DSA Lab 7

Question 1

1. Implement a template class 'Node' that contains three data members: A template variable '**data**', a Node pointer '**next**', and another node pointer '**prev**'. You may define any member functions, if required, for this template class.

2. Now using the above class, implement a **doubly** linked list using **dummy head** and **tail** pointers which supports the following operations:
   a. Insert at start: `void insertAtStart(Tconst element)`
   b. Insert at end: `void insertAtEnd(Tconst element)`
   c. Delete from Start: `void DeleteAtStart();`
   d. Delete from end: `void DeleteAtEnd();`
   e. Print: `void print() const;`
   f. Reverse all elements of linked list: `void reverse()`
   g. Insert a value at the middle of the list using only a single non-nested loop: `void insertAtMiddle(T const element)`
   h. remove all duplicate values: `void removeDuplicates()`
   i. Insert value v1 before value v2: `bool insertBefore(T const v1, T const v2) const`
   j. Destructor

3. Now create a main function which has the following instructions:
   a. Define a doubly linked list object of type int.
   b. Insert 7 and 9 at end.
   c. Insert 9 at start.
   d. Now insert 10, and 9 at end.
   e. Insert 15 at the middle.
   f. Now print the linked list.
   g. Remove all duplicate values.
   h. Insert 6 before 11.
   i. Print the linked list.
   j. Reverse all elements of linked list.
   k. Now print the linked list.