Data Structures

Lab4: Deque

You are asked to implement the Deque ADT using a doubly linked list. Here is the interface to your Deque class:

```cpp
struct DequeNode {
        int item;
        DequeNode *prev, *next;

        DequeNode(int item) {
                this->item = item;
                this->prev = this->next = NULL;
        } //end-DequeNode
};

class Deque {
public:
        DequeNode *head, *tail;
        int noOfItems;
public:
        Deque();
        ~Deque();
        void AddFront(int item);
        void AddRear(int item);
        int RemoveFront();
        int RemoveRear();
        int Front();
        int Rear();
        bool IsEmpty() { return noOfItems == 0; }
        int  Size() { return noOfItems; }
};
```

As you can see, **you must use a doubly-linked list** to implement the Deque and **all operations must run in O(1).**

A base code for the project is given. You are asked to fill-in the Deque class methods defined in Deque.cpp. You should submit just this file, Deque.cpp. You are **NOT** allowed to change the Deque class declaration given in Deque.h.

Main.cpp contains two tests to test your Deque. You are encouraged to implement your own test code. We will add other tests when grading your submissions.