**CS010C Quiz 1: Chapters 1 & 2 Practice Quiz**

*Note: This quiz is much longer than the actual quiz to provide you with various problems for you to practice and understand.*

**Runtime Analysis**

*Please write concise yet clear answers answering the following prompts:*

1. What is the definition of Big O?
2. What does it mean for a function to have a constant runtime?
3. What does it mean for a function to have a linear runtime?
4. What does it mean for a function to have a quadratic runtime?
5. Why is it important to define a custom destructor when dealing with allocated memory?
6. What is the rule of three? What is the purpose of the rule of three?
7. What is the purpose of implementing a dummy head and tail in a doubly linked list?

**Coding Questions**

*Provided the given class, please code the following functions:*

* push\_back
* pop\_front
* ~LinkedList

struct Node {  
 int data;

Node\* prev;

Node\* next;

Node(int value): data(value) {};

};

class LinkedList {  
 private:

Node\* head = new Node(-1);

Node\* tail = new Node(-1);

public:

void push\_back(int);

void pop\_front();

~LinkedList();

};

1. push\_back

void push\_back(int value){

}

1. pop\_front

void pop\_front(){

}

1. ~LinkedList

~LinkedList(){

}

*Please code the following function:*

Given a file name, create a function to open the file, read and print the contents to console and close the file. Ensure to have proper guards and validations!

*For following questions 11 - 12 only implement the function header, you do not need to implement the function definition.*

1. Implement a function header to take in a string and return the number of characters in the string.
2. Implement a function header to take in 2 vectors and return a vector which combines the 2 vectors by creating a new one.