100 pts

Name: _____

Name: _____

Class Day / Time: _____

Due Date: _____

Lab #11 – Creating an Ordered List

Write a program that implements a **doubly linked-list,** which is created alphabetically. Use the input file provided along with the expected screen input/output (also provided) as test data. I will need to demo this lab.

Your program should implement the following functionality and will provide the following options to the user in a list (output is described in the expected input/output section).

OPTION DESCRIPTIONS
1 – CREATE LIST
    Creates a linked list adding each node in alphabetical order.
2 – DISPLAY LIST
    Displays the linked-list in the format described in the expected input/output section.
3 – Is the list empty?
    Provides an appropriate response indicating if the list is empty or not.
4 - Search by name
    Allows the user to input a name and will output the node as described.
5 – Remove Node
    Allows the user to input a name and removes the node from the list.
6 – Clear List
    Delete all the nodes in the linked list.
0 – Exit
    The program will continue to run until the user explicitly requests to exit.

Use an enumerated type for your menu options. Use an input file, but no output file is necessary. Your code will be assessed based on the proper use of functions. Be sure that you are properly using functions you created. Don't re-write code if you already have a function that performs an operation → reuse it. Create your functions such that they are generic, keeping re-use in mind. **Validate the user input**. This lab **must** be demonstrated.
TEST WHAT WILL HAPPEN IF CREATE
 LIST IS EXECUTED MORE THAN 1 TIME.

Turn in (IN THIS ORDER)
1. The first page of this lab.
2. Your header file.
3. a listing of your print heading function (should be in a separate file
4. a listing of main.cpp (conforming to style discussed in class)
5. a listing of your other functions (in some logical order).

This lab needs to be demonstrated for credit. You don't need to print the output.

v.f.11

INPUT FILE:
```
Payne, Royal
M 73

Ding, Bill
M 21

Post, Mark
M 20

Sassin, Anna
F 62

Lear, Shanda
F 18

Longbottom, Iva
F 45

Dwyer, Barb
F 24

Hogg, Ima
F 43

Belcher, Ura
F 46

Age, Sue
F 32
```

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 ****
```

Display List
For an empty list:
```
Yes, the list is empty.
```

For a non-empty list – Display all nodes in the list – a complete list should look like this:
```
   #    NAME                      GENDER    AGE
-------  ------------------------  --------  -----
   1     Age, Sue                     F       32
   2     Belcher, Ura                 F       46
   3     Ding, Bill                   M       21
   4     Dwyer, Barb                  F       24
   5     Hogg, Ima                    F       43
   6     Lear, Shanda                 F       18
   7     Longbottom, Iva              F       45
   8     Payne, Royal                 M       73
   9     Post, Mark                   M       20
  10     Sassin, Anna                 F       62
```

IsEmpty
For an empty list:
```
Yes, the list is empty.
```
For a non-empty list:
```
No, The list is NOT empty.
```

Search By Name
When found:
```
Who would you like to search for?
Age, Sue

Searching for Age, Sue...

Name:     Age, Sue
Gender:   F
Age:      32
```

When not found:
```
Who would you like to search for?
Smith, Will

Searching for Smith, Will...
I'm sorry, "Smith, Will" was NOT
found!
```

Remove Node
When found:
```
Who would you like to remove? Age,
Sue

Searching for Age, Sue...
Removing Age, Sue!
```
When not found:
```
Who would you like to remove?
Smith, Will

Searching for Smith, Will...
I'm sorry, "Smith, Will" was NOT
found!
```

Clear List
If the List is not empty – it should indicate each name as it is being removed.
```
CLEARING LIST:
Removing Belcher, Ura!
Removing Ding, Bill!
Removing Dwyer, Barb!
Removing Hogg, Ima!
Removing Lear, Shanda!
Removing Longbottom, Iva!
Removing Payne, Royal!
```

If the List is empty:
```
The list has been cleared!
```

EXPECTED INPUT/OUTPUT

```
LIST MENU:
1 - Create List
2 - Display List
3 - Is the list empty?
4 - Search by name
5 - Remove Node
6 - Clear List
0 - to Exit
Enter a command (0 to exit): 1

Adding : Payne, Royal
Adding : Ding, Bill
Adding : Post, Mark
Adding : Sassin, Anna
Adding : Lear, Shanda
Adding : Longbottom, Iva
Adding : Dwyer, Barb
Adding : Hogg, Ima
Adding : Belcher, Ura
Adding : Age, Sue


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 2

    #     NAME                          GENDER     AGE
------- --------------------------    --------  -----
    1     Age, Sue                        F         32
    2     Belcher, Ura                    F         46
    3     Ding, Bill                      M         21
    4     Dwyer, Barb                     F         24
    5     Hogg, Ima                       F         43
    6     Lear, Shanda                    F         18
    7     Longbottom, Iva                 F         45
    8     Payne, Royal                    M         73
    9     Post, Mark                      M         20
   10     Sassin, Anna                    F         62


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 3

No, the list is NOT empty.


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 4

Who would you like to search for? Age, Sue

Searching for Age, Sue...

Name:    Age, Sue
Gender:  F
Age:     32
```

```
LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 4

Who would you like to search for? Sassin, Anna

Searching for Sassin, Anna...

Name:    Sassin, Anna
Gender:  F
Age:     62

LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 4

Who would you like to search for? Ding, Bill

Searching for Ding, Bill...

Name:    Ding, Bill
Gender:  M
Age:     21

LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 4

Who would you like to search for? Smith, Will

Searching for Smith, Will...
I'm sorry, "Smith, Will" was NOT found!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 5

Who would you like to remove? Age, Sue

Searching for Age, Sue...
Removing Age, Sue!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 5

Who would you like to remove? Post, Mark

Searching for Post, Mark...
Removing Post, Mark!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 5

Who would you like to remove? Sassin, Anna

Searching for Sassin, Anna...
Removing Sassin, Anna!
```

```
LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 5

Who would you like to remove? Smith, Will

Searching for Smith, Will...
I'm sorry, "Smith, Will" was NOT found!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 6

CLEARING LIST:
Removing Belcher, Ura!
Removing Ding, Bill!
Removing Dwyer, Barb!
Removing Hogg, Ima!
Removing Lear, Shanda!
Removing Longbottom, Iva!
Removing Payne, Royal!

The list has been cleared!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 2

Can't display an empty list


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 3

Yes, the list is empty.


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 4

Can't search an empty list


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 5

Can't remove from an empty list!


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 6

The list has been cleared!
```

```
LIST MENU:
<redisplay menu>
Enter a command (0 to exit): x

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

LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 7

**** The number 7 is an invalid entry      ****
**** Please input a number between 0 and 6   ****


LIST MENU:
<redisplay menu>
Enter a command (0 to exit): -1

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

LIST MENU:
<redisplay menu>
Enter a command (0 to exit): 0
```