EXPERIMENT-7

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Subject Name: DSA Subject Code: CSH-241

1. Aim/Overview of the practical:

   Write a menu driven program to perform different operations on Linked List.

2. Task to be done:

   Linked list is collection of nodes storing data items and links to other nodes.
   Operations on Linked List:

   - Traversing
   - Insertion
   - Deletion

3. Algorithm/Flowchart:

   - Algorithm for traversing

     Step 1: SET PTR=HEAD

     Step 2: IF PTR=NULL
     Write “EMPTY LIST” go to Step 7End

     if

     Step 4: REPEAT STEP 5 AND 6 UNTIL PTR != NULLStep 5:

     PRINT PTR→ DATA

     Step 6: PTR = PTR → NEXT

   [END OF LOOP]

   Step 7: EXIT

- Algorithm for insertion

```
If (ptr == NULL) {
printf("\nOVERFLOW\n");
}

else
{ ptr->data = item; ptr->next =
head; head = ptr;
printf("\nNode is inserted\n");
}
```

- Algorithm for deletion

```
void deletion() { struct
node *ptr; if(head ==
NULL) {
printf("Underflow");
  }
 else { ptr = head;
 head = ptr->next;
 free(ptr);
 printf("\n Node deleted from the begining "); }}
```

4. Code and Output:

```
#include<stdio.h>
#include<stdlib.h>
void insertion(int);
void traverse(); void
```

```
deletion(); struct
node
{ int data; struct
    node *next;
};    struct    node
*head;  void  main
()
{ int ch,item;
    while(1)
    {   printf("*******LINKED LIST OPERATIONS*********");
        printf("\n1.Insertion\n2.Traverse\n3.Deletion\n4.Exit")
        ; printf("\nEnter your choice:"); scanf("%d",&ch);
        switch(ch)
        {

            case 1:
            printf("Enter      the      element:");
            scanf("%d",&item); insertion(item);
            break; case 2:
            traverse();
            break;
            case 3:
```

```
            deletion();
            break; case
            4:
            exit(0);
            default:
            printf("\nInvalid choice!!!try again!!\n");
        }
    } } void
insertion(int item)
    { struct node *ptr = (struct node *)malloc(sizeof(struct node *));
        if(ptr == NULL)

        { printf("\nOVERFLOW\n");
        }
        else
        { ptr->data = item; ptr->next =
            head;       head       =       ptr;
            printf("\nNode is inserted!!\n");
        }
    } void
traverse()
```

```
{ struct node *ptr;
    ptr = head;
    if(ptr ==
    NULL)
    { printf("Empty list");
    }
    else
    {
        printf("Values in Linked List are:\n");

        while (ptr!=NULL)
        { printf("\n%d\n",ptr->data);ptr =
            ptr -> next;
        }
    }
 }

void deletion()
  {  struct  node  *ptr;
    if(head == NULL)
    { printf("\nUNDERFLOW");
```

```
}

else
{ ptr = head; head =
    ptr->next;
    free(ptr); printf("\n Node deleted from the
    begining!");
 } }
```

```
*******LINKED LIST OPERATIONS*********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:1
Enter the element:9

Node is inserted!!
*******LINKED LIST OPERATIONS*********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:1
Enter the element:7

Node is inserted!!
*******LINKED LIST OPERATIONS*********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:1
Enter the element:5

Node is inserted!!
```

```
*******LINKED LIST OPERATIONS*********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:2
Values in Linked List are:

5

7

9
*******LINKED LIST OPERATIONS*********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:3

 Node deleted from the begining!*******LINKED LIST OPERATIONS***
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:2
Values in Linked List are:

7

9
```

```
*******LINKED LIST OPERATIONS**********
1.Insertion
2.Traverse
3.Deletion
4.Exit
Enter your choice:4
```

Learning outcomes (What I have learnt):

- I have learnt about Data Structures.
- I have learnt about application of Data Structures.
- I have about Linked List.
- I have learnt about different operations performed on Linked List.

Evaluation Grid (To be created as per the SOP and Assessment guidelines by the faculty):

Sr. No.	Parameters	Marks Obtained	Maximum Marks
1.	PERFORMANCE		12
2.	WORKSHEET		08
3.	VIVA		10