DATA STRUCTURE

Lab Report

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Experiment # 1
LINK LIST

Objective
To understand and implement the LINK LIS T .

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<stdlib.h>
#include<conio.h>
using namespace std;

struct node{
```

```cpp
        int data;
        node* next;
};

node* head = NULL;

void insert(int item){
        node *NewNode = (node*) malloc(sizeof(node));
        NewNode -> data = item;
        NewNode -> next = head;

        head = NewNode;
        cout<<"\n\nData Inserted";
        cout<<"\n\nPress any key to continue...";
        getch();
}


void display(){
        if(head == NULL){
                cout<<"\n\nError: Empty List!";
                cout<<"\n\nPress any key to continue...";
                getch();
                return;
        }
        node *NewNode = (node*) malloc(sizeof(node));
        NewNode = head;
        cout<<"\n\nData in the List:\n\n";
        while(NewNode != NULL){
                cout<<NewNode -> data<<" ";
                NewNode = NewNode -> next;
        }
        cout<<"\n\nPress any key to continue...";
        getch();
}

int main(){
        int choice, item, position;
        up:
        system("cls");
```

```cpp
            cout<<"\n\n\tCHOOSE from below";
            cout<<"\n\n\t1. Insert Data";
            cout<<"\n\t2. Display Data";

            cout<<"\n\t4. Exit\n\n\t";
            cin>>choice;
            if(choice == 1){
                    cout<<"\n\nEnter a value: ";
                    cin>>item;
                    insert(item);
                    goto up;
            }
            else if(choice == 2){
                    display();
                    goto up;
            }
            else if(choice == 4){
                    exit(0);
            }
            else{
                    cout<<"\n\nWRONG CHOICE!";
                    cout<<"\n\nPress any key to choose again...";
                    getch();
                    goto up;
            }
            return 0;

}
```
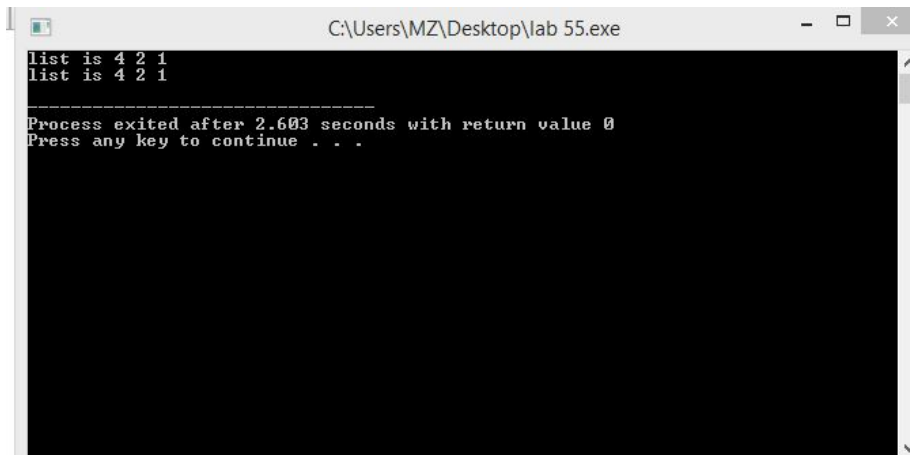
3 Conclusion

In this lab we learn about the application of link list and alo how it work and got the idea about the link list and perform them prectcaly on computer in c++

4 OUTPUT

```
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 . . .
```

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