

DATA STRUCTURE – 1

LAB-4

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Initialize and declaration in Double link list:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //creation of double Linked List
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len;
16     struct node* head;
17     struct node* temp;
18     head=(struct node*)malloc(sizeof(struct node));
19     temp=malloc(sizeof(struct node));
20     temp=head;
21     printf("Creation of double linked list\n Enter the size in linked list: \n");
22     scanf("%d",&num);
23     temp->prev=NULL;
24     for(i=0;i<num;i++)
25     {
26         printf("element %d: ",i);
27         scanf("%d",&number);
28         temp->data=number;
29         if(i!=num-1)
30         {
31             temp->next=malloc(sizeof(struct node));
32             temp->next->prev=temp;
33             temp=temp->next;
34         }
35     }
36     temp->next=NULL;
37     while(head!=NULL)
38     {
39         printf("%d->",head->data);
40         head=head->next;
41     }
42     printf("NULL\n");
43     return 0;
44 }
```

Output:

```
input
Creation of double linked list
Enter the size in linked list:
4
element 0: 1
element 1: 2
element 2: 3
element 3: 4
1->2->3->4->NULL
```

Insertion at beginning:

Program:

```
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //insertion in beginning of double Linked List
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len,newnum;
16     struct node* head;
17     struct node* temp;
18     struct node* newnode;
19     struct node* Firstnode;
20     head=(struct node*)malloc(sizeof(struct node));
21     temp=malloc(sizeof(struct node));
22     temp=head;
23     printf("Enter the size in linked list: \n");
24     scanf("%d",&num);
25     temp->prev=NULL;
26     newnode=malloc(sizeof(struct node));
27     for(i=0;i<num;i++)
28     {
29         printf("element %d: ",i);
30         scanf("%d",&number);
31         temp->data=number;
32
33         if(i!=num-1)
34         {
35             temp->next=malloc(sizeof(struct node));
36             newnode=temp;
37             temp=temp->next;
38             temp->prev=newnode;
39         }
40         temp->next=NULL;
41         printf("Enter the element to begin: ");
42         scanf("%d",&newnum);
43         Firstnode=malloc(sizeof(struct node));
44         Firstnode->data=newnum;
45         Firstnode->prev=NULL;
46         head->prev=Firstnode;
47         Firstnode->next=head;
48         head=Firstnode;
49         while(head!=NULL)
50         {
51             printf("%d->",head->data);
52             head=head->next;
53         }
54         printf("NULL\n");
55
56         printf("NULL\n");
57         return 0;
58     }
```

Output:

```
input
Enter the size in linked list:
5
element 0: 1
element 1: 2
element 2: 3
element 3: 4
element 4: 5
Enter the element to begin: 0
0->1->2->3->4->5->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```

Insertion at end:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //insertion in end of double Linked List
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len,newnum;
16     struct node* head;
17     struct node* temp;
18     struct node* newnode;
19     struct node* Lastnode;
20     head=(struct node*)malloc(sizeof(struct node));
21     temp=malloc(sizeof(struct node));
22     temp=head;
23     printf("Enter the size in linked list: \n");
24     scanf("%d",&num);
25     temp->prev=NULL;
26     newnode=malloc(sizeof(struct node));
27     for(i=0;i<num;i++)
28     {
29         printf("element %d: ",i);
30         scanf("%d",&number);
31         temp->data=number;
32         if(i!=num-1)
33         {
34             temp->next=malloc(sizeof(struct node));
35             newnode=temp;
36             temp=temp->next;
37             temp->prev=newnode;
38         }
39     }
40     printf("Enter the element to end: ");
41     scanf("%d",&newnum);
42     Lastnode=malloc(sizeof(struct node));
43     Lastnode->data=newnum;
44     Lastnode->next=NULL;
45     Lastnode->prev=temp;
46     temp->next=Lastnode;
47     while(head!=NULL)
48     {
49         printf("%d->",head->data);
50         head=head->next;
51     }
52     printf("NULL\n");
53     return 0;
54 }
```

Output:

```
input
Enter the size in linked list:
4
element 0: 1
element 1: 2
element 2: 3
element 3: 4
Enter the element to end: 5
1->2->3->4->5->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```

Inserting at specific position:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //insertion in specific position of double linked list
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len,newnum,newpos;
16     struct node* head;
17     struct node* temp;
18     struct node* newnode;
19     struct node* Middlednode;
20     struct node* temp2;
21     head=(struct node*)malloc(sizeof(struct node));
22     Middlednode=(struct node*)malloc(sizeof(struct node));
23     temp=malloc(sizeof(struct node));
24     temp2=(struct node*)malloc(sizeof(struct node));
25     temp=head;
26     printf("Inserting in specific position\n");
27     printf("Enter the size in Double linked list: ");
28     scanf("%d",&num);
29     temp->prev=NULL;
30     newnode=malloc(sizeof(struct node));
31     for(i=0;i<num;i++)
32     {
33         printf("element %d: ",i);
34         scanf("%d",&number);
35         temp->data=number;
36         if(i!=num-1)
37         {
38             temp->next=malloc(sizeof(struct node));
39             newnode=temp;
40             temp=temp->next;
41             temp->prev=newnode;
42         }
43     }
44     temp->next=NULL;
45     printf("Enter the element to Number to insert in specific position: ");
46     scanf("%d",&newnum);
47     printf("Enter the Position : ");
48     scanf("%d",&newpos);
49     temp=head;
50     Middlednode->data=newnum;
51     for(i=0;i<newpos-1;i++)
52     {
53         temp=temp->next;
54     }
55     temp2=temp;
56     temp=temp->next;
57     temp->prev=Middlednode;
58     Middlednode->next=temp;
59     Middlednode->prev=temp2;
60     temp2->next=Middlednode;
61     while(head!=NULL)
62     {
63         printf("%d->",head->data);
64         head=head->next;
65     }
66     printf("NULL\n");
67     return 0;
68 }
69
```

Output:

