 Project (Milestone 1, Due Sat Oct 29th 23:59)
V1.1 (marking section completed)

In a grocery store, in order to be able to always have the proper number of items available on shelves, an inventory system is needed to keep track of items available in the inventory and make sure the quantity of the items does not fall below a specific count.

Your job for this project is to prepare an application that manages the inventory of items needed for a grocery store. The application should be able to keep track of the following information about an item:

1- The SKU number
2- The name (maximum of 20 chars)
3- Quantity (On hand quantity currently available in the inventory)
4- Minimum Quantity (if the quantity of the item falls less than or equal to this value, a warning should be generated)
5- Price of the item
6- Is the item Taxed

This application must be able to do the following tasks:

1- Print a detailed list of all the items in the inventory
2- Search and display an item by its SKU number
3- Checkout an item to be delivered to the shelf for sale
4- Add to stock items that are recently purchased for inventory (add to their quantity)
5- Add a new item to the inventory or update an already existing item
6- Delete an item from the inventory (optional for extra marks)
7- Search for an item by its name (optional for extra marks)
8- Sort Items by Name (optional for extra marks)

PROJECT DEVELOPMENT PROCESS

To make the development of this application fun and easy, the tasks are broken down into several functions that are given to you from very easy ones to more complicated one by the end of the project

Since you act like a programmer in this project, you do not need to know the big picture. The professor is your system analyst and designs the system and all its functions to work together in harmony. Each milestone is divided into a few functions. For each function, firstly, understand the goal of the function. Secondly, write the code for it and test it with the tester. Once your

code for the function passes the test, set it aside and pick up the next function. Continue until the milestone is complete.

The Development process of the project is divided into six milestones and therefore six deliverables. The first five deliverables are mandatory and conclude full submission of the project. The sixth milestone is optional; for those who want to do some extra work for the challenge and the bonus marks. For each deliverable, a tester program (also called a unit test) will be provided to you to test your functions. If the tester works the way it is supposed to do, you can submit that milestone and start the next. The approximate schedule for deliverables is as follows

- Kickoff week 7
- The UI Tools Due in 10 days
- The Application User Interface Due 5 days after UI
- The Item IO Due 7 days after Application User Interface
- Item Storage and Retrieval in Array Due 10 days after Item IO
- File IO and final assembly Due 5 days after Item Storage (project completed)
- Item Search by name, delete and sort (optional) 7 days after Project completion

FILE STRUCTURE OF THE PROJECT

For each milestone, a source file is provided under the name ipc_msX.c that includes the main() tester program. (Replace X with the milestone number from 1 to 6)

The main program acts like a tester (a unit test). Code your functions in this file and test them one by one using the main function provided. You can comment out the parts of the main program for which functions are not developed yet. You are not allowed to change the code in tester. Make sure you do not make any modifications in the tester.

MARKING:

Please follow this link for marking details:
https://scs.senecac.on.ca/~ipc144/dynamic/assignments/Marking_Rubric.pdf

MILESTONE 1: THE USER INTERFACE TOOLS (DUE SAT OCT 29TH)

Download or Clone milestone 1 from https://github.com/Seneca-144100/IPC_MS1

In ipc_ms1.c write the following functions:

```
void welcome(void);
```

Prints the following line and goes to newline

```
>--=== Grocery Inventory System ===---<
```

```
void prnTitle(void);
```

Prints the following two lines and goes to newline

```
>Row |SKU| Name               | Price  |Taxed| Qty | Min |   Total    |Atn<
>----+---+--------------------+--------+-----+-----+-----+------------|---<
```

```
void prnFooter(double gTotal);
```

Prints the following line and goes to newline

```
>-------------------------------------------------------+----------------<
```

Then if gTotal is greater than zero it will print this line: (assuming gTotal is 1234.57) and go to new line.

```
>                                          Grand Total: |     1234.57<
```

Use this format specifier for printing gTotal : **%12.2lf**

```
void clrKyb(void);
```

"clear Keyboard" Makes sure the keyboard is clear by reading from keyboard character by character until it reads a new line character.

