



THE UNIVERSITY
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**ISLAMABAD
CAMPUS**

DATA STRUCTURE

Lab Report

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Lab Report #: 05
Dated: 25-04-2018
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Experiment # 1

LINK LIST

Objective

To understand and implement the LINK LIST .

Software Tool

1.DEV c++

1 Theory

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

Linked list: A list of items, called nodes, in which the order of the nodes is determined by the address, called the link, stored in each node. The arrow in each node indicates that the address of the node to which it is pointing is stored in that node. The down arrow in the last node indicates that this link field is NULL.

2 Task

2.1 Procedure: Task 1

```
#include<iostream>
#include<stdio.h>
#include<stdlib.h>
using namespace std;
struct Node{
    int data;
```

```

        struct Node* next;

    };
    struct Node* head;
    void Insert(int x)
    {
        struct Node* temp=(Node*) malloc(sizeof(struct Node));
        temp->data=x;
        temp->next=head;
        head=temp;
    }
    void print()
    {
        struct Node* temp=head;
        cout<<" List is ";
        while(temp!=NULL)
        {
            cout<<" " <<temp->data;
            temp=temp->next;
        }
        cout<<" \n ";
    }
    void Delete(int n)
    {
        struct Node* temp1=head;
        if(n==1)
        {
            head=temp1->next;
            free(temp1);
            return;
        }
        int i;
        for(i=0;i<n-2;i++)
        {
            temp1=temp1->next;
        }
        struct Node* temp2=temp1->next;
        temp1->next=temp2->next;
        free(temp2);
    }

```

```

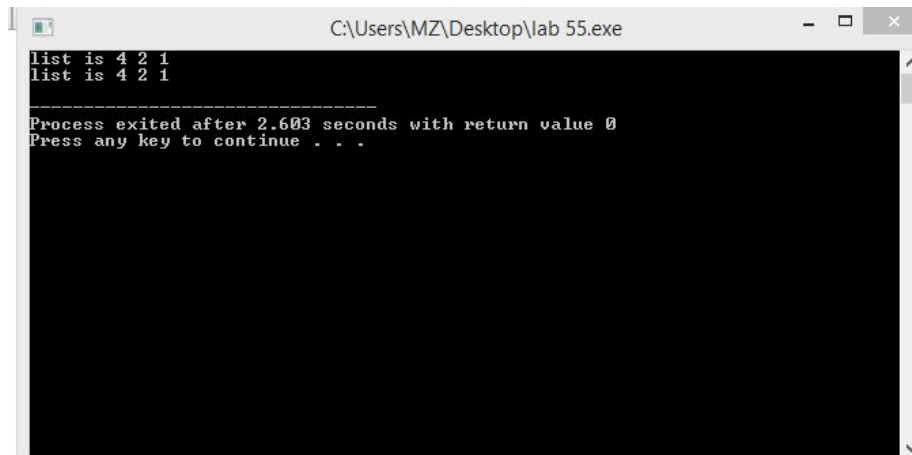
int main()
{
    head = NULL;
    cout<<" Input _The_Numbers_You_Want_to_Add_In_List:_ ";
    int n,i,x,y;
    cin>>n;
    for ( i=0;i<n;i++)
    {
        cout<<" Enter_the_"<<i<<" _Number"<<endl;
        cin>>x;
        Insert(x);
        print();
        cout<<endl;
    }
    cout<<" Enter_Number_You_Want_To_Delete:_ ";
    cin>>y;
    Delete(y);
    print();
    return 0;
}

```

3 Conclusion

In this lab we learn about the application of link list and also how it works and got the idea about the link list and perform them practically on computer in C++

4 OUTPUT



```
C:\Users\MZ\Desktop\lab 55.exe
list is 4 2 1
list is 4 2 1
-----
Process exited after 2.603 seconds with return value 0
Press any key to continue . . .
```