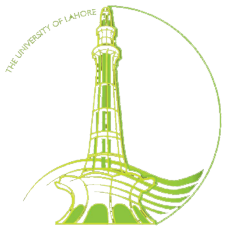

THE UNIVERSITY OF LAHORE
ISLAMABAD CAMPUS

Data Structures and Algorithms
(CS09203)

Lab Report

Name:	Muntaham Inaam Hashmi
Registration #:	SEU-F16-142
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Submitted To:	Sir. Usman Ahmed

The University of Lahore, Islamabad Campus
Department of Computer Science & Information Technology

Experiment # 6
Double Link list-Basic Insertion

Objective
The objective of this session is to understand the Double linked list in C++. using C++..

Software Tool
1. I use Code Blocks with GCC compiler.

1 Theory

DOUBLE LINKED LIST:- A linked list is a collection of components, called nodes. Every node (except the last node) contains the address of the next node. Thus, every node in a linked list has two components: one to store the relevant information (that is, data) and one to store the address, called the link, of the next node in the list. The address of the first node in the list is stored in a separate location, called the head or first. Figure 1 is a pictorial representation of a node. In a double link list we are given with the previous index and next index and in the middle we have a value stored at previous address and in double link list we can move forward and backward the very first nodethe previous address is empty because it shows the starting point and at the last node the next address is also empty which shows that the link list is ended here.

2 Task

2.1 Procedure: Task 6

Write a C++ code using functions for: 1.Creating a double linked List.

2.2

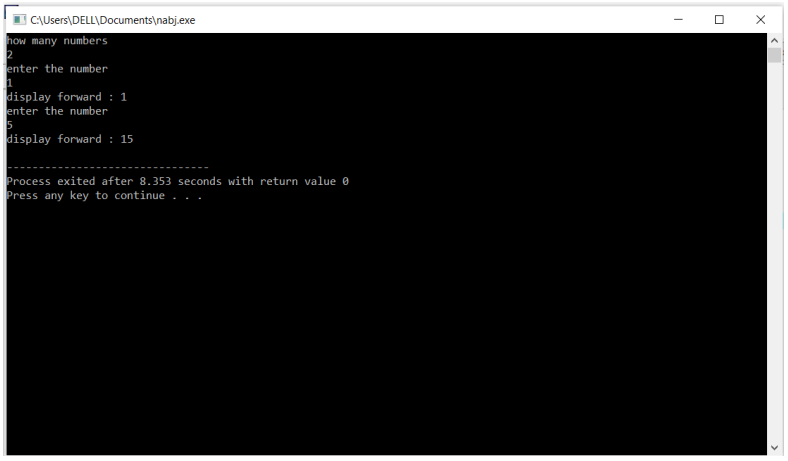

Figure 1: output

```
#include<stdlib.h>
#include<iostream>
using namespace std;

struct Node  {
        int data;
        struct Node* next;
        struct Node* prev;
};

struct Node* head;
struct Node* GetNewNode(int x) {
        struct Node* newNode
                = (struct Node*)malloc(sizeof(struct Node));
        newNode->data = x;
        newNode->prev = NULL;
        newNode->next = NULL;
        return newNode;
}

void InsertAtHead(int x) {
        struct Node* newNode = GetNewNode(x);
        if(head == NULL) {
```

```
                head = newNode;
                return;
        }
        head->prev = newNode;
        newNode->next = head;
        head = newNode;
}

void InsertAtTail(int x) {
        struct Node* temp = head;
        struct Node* newNode = GetNewNode(x);
        if(head == NULL) {
                head = newNode;
                return;
        }
        while(temp->next != NULL) temp = temp->next;
        temp->next = newNode;
        newNode->prev = temp;
}

void Print() {
        struct Node* temp = head;
        cout<<"display forward : ";
        while(temp != NULL) {
                cout<<temp->data;
                temp = temp->next;
        }
        cout<<"\n";
}


int main() {


        head = NULL;

        cout<<"how many numbers"<<endl;
        int n,i,x,y;
        cin>>n;
        for(i=0;i<n;i++){
```

```
            cout<<"enter the number"<<endl;
            cin>>x;

    InsertAtTail(x); Print();


}}
```

3 Conclusion

In today lab we have discussed how we can create double link list .