*Hint: In a loop, keep reading single characters from keyboard until newline character is read (**'\n'**). Then, exit the loop*.

```
void pause(void);
```

Pauses the execution of the application by printing a message and waiting for user to hit <ENTER>.

Print the following line and DO NOT go to newline:

```
>Press <ENTER> to continue...<
```

Then, call clrKyb function.

Here the clrKyb function is used for a fool-proof <ENTER> key entry.

```
int getInt(void);
```

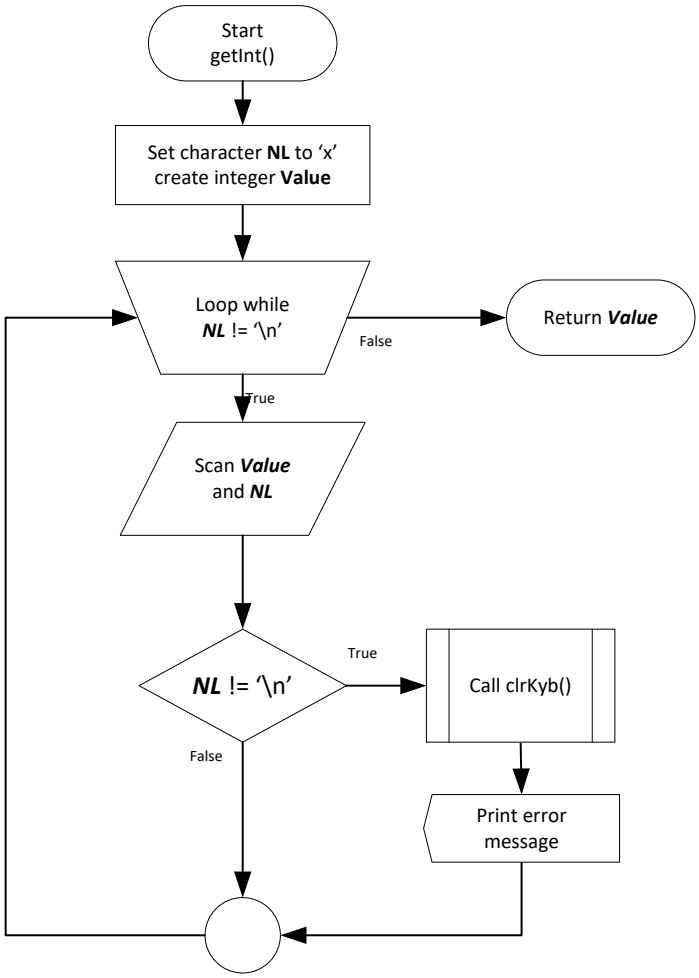
Gets a valid integer from the keyboard and returns it. If the integer is not valid it will print:

```
"Invalid integer, please try again: "
```

and try again.

This function must be fool-proof; it should not let the user pass, unless a valid integer is entered.

Hint: to do this, you can have two variables read back to back by scanf; an integer and then a character (`"%d%c"`) and make sure the second (the character) is new line. If the second character is new line, then this guaranties that first integer is successfully read and also after the integer <ENTER> is hit. If the character is anything but new line, then either the user did not enter an integer properly, or has some additional characters after the integer, which is not good. In this case clear the keyboard, print an error message and scan the integer again. See the flowchart below.



