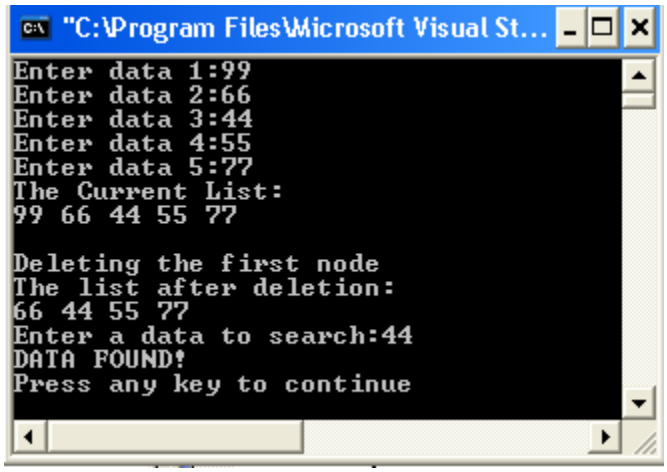
NOTE:
- Create a folder to save your works. Name the folder appropriately (e.g. Lab 2)
- Use comment // to write your name, ID, Group and Lab Question in each program.
- Save your file as .cpp (programming) and word document (diagram).
- Submission depending on your lecturer's instruction

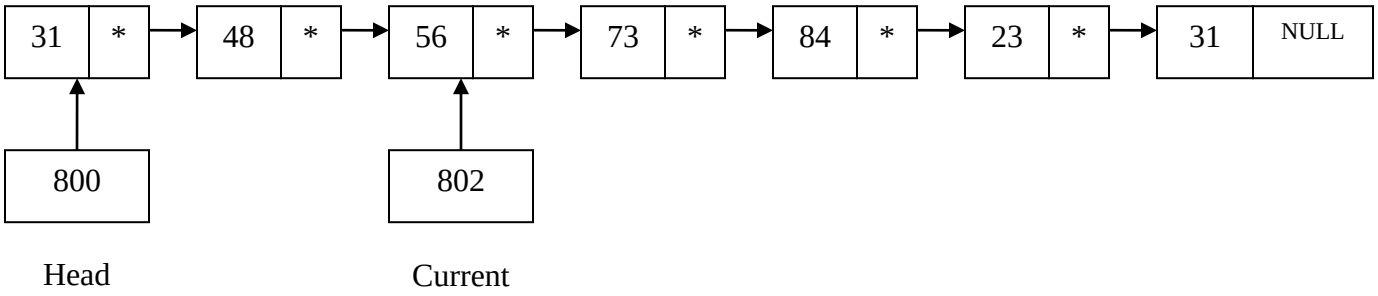
Lab 5: Linked list

1. Write a program where you have to create a linked list with 6 nodes.
   a. Get 6 integers from user and insert it into the linked list.
   b. Then display the list.
   c. After displaying the original list, delete the first node and display the list again.
   d. Prompt the user to enter a data to search in the list. If the data is in the list, display the message ***"DATA FOUND!"***. If not, display the message ***"DATA NOT FOUND!"*** Below is the sample screen of the output:-

Sample Output



2. Refer to figure below:



Complete the table below by writing the value for each of the following statements:

	Value
Head	
Head -> Next	
Head -> Next -> Next -> Next -> Data	
Current -> Next -> Data	
Current -> Next -> Next -> Next -> Next	
Current -> Next -> Next -> Data	
Current -> Next -> Next -> Next -> Next -> Data	

3. Table below represents an array implementation of a linked list.

Index	**Data**	**Link**
0	65	
1	78	
2	33	
3	44	
4	55	
5	39	
6	52	

i) Taking 0 as the start of the list and 99 as a dummy representing the end of the file, fill in the link for all the elements in table to maintain a list of the following order.
65 33 39 52 78 55 44

ii) Based on the answer in question b (i), draw an updated table after data 40 is added between data 39 and 52.

iii) Based on answers in question b(ii), draw an updated table after data 78 is deleted.

4. Show and draw the trace diagram from the following C++ codes. Assume that the node consists of two members, data and next with the data of the type int (list and ptr are pointers of the type node).

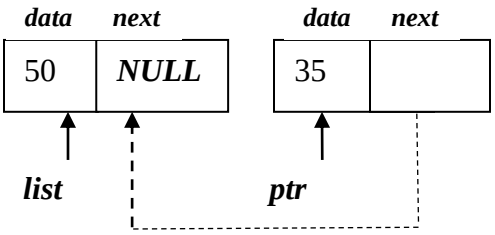
```
i)      ptr=new node;
ii)     ptr->data=28;
iii)    ptr->next=NULL;
iv)     list = new node;
v)      list->data=56;
vi)     list->next=ptr;
vii)    ptr=new node;
viii)   ptr->data=68;
ix)     ptr->next=list;
x)      list=ptr;
xi)     ptr=new node;
xii)    ptr->data=62;
xiii)   ptr->next=list->next;
xiv)    list->next=ptr;
xv)     ptr=list;
xvi)    ptr=new node;
xvii)   ptr->data=70;
xviii)  ptr->next=list->next;
xix)    list->next=ptr;
xx)     ptr=list;
xxi)    while(ptr!=NULL)
        {
            cout<<ptr->data<<endl;
            ptr=ptr->next;
        }
```

5. Write a sequence of C++ programming codes based on the diagram given. Assume that the node consists of two members, ***data*** and ***next*** which are data type integer and node pointer respectively.

Figure 2

```
#include<iostream.h>
struct node
{
      int data;
      node *next;
}ptr,list;
```

i. Link the node 35 to the node 50.



ii. Link the node 28 to the node 50.