```
Inserting in specific position
Enter the size in Double linked list: 4
element 0: 1
element 1: 2
element 2: 4
element 3: 5
Enter the element to Number to insert in specific position: 3
Enter the Position : 2
1->2->3->4->5->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```

Deleting at Beginning:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //deleting in beginning in double Linked List
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len;
16     struct node* head;
17     struct node* temp;
18     struct node* newnode;
19     head=(struct node*)malloc(sizeof(struct node));
20     temp=malloc(sizeof(struct node));
21     temp=head;
22     printf("Enter the size in linked list: \n");
23     scanf("%d",&num);
24     temp->prev=NULL;
25     newnode=malloc(sizeof(struct node));
26     for(i=0;i<num;i++)
27     {
28         printf("element %d: ",i);
29         scanf("%d",&number);
30         temp->data=number;
31         if(i!=num-1)
32         {
33             temp->next=malloc(sizeof(struct node));
34             newnode=temp;
35             temp=temp->next;
36             temp->prev=newnode;
37         }
38     }
39     temp->next=NULL;
40     temp=head;
41     temp=temp->next;
42     temp->prev=NULL;
43     head=temp;
44     printf("After deleting at beginning : \n");
45     while(head!=NULL)
46     {
47         printf("%d->",head->data);
48         head=head->next;
49     }
50     printf("NULL\n");
51     return 0;
52 }
```

Output:

```
input
Enter the size in linked list:
5
element 0: 1
element 1: 2
element 2: 3
element 3: 4
element 4: 5
After deleting at beginning :
2->3->4->5->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```

Deleting at end:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //deleting in end in double Linked list
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12 };
13 int main()
14 {
15     int num,i,number,len;
16     struct node* head;
17     struct node* temp;
18     struct node* temp2;
19     struct node* newnode;
20     head=(struct node*)malloc(sizeof(struct node));
21     temp=malloc(sizeof(struct node));
22     temp=head;
23     printf("Enter the size in linked list: \n");
24     scanf("%d",&num);
25     temp->prev=NULL;
26     newnode=malloc(sizeof(struct node));
27     for(i=0;i<num;i++)
28     {
29         printf("element %d: ",i);
30         scanf("%d",&number);
31         temp->data=number;
32         if(i!=num-1)
33         {
34             temp->next=malloc(sizeof(struct node));
35             newnode=temp;
36             temp=temp->next;
37             temp->prev=newnode;
38         }
39     }
40     temp->next=NULL;
41     temp=temp->prev;
42     temp->next=NULL;
43     temp2=temp->prev;
44     temp->prev=temp2;
45     printf("After deleting at end : \n");
46     while(head!=NULL)
47     {
48         printf("%d->",head->data);
49         head=head->next;
50     }
51     printf("NULL\n");
52     return 0;
53 }
```

Output:

```
input
Enter the size in linked list:
5
element 0: 1
element 1: 2
element 2: 3
element 3: 4
element 4: 5
After deleting at end :
1->2->3->4->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```

Deletion at specific position:

Program:

```
main.c
1 //S.PRAVEEN KUMAR
2 //ch.en.u4aie22048 AIE
3 //Lab-4
4
5 //deleting in specific position in double linked list
6 #include<stdio.h>
7 #include<stdlib.h>
8 struct node{
9     int data;
10    struct node* next;
11    struct node* prev;
12};
13 int main()
14 {
15     int num,i,number,len,newnum,newpos;
16     struct node* head,*temp;
17     head=(struct node*)malloc(sizeof(struct node));
18     temp=malloc(sizeof(struct node));
19     temp=head;
20     printf("Deleting at specific postion\n");
21     printf("Enter the size in Double linked list: ");
22     scanf("%d",&num);
23     temp->prev=NULL;
24     for(i=0;i<num;i++)
25     {
26         printf("element %d: ",i);
27         scanf("%d",&number);
28         temp->data=number;
29         if(i!=num-1)
30         {
31             temp->next=malloc(sizeof(struct node));
32             temp->next->prev=temp;
33             temp=temp->next;
34         }
35     }
36     temp->next=NULL;
37     printf("Enter the Postion to delete: ");
38     scanf("%d",&newpos);
39     temp=head;
40
41     for(i=0;i<newpos-1;i++)
42     {
43         temp=temp->next;
44     }
45     temp->next=temp->next->next;
46     temp->next->prev=temp;
47     while(head!=NULL)
48     {
49         printf("%d->",head->data);
50         head=head->next;
51     }
52     printf("NULL\n");
53     return 0;
54 }
```

Output:

```
input
Deleting at specific postion
Enter the size in Double linked list: 5
element 0: 1
element 1: 2
element 2: 3
element 3: 3
element 4: 4
Enter the Postion to delete: 3
1->2->3->4->NULL

...Program finished with exit code 0
Press ENTER to exit console.
```