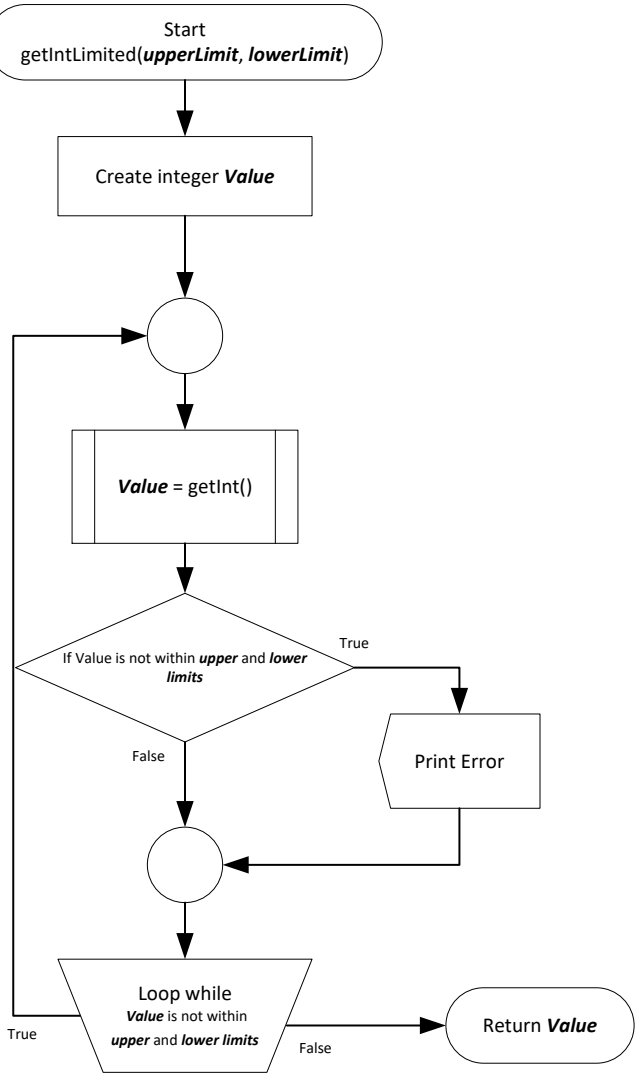

```
int getIntLimited(int lowerLimit, int upperLimit);
```

This function uses getInt() to receive a valid integer and returns it. This function makes sure the integer entered is within the limits required (between ***lowerLimit*** and ***upperLimit*** inclusive). If the integer is not within the limits, it will print:

> `"Invalid value, TheLowerLimmit < value < TheUpperLimit: "` <

and try again. *(Change the lower and upper limit with their values.)*

This function is fool-proof too; the function will not let the user pass until a valid integer is received within the lower and upper limit values. See below:




```
double getDbl(void);
```

Works exactly like ***getInt()*** but scans a double instead of an integer with the following error message:

```
"Invalid number, please try again: "
```

```
double getDblLimited(double lowerLimit, double upperLimit);
```

Works exactly like ***getIntLimited()*** but scans a double instead of an integer.

OUTPUT SAMPLE:

(UNDERLINED, *ITALIC* **BOLD** RED VALUES ARE USER ENTRIES)

```
---=== Grocery Inventory System ===---

listing header and footer with grand total:
Row |SKU| Name               | Price  |Taxed| Qty | Min |   Total    |Atn
----+---+--------------------+--------+-----+-----+-----+------------|---
-------------------------------------------------------+----------------
                                          Grand Total: |     1234.57
listing header and footer without grand total:
Row |SKU| Name               | Price  |Taxed| Qty | Min |   Total    |Atn
----+---+--------------------+--------+-----+-----+-----+------------|---
-------------------------------------------------------+----------------
Press <ENTER> to continue... <ENTER>
Enter an integer: abc
Invalid integer, please try again: 10abc
Invalid integer, please try again: 10
You entered: 10
Enter an integer between 10 and 20: 9
Invalid value, 10 < value < 20: 21
Invalid value, 10 < value < 20: 15
Your entered 15
Enter a floating point number: abc
Invalid number, please try again: 2.3abc
Invalid number, please try again: 2.3
You entered: 2.30
Enter a floating point number between 10.00 and 20.00: 9.99
Invalid value, 10.000000< value < 20.000000: 20.1
Invalid value, 10.000000< value < 20.000000: 15.05
You entered: 15.05
End of tester program for milestone one!
```

MS1 SUBMISSION:

To test and demonstrate execution of milestone 1, use the same data as the output example above.

If not on matrix already, upload your **ipc_ms1.c** to your matrix account. Compile and run your code and make sure everything works properly.

Before submission comment out your main function (the tester) in **ipc_ms1.c**. (Only the 9 functions you implemented are needed for the submission)

Then run the following script from your account: (replace profname.proflastname with your professors's Seneca userid)

~profname.proflastname/submit ipc_ms1 <ENTER>

and follow the instructions.