1. Traverse

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
   int data;
   struct node *next;
};
int main()
{
   struct node *s, *p, *q;
   int ch;
   p = (struct node *)malloc(sizeof(struct node));
   printf("Enter data of first node: ");
   scanf("%d", &p->data);
   s = p;
   do
   {
      q = (struct node *)malloc(sizeof(struct node));
      printf("\nEnter data of next node: ");
      scanf("%d", &q->data);
      p->next = q;
      p = q;
      printf("press 1 to add next node: ");
      scanf("%d", &ch);
      ;
```

```
    }while (ch == 1);


    p->next = NULL;
    printf("\nLinked list: ");
    while (s != NULL)
    {

        printf(" %d ", s->data);
        s = s->next;
    }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR

PS D:\Atharv\Desktop\Programming Sem-3> cd "d:\Atharv\Desktop\Programming Sem-3\DS
($?) { .\LinkedListTraversal }
Enter data of first node: 5

Enter data of next node: 21
press 1 to add next node: 1

Enter data of next node: 3
press 1 to add next node: 1

Enter data of next node: 47
press 1 to add next node: 0

Linked list:  5  21  3  47
PS D:\Atharv\Desktop\Programming Sem-3\DSA\Practical 3>
```

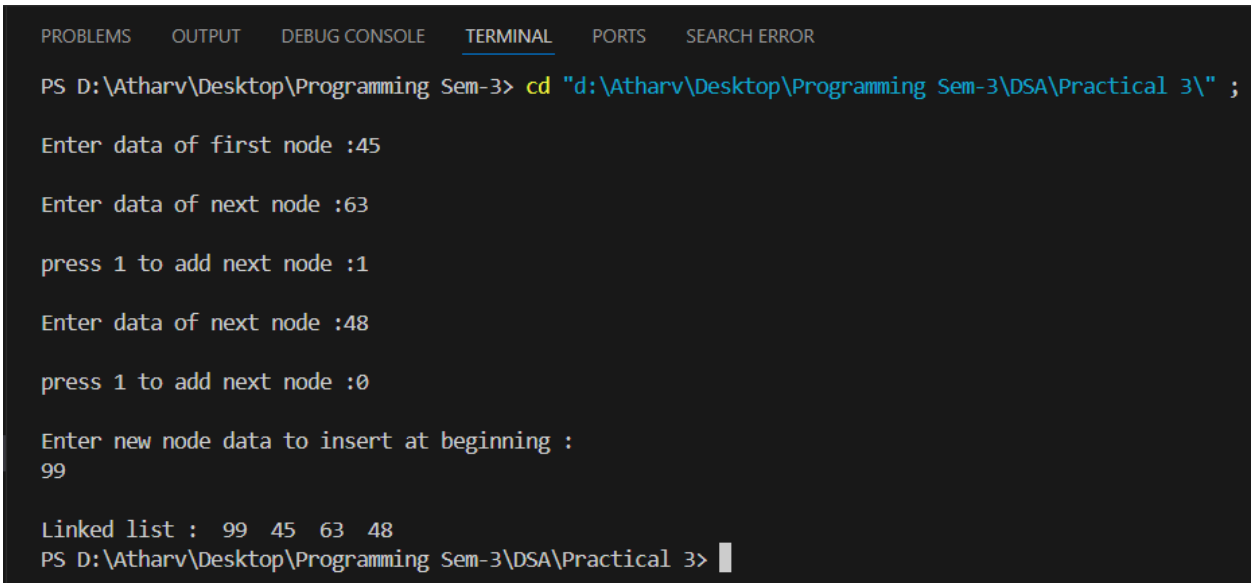
2. Insert at Beginning

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
   int data;
   struct node *next;
};
int main()
{
   struct node *s, *p, *q;
   int ch;
   p = (struct node *)malloc(sizeof(struct node));
   printf("\nEnter data of first node :");
   scanf("%d", &p->data);
   s = p;
   do
   {
      q = (struct node *)malloc(sizeof(struct node));
      printf("\nEnter data of next node :");
      scanf("%d", &q->data);
      p->next = q;
      p = q;
      printf("\npress 1 to add next node :");
```

```
    scanf("%d", &ch);
    ;
  } while (ch == 1);

  p->next = NULL;
  struct node *a;
  a = (struct node *)malloc(sizeof(struct node));
  printf("\nEnter new node data to insert at beginning :\n");
  scanf("%d", &a->data);
  a->next = s;
  s = a;
  printf("\nLinked list : ");
  while (s != NULL)
  {

    printf(" %d ", s->data);
    s = s->next;
  }
}
```



3. Insert at End

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
   int data;
   struct node *next;
};
int main()
{
   struct node *p, *q, *s, *first;
   int ch;
   p = (struct node *)malloc(sizeof(struct node));
   printf("Enter first node data :");
```

