CSCI 220 -- PA 3

Arrays and Linked Lists

Feel free to discuss and help each other out but does not imply that you can give away your code or your answers! Make sure to read all instructions before attempting this lab. You cannot work with a lab partner for this assignment.

You must use an appropriate provided template from Canvas or my website (zeus.mtsac.edu/~tvo) and output "Author: Your Name(s)" for all your programs. If you are modifying an existing program, use "Modified by: Your Name(s)".

Review arrays and linked lists.

Exercise 1 – Provide an array implementation to maintain a list of names. The following operations are available: insert rear, insert front, remove a particular element, and print the whole list. Do not implement an ADT for this assignment (i.e., do not use a class with data and operations). Just set up a fixed size array of 10 elements (will not insert more than 10 elements) and provide code in main calling functions/static methods to perform insert, remove, and print. You can set up a menu or hard code some test cases to test your implementation. Feel free to use provided code from textbook as the starting point.

```
// setup global/static variables for the array and count

// some operations in main
insertFront("Jo");      // update array and count
insertFront("Jane");
insertRear("John");
insertRear("Kim");
remove("Jo");
print(); // output Jane John Kim
```

Exercise 2 – Provide a linked list implementation to maintain a list of names. The following operations are available: insert rear, insert front, remove a particular element, and print the whole list. Do not implement an ADT for this lab (i.e., do not use a class with data and operations). Just set up a node and use head pointer/reference to maintain a linked list of nodes and provide code in main calling functions/static methods to perform insert, remove, and print. You can set up a menu or hard code some test cases to test your implementation. Feel free to use provided code from textbook as the starting point.

```
// setup Node

// setup global/static variables for head and count
```

```
// some operations in main
insertFront("Jo");      // update linked list and count
insertFront("Jane");
insertRear("John");
insertRear("Kim");
remove("Jo");
print(); // output Jane John Kim
```

Question 1: Which one is easier to implement between array and linked list? Explain.

Question 2: Would it be more efficient to use a doubly linked list instead of a single linked list for the problem above? Explain.

Extra Credit: Add recPrint() operation to both exercises to print the list using a recursive function/method.

```
// call recursive version to print
recPrint(arr, count);   // print array

recPrint(head);         // print linked list
```

Fill out and turn in the PA submission file for this assignment (save as PDF format).