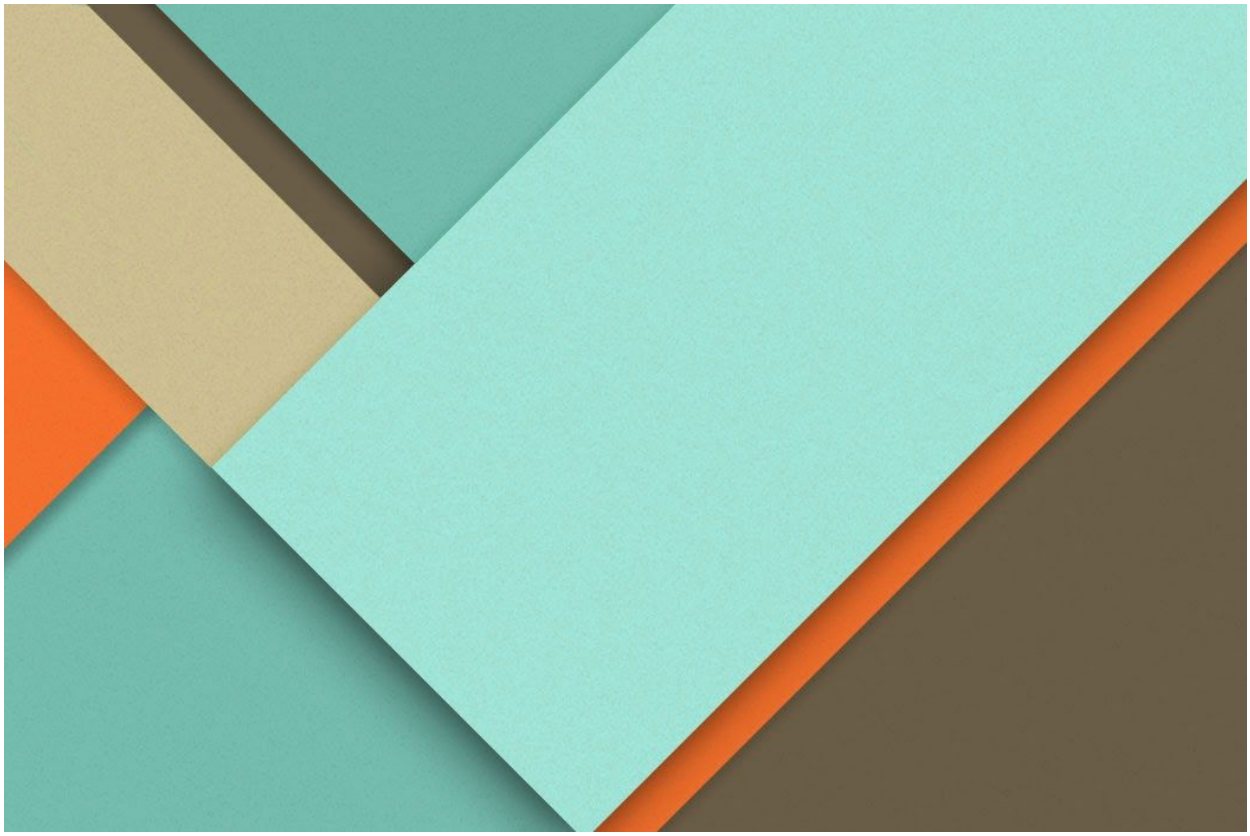

DSA Assignment

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1st-year CSE-E.

Programs on Doubly Linked List

1. Write a menu-driven C Program to implement following operations (in the form of function)

on a doubly linked list.

a. Create an empty doubly list.

b. Display the contents of the doubly list

c. Insert an element at the beginning of the double list.

d. Insert an element at the end of the list.

e. Insert an element after a given number in the double list.

f. Insert an element before a given number in the double list.

g. Delete a given element from the double list.

h. Sum of all elements present in the double list.