```
scanf("%d", &p->data);
s = p;  // s points to the first node
first = s; // first keeps track of the start of the list
do{
   q = (struct node *)malloc(sizeof(struct node));
   printf("Enter next node data :");
   scanf("%d", &q->data);
   p->next = q;
   p = q;
   printf("\npress 1 for next node :");
   scanf("%d", &ch);
}while (ch == 1);
p->next = NULL;
// Insert a node at the end
struct node *a;
a = (struct node *)malloc(sizeof(struct node));
printf("\nEnter node data to insert at end :");
scanf("%d", &a->data);
while (s->next != NULL)
{
   s = s->next;
}
s->next = a;
a->next = NULL;
s = first;
printf("\nLinked list : ");
```

```
    while (s != NULL)
    {
        printf(" %d ", s->data);
        s = s->next;
    }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR

PS D:\Atharv\Desktop\Programming Sem-3\DSA\Practical 3> cd "d:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4\"
 { .\InsertEnd }
Enter first node data :4
Enter next node data :12

press 1 for next node :1
Enter next node data :98

press 1 for next node :0

Enter node data to insert at end :56

Linked list:  4  12  98  56
PS D:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4>
```

4. Delete at Beginning

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
    int data;
    struct node *next;
};
int main()
{
    struct node *s, *p, *q, *first;
    char ch;
    p = (struct node *)malloc(sizeof(struct node));
```

```
printf("Enter first node data : ");
scanf("%d", &p->data);
s = p;
// s points to the first node
first = s;
// first keeps track of the start of the list
do
{
   q = (struct node *)malloc(sizeof(struct node));
   printf("Enter next node data : ");
   scanf("%d", &q->data);
   p->next = q;
   p = q;
   printf("\npress 1 for next node : ");
   scanf("%d", &ch);
}while (ch == 1);
p->next = NULL;
if (s == NULL)
{
   printf("Underflow");
}
s = first;
first = first->next;
free(s);
s = first;
printf("\nLinked list after deleting 1st node: ");
```

```
    while (s != NULL)
    {
        printf(" %d ", s->data);
        s = s->next;
    }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR

PS D:\Atharv\Desktop\Programming Sem-3> cd "d:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4\"
Enter first node data : 6
Enter next node data : 41

press 1 for next node : 1
Enter next node data : 57

press 1 for next node : 1
Enter next node data : 95

press 1 for next node : 1
Enter next node data : 32

press 1 for next node : 0

Linked list after deleting 1st node:  41  57  95  32
PS D:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4>
```

5. Delete at End

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
    int data;
    struct node *next;
};
int main()
{
```

```
struct node *s, *p, *q, *first;
int ch;
p = (struct node *)malloc(sizeof(struct node));
printf("Enter first node data : ");
scanf("%d", &p->data);
s = p;
// s points to the first node
first = s;
// first keeps track of the start of the list
do
{
   q = (struct node *)malloc(sizeof(struct node));
   printf("Enter next node data : ");
   scanf("%d", &q->data);
   p->next = q;
   p = q;
   printf("\npress 1 for next node : ");
   scanf("%d", &ch);
}while (ch == 1);
p->next = NULL;
while (s->next != NULL)
{
   p = s;
   s = s->next;
}
p->next = NULL;
```

```
    free(s);
    s = first;
    printf("\nLinked List after deleting last node: ");
    while (s != NULL)
    {
        printf(" %d ", s->data);
        s = s->next;
    }
}
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS  SEARCH ERROR

PS D:\Atharv\Desktop\Programming Sem-3> cd "d:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4\" ;
Enter first node data : 74
Enter next node data : 12

press 1 for next node : 1
Enter next node data : 64

press 1 for next node : 1
Enter next node data : 84

press 1 for next node : 1
Enter next node data : 24

press 1 for next node : 0

Linked List after deleting last node:  74  12  64  84
PS D:\Atharv\Desktop\Programming Sem-3\DSA\Practical 4>
```

6. Delete at any position

```
#include<stdio.h>
#include<stdlib.h>
struct node{
int data;
struct node * next;
};
int main()
```

```
{
struct node *s,*p,*q,*first;
int ch;
int key;
p=(struct node *)malloc(sizeof(struct node));
printf("Enter first node data : ");
scanf("%d",&p->data);
s=p;
// s points to the first node
first =s ;
// first keeps track of the start of the list
do{
q=(struct node *)malloc(sizeof(struct node));
printf("Enter next node data : ");
scanf("%d",&q->data);
p->next=q;
p=q;
printf("\npress 1 for next node : ");
scanf("%d",&ch); }while(ch==1);
p->next=NULL;
printf("Enter data of node to delete : ");
scanf("%d",&key);
while(s->data!=key)
{
p=s;
s=s->next;
```

```
}
p->next=s->next;
free(s);
s=first;
printf("\nLinked list after deleting node of given data: ");
while(s!=NULL)
{
printf(" %d ",s->data);
s=s->next;
}
}
```