100 pts

Name1: _____

Name2: _____

Class Day / Time: _____

Due Date: _____

Lab #10 – Implementing a Queue

Write a program that implements a queue using a linked-list.

Write functions to implement each of the following tasks.

- **Enqueue**
- **Dequeue**
- **IsEmpty**
- **Front**
- **Size**
- **Clear Queue**

Provide a menu for the user to choose one of these 6 options (error check the input to ensure it is in the proper range). If they choose **enqueue** allow them to enter in a name, gender, and age. If they choose to **dequeue**, let them know all the info about the person who is being removed (if the list is empty, let them know). If they request the **front**, show them whom is at the front of the list. If they choose **size**, tell them how many people are in the list. If they choose **clear queue** → empty the list. **Validate the user input**.

This lab **must** be demonstrated.

Turn in (IN THIS ORDER)

1. This page.
2. Your header file.
3. a listing of main.cpp (conforming to style discussed in class)
4. a listing of your print heading function (should be in a separate file)
5. a listing of your functions (in at least 1 separate file)
6. screen I/O – pasted into a text file within eclipse and output

OUTPUT MESSAGE FORMAT

Check below for a more detailed description of the expected input and output

Invalid command inputs

Out of range error:

**** The number -1 is an invalid entry   ****
**** Please input a number between 0 and 6 ****

Character input:

**** Please input a NUMBER between 0 and 6 ****

Size

For more than one:
There are 2 people in the queue.

For one:
There is one person on the queue.

For an empty queue:
Nobody is in the queue!

Dequeue

If the queue is empty:
Can't DEQUEUE from an empty list!

IsEmpty

For an empty queue:
Yes, the QUEUE is empty.

For a non-empty queue:
The QUEUE is NOT empty.

Front

If the queue is empty:
Nobody in FRONT, the queue is empty!!

Clear Queue

If the queue is empty:

Example Screen Input/Output should be formatted as follows

QUEUE MENU:
1 – ENQUEUE (Add a person)
2 – DEQUEUE (Remove a person)
3 – ISEMPTY   (Is the queue empty?)
4 – FRONT   (Who is in front?)
5 – SIZE   (How many people are there?)
6 – Clear the Queue
0 – Exit

Enter a command? 1
Who would you like to add?   <redisplay menu>
Enter Name: George Boole   Enter a command? 2
Enter Gender: M
Enter Age: 32   DEQUEUEING
                                                      Name: George Boole
                                                      Gender: M
<redisplay menu>   Age: 32
Enter a command? 1

Who would you like to add?   <redisplay menu>
Enter Name: Ada Lovelace   Enter a command? 5
Enter Gender: F
Enter Age: 21   There are 2 people in the queue.

<redisplay menu>   <redisplay menu>
Enter a command? 1   Enter a command? 3

Who would you like to add?   The QUEUE is NOT empty
Enter Name: Grace Hopper
Enter Gender: F
Enter Age: 44   <redisplay menu>
                                                      Enter a command? 4

<redisplay menu>   The first person in the queue is:
Enter a command? 4   Name: Ada Lovelace
                                                      Gender: F
The first person in the queue is: Age: 21
Name: George Boole
Gender: M
Age: 32   <redisplay menu>
                                                      Enter a command? 2

<redisplay menu>   DEQUEUEING
Enter a command? 5   Name: Ada Lovelace
                                                      Gender: F
There are 3 people in the queue.   Age: 21

Enter a command? 5

There is one person in the queue.

<redisplay menu>
Enter a command? 4

The first person in the queue is:
Name: Grace Hopper
Gender: F
Age: 44

<redisplay menu>
Enter a command? 3

The QUEUE is NOT empty.

<redisplay menu>
Enter a command? 2

DEQUEUEING
Name: Grace Hopper
Gender: F
Age: 44

<redisplay menu>
Enter a command? 5

Nobody is in the queue!

<redisplay menu>
Enter a command? 4

Nobody in FRONT, the queue is empty!!

<redisplay menu>
Enter a command? 3

Yes, the QUEUE is empty.

<redisplay menu>
Enter a command? 2

Can't DEQUEUE from an empty list!

<redisplay menu>
Enter a command? 1

Who would you like to add?
Enter Name: Alan Turing
Enter Gender: M
Enter Age: 25

<redisplay menu>
Enter a command? 1

Who would you like to add?
Enter Name: Blaise Pascal
Enter Gender: M
Enter Age: 19

<redisplay menu>
Enter a command? 1

Who would you like to add?
Enter Name: Dog Bert
Enter Gender: M
Enter Age: 3

<redisplay menu>
Enter a command? 6

CLEARING…
Alan Turing
Blaise Pascal
Dog Bert

The queue has been CLEARED!

redisplay menu>
Enter a command? 6

The QUEUE is ALREADY clear!

<redisplay menu>
Enter a command? 8

**** The number 12 is an invalid entry   ****
**** Please input a number between 0 and 6   ****

<redisplay menu>
Enter a command? a

**** Please input a number between 0 and 6 ****

<redisplay menu>
Enter a command? 0