Lab 2: Console I/O in C

Part I: `sizeof()`, `printf()`, and `scanf()`

For this lab, create a new directory named `lab2` under your `cs449` directory and create your program there.

```
mkdir lab2
cd lab2
```

As weve learned in class, in C the size of data types are not exactly defined. In this lab, you will write a program named `lab2a.c` that displays the size of the various data types. Using the `sizeof()` keyword, determine the size of the following data types:

```
int
short
long
long long
unsigned int
char
float
double
long double
```

Have the output be displayed to the screen in the following tabular (use tabs to align the column of sizes) format:

```
int     4 bytes
short   2 bytes
   :
   :
```

When you are done, we can use a feature of the UNIX shell to submit the output. Text that is displayed to the screen in UNIX can be captured into a file using the `>` (redirection) command.

Run your program like (assuming you named the output file lab2a):

```
./lab2a > lab2a.txt
```

And now the file `lab2a.txt` will contain the output, and the screen will be empty. You can open `lab2a.txt` in `nano` or using `more` to check the output.

Hint:

- Look at your first lab for information on how to compile and run a program

Part II: Simple Cash Register

For this part, you are writing a program that behaves like a very simple cash register. Create a new program called `lab2b.c`. The behavior of your program should be as follows:

1. Ask user how many items he/she wish to enter.
2. Ask for the price of each item.
3. Show summary of the receipt which consists of number of items, sub-total, tax (7%), and total.

For example, suppose a customer wants to check out and she has 5 items and they are $1.99, $3.99, $12.99, $6.99, and $9.99, respectively. When your program runs, it should look like the following:

```
How many items do you wish to enter? : 5
Enter the price of the item number 1: 1.99
Enter the price of the item number 2: 3.99
Enter the price of the item number 3: 12.99
Enter the price of the item number 4: 6.99
Enter the price of the item number 5: 9.99

You have entered 5 items.
The sub-total is $35.95.
The tax is $2.52.
The total is $38.47.
```

Note that the number of items can be one or more items and you program must keep asking for the price (with the correct item number) until all items have been entered. Then show the summary of the receipt.

What to Hand In

First, let us go back up to our cs449 directory:

```
cd ..
```

Now, let us first make the archive. Type your username for the USERNAME part of the filename:

```
tar cvf USERNAME_lab2.tar lab2
```

And then we can compress it:

```
gzip USERNAME_lab2.tar
```

Which will produce a `USERNAME_lab2.tar.gz` file.

If you work on `cs449.cs.pitt.edu` you can skip to the next section. **If you use your own machine, you need to transfer the file to `cs449.cs.pitt.edu` first**. This can simply be done by a command line. For example, assume that your username is `abc123` and you are in the same directory as the file `abc123_lab2.tar.gz`. To transfer the file to `cs449.cs.pitt.edu` use the following command:

```
scp abc123_lab2.tar.gz abc123@cs449.cs.pitt.edu:.
```

The above command will copy the file to your home directory. If you want to copy it to your `private` directory, use the following command:

```
scp abc123_lab2.tar.gz abc123@cs449.cs.pitt.edu:./private/.
```

Copy File to Submission Directory

We will then submit that file to the submission directory:

```
cp USERNAME_lab1.tar.gz /afs/cs.pitt.edu/public/incoming/CS0449/tkosiyat/sec1
```

Once a file is copied into that directory, you cannot change it, rename it, or delete it. If you make a mistake, resubmit a new file with slightly different name, being sure to include your username. For example `USERNAME_lab2_2.tar.gz`. **Check the due date of this lab in our CourseWeb under Labs/Recitations**.