Homework #3

Turn In:

1. Exercise #1 – Due in class on xxx, xxx xx, 2018
    a) For each exercise, a hardcopy package must be generated to include the following items:
        - Cover Sheet (use the sample copy include in class/lecture note)
        - Exercise/problem statement
        - Copy of your source file (C program named as **`cis27Spring2018YournameHw3Ex1.c`**)
        - Copy of output (copy and paste to the end of your program as COMMENT block)
        - Copy of **`YOUR_Logic Issues_Code Issues, Output Issues_COMMENTS`** (as a separate comment block) after the PROGRAM_OUTPUT.
    b) Submitting in class one hard copy for each document
    c) Emailing each document as follows,
        - One message for each exercise.
        - Attaching the source file that was created in part a).
        - The SUBJECT line of the message should have one of the following lines:

```
cis27Spring2018YourNameHw3Ex1
```

3. Q.E.D.

****

1. Coding Assignment

Exercise #1

1. You are asked to create/implement a linked list of `Fraction` objects (which are to be elaborated through class meetings/discussions) as indicated below.

   Note!

   - **`Fraction` data/value/object must be declared as a `struct Fraction` of two elements, which are integers of `num` and `denom`.**
   - **These `Fraction` objects must have their negativity to be taken to the numerators (i.e., `num`).**

   The list implementation should include the definitions of the `Fraction` node/element and have, at least, the following functions.

   `Insertion:`

   ```
   insertFirstYourName()
   insertAtYourName()
   appendYourName()
   ```

   `Removal:`

   ```
   removeFirstYourName()
   removeAtYourName()
   removeLastYourName()
   ```

   `Utility:`

   ```
   isEmptyYourName()
   getLengthYourName()
   displayListYourName()
   ```

2. Write a **MENU** program to have the above operations (or more) for a linked list of `Fraction` data/objects. The menu should work just as outlined below.

   Your menu program should not use global data; data should be allowed to be read in and stored dynamically (i.e., provided by the user).

3. Name your program as `cis27Spring2018YourNameHw3Ex1.c`

   Then, test your program with the fractions of

   `{3/4, 5/12, -3/7, 4/9, 2/11, 5/101, 6/17, -8/15}`

   Make sure that the output is reasonable and detailed enough so that the user would understand the list – Use `printf()` measurably.

Remember to attach the output at the end of your source code (as comment).

OUTPUT

```
CIS 27 – Data Structures
Laney College
Your Name

Assignment Information --
  Assignment Number:  Homework 03,
                      Coding Assignment -- Exercise #1
  Written by:         Your Name
  Submitted Date:     Due Date


*****************************
*         Menu HW #3        *
* LINKED LIST MENU: Fraction *
* 1. Displaying current list *
* 2. Inserting              *
* 3. Removing               *
* 4. Quit                   *
*****************************
Select the option (1, 2, 3, or 4): 5

  No Kidding!


*****************************
*         Menu HW #3        *
* LINKED LIST MENU: Fraction *
* 1. Displaying current list *
* 2. Inserting              *
* 3. Removing               *
* 4. Quit                   *
*****************************
Select the option (1, 2, 3, or 4): 1

  EMPTY LIST ...!!!


*****************************
*         Menu HW #3        *
* LINKED LIST MENU: Fraction *
* 1. Displaying current list *
* 2. Inserting              *
* 3. Removing               *
* 4. Quit                   *
*****************************
Select the option (1, 2, 3, or 4): 2

  // Insertion Operations
```

```
**********************
*   Inserting Menu   *
* 1. As first node   *
* 2. After n-th node *
* 3. As last node    *
* 4. Displaying      *
* 5. Returning       *
**********************
Select the option (1, 2, 3, 4 or 5): 1

  // PERFORM AND TEST YOUR FUNCTIONS/OPTIONS

**********************
*   Inserting Menu   *
* 1. As first node   *
* 2. After n-th node *
* 3. As last node    *
* 4. Displaying      *
* 5. Returning       *
**********************
Select the option (1, 2, 3, 4 or 5): 2

  // PERFORM AND TEST YOUR FUNCTIONS/OPTIONS

**********************
*   Inserting Menu   *
* 1. As first node   *
* 2. After n-th node *
* 3. As last node    *
* 4. Displaying      *
* 5. Returning       *
**********************
Select the option (1, 2, 3, 4 or 5): 5

  // Returning to previous menu – Main Menu


******************************
*         Menu HW #3         *
* LINKED LIST MENU: Fraction *
* 1. Displaying current list *
* 2. Inserting               *
* 3. Removing                *
* 4. Quit                    *
******************************
Select the option (1, 2, 3, or 4): 3

  // Removal Operations

      ******************
      *  Removing Menu  *
      * 1. First node   *
      * 2. n-th node    *
      * 3. Last node    *
      * 4. Displaying   *
```

```
* 5. Returning    *
********************
Select the option (1, 2, 3, 4 or 5): 1

  // PERFORM AND TEST YOUR FUNCTIONS/OPTIONS

********************
*  Removing Menu  *
* 1. First node   *
* 2. n-th node    *
* 3. Last node    *
* 4. Displaying   *
* 5. Returning    *
********************
Select the option (1, 2, 3, 4 or 5): 2

  // PERFORM AND TEST YOUR FUNCTIONS/OPTIONS

********************
*  Removing Menu  *
* 1. First node   *
* 2. n-th node    *
* 3. Last node    *
* 4. Displaying   *
* 5. Returning    *
********************
Select the option (1, 2, 3, 4 or 5): 4

  // Displaying your current list

********************
*  Removing Menu  *
* 1. First node   *
* 2. n-th node    *
* 3. Last node    *
* 4. Displaying   *
* 5. Returning       *
**********************
Select the option (1, 2, 3, 4 or 5): 5

  // Returning to previous menu – Main Menu


******************************
*         Menu HW #3         *
* LINKED LIST MENU: Fraction *
* 1. Displaying current list *
* 2. Inserting               *
* 3. Removing                *
* 4. Quit                    *
******************************
Select the option (1, 2, 3, or 4): 4

  Fractions and Linked Lists -- Fun!
```