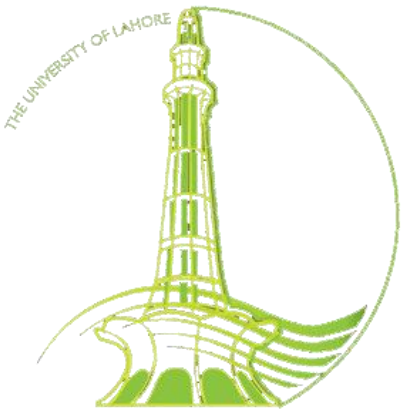

THE UNIVERSITY OF LAHORE
ISLAMABAD CAMPUS

Data Structures and Algorithms
(CS09203)

Lab Report

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Lab Report: 6
Submitted To: Sir, Usman Ahmed

Lab: 6

Doubly Linked list

Objective

Understanding how to insert and traverse data elements in doubly link list

Software Tool

- Windows 7 64-Bit
- Dev C++
- Ms Office 2007

1 Theory

A doubly linked list is a list that contains links to next and previous nodes. Unlike singly linked lists where traversal is only one way, doubly linked lists allow traversals in both ways.

```
struct node
{
    int data;
    node* prev;
    node* next;
};
```

2 Task

2.1 Procedure: Task 1

In this we enter data into link list and it create Nodes. A nodes has three parrts in doubly link which have a previous address, data next address. In this task we first enter the node and put elements to it and then traverse them by doubly link list.

3 Conclusion

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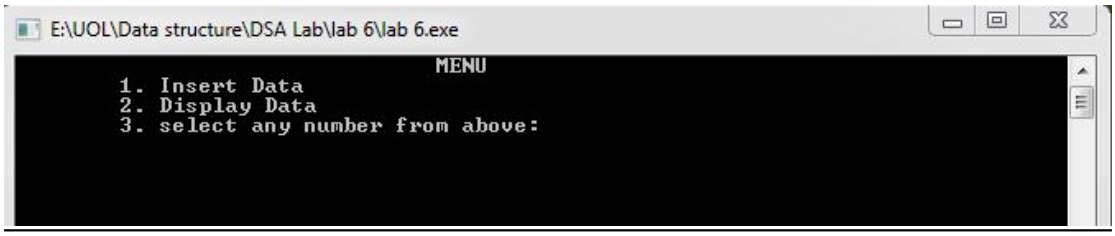
Performing operation with Doubly link list

Code:

```
#include<iostream>
#include<stdlib.h>
#include<conio.h>
using namespace std;
struct node{
	int data;
	node* prev;
	node* next;
};

node* head = NULL;

node* getNewNode(int item){
	node* newNode = (node*)malloc(sizeof(node));
	(*newNode).data = item;
	(*newNode).prev = NULL;
	(*newNode).next = NULL;
	return newNode;
}

void insert(node* newNode){
	node* last_node = (node*)malloc(sizeof(node));
	last_node = head;
	head = newNode;
	newNode -> prev = NULL;
	newNode -> next = last_node;
	cout<<"\n\nData Entered Press Enter to add more:";
	getch();
	return;
}

void display(){
	node* newNode = (node*)malloc(sizeof(node));
	newNode = head;
	cout<<"\n\nlist is:\n\n";
	while(newNode != NULL){
		cout<<newNode -> data<<" ";
		newNode = newNode -> next;
	}

	getch();
	return;
}
```

```
int main(){
	int opt, num;
	node* newNode;
	up:
	system("cls");
	cout<<"\t\t\t\tMENU\n";
	cout<<"\t1. Insert Data\n";
	cout<<"\t2. Display Data\n";
	cout<<"\t3. select any number from above:";
	cin>>opt;
	if(opt == 1){
		cout<<"\n\nEnter Numbers to insert:";
		cin>>num;
		newNode = getNewNode(num);
		insert(newNode);
		goto up;
	}
	else if(opt == 2){
		display();
		goto up;
	}
	else if(opt == 3){
		exit(0);
	}
	else{
		cout<<"\n\nError!";
		cout<<"\n\nPress Enter:";
		getch();
		goto up;
	}
	return 0;
}
```

Output:




E:\UOL\Data structure\DSA Lab\lab 6\lab 6.exe
MENU
1. Insert Data
2. Display Data
3. select any number from above:1
Enter Numbers to insert:3
Data Entered Press Enter to add more:


E:\UOL\Data structure\DSA Lab\lab 6\lab 6.exe
MENU
1. Insert Data
2. Display Data
3. select any number from above:2
list is:
3 2 1