Solution:

```
#include<stdio.h>
#include<stdlib.h>
struct node
{
   int info;
   struct node *next;
   struct node *prev;
```

```
};

void c();

void getnode();

void d();

void ibe();

void ie();

void s();

void ia();

void ib();

void de();

void sum();

struct node *start=NULL,*temp,*ptr,*l=NULL,*loc;

void main()
{
   int ch;
```

```
do
{

    printf ("\n 1.Creataing a list\n 2.Getting a new node\n 3.Dispaying the list\n
4.inserting at begining\n 5.inserting at end\n 6.Searching a node\n 7.inserting after
a number\n 8.inserting before a number\n 9.Deleting a number\n 10.Sum of a list\n
11.Exit\n ");

    printf("-------------------");

    printf ("\nEnter your choice");

    scanf ("%d", &ch);

    switch (ch)

        {

    case 1: c();
       break;

    case 2: getnode();
       break;

    case 3: d();
            break;

    case 4: ibe();
```

```
            break;

case 5: ie();
    break;

case 6: s();
    break;

case 7: ia(s);
    break;

case 8: ib();
    break;

case 9: de(s);
    break;

case 10: sum();
    break;

case 11: exit (0);
            break;

default:

printf ("Invalid choice entered by the user");
        }
```

```
    }while(1);

}

void c()
{
        start=NULL;
        l=NULL;
}

void getnode()
{
    temp=(struct node*)malloc(sizeof(struct node));
    printf("Enter the number");
    scanf("%d",&temp->info);
}


void d()
{
    int n=1,x;
    if(x==NULL)
    {
        printf("No list is found");
    }
    else
```

```
    {
        temp=x;
        while(temp!=NULL)
        {
            printf("%d->",temp->info);
            n++;
            temp=temp->next;
        }
        printf("\n");
    }

}

void ibe()
{
    getnode();
    if(temp == NULL)
   {
       printf("\nOVERFLOW");
   }
   else
   {
        if(start==NULL)
        {
            temp->next = NULL;
            temp->prev=NULL;
            start=temp;
```

```
        }
        else
        {
          temp->prev=NULL;
          temp->next = start;
          start->prev=temp;
          start=temp;
        }
        printf("\nNode inserted\n");
    }
}

void ie()
{
    getnode();
    if(temp == NULL)
   {
       printf("\nOVERFLOW");
   }
   else
   {

       if(start == NULL)
       {
          temp->next = NULL;
          temp->prev = NULL;
          start = temp;
```

```
      }
      else
      {
        ptr = start;
        while(ptr->next!=NULL)
        {
            ptr = ptr->next;
        }
        ptr->next = temp;
        temp ->prev=temp;
        temp->next = NULL;
       }
   }
   l=temp;
   printf("\nnode inserted\n");
}


void s()
{
   int ele,i=0;
   ptr=start;
   printf("Enter the number after which you want to insert or delete that number
:%d ",ele);
   scanf("%d",&ele);
   while(ptr!=NULL)
   {
      i++;
```

```
        if(ptr->info==ele)
        {
            loc=ptr;
            break;
        }
        ptr=ptr->next;
    }
}

void ia()
{
    s();
    getnode();
    temp->next=loc->next;
    loc->next->prev=temp;
    loc->next=temp;
    temp->prev=loc;
    d();
}

void ib()
{
    s();
    getnode();
    temp->prev=loc->prev;
    loc->prev->next=temp;
    loc->prev=temp;
```

```
    temp->next=loc;
    d();
}



void de()
{
    s();
    if(loc==NULL)
    {
        printf("NO node to be deleted ");
    }
    else if(loc==start)
    {
        start=loc->prev;
        loc->next->prev=NULL;
        free(loc);
    }
    else if(loc==l)
    {
        l=loc->prev;
        loc->prev->next=NULL;
    }
    else
    {
        loc->prev->next=loc->next;
```

```
        loc->next->prev=loc->prev;
    }
    d();
}

void sum()
{
    int sum=0,m;
    ptr=start;
    while(ptr!=NULL)
    {
        m=ptr->info;
        sum=sum+m;
        ptr=ptr->next;
    }
    printf("The sum of the elements present in the data is %d",sum);
}
```

Output:

Choose one option from the following list ...

1.create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number.

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

1

created node

Choose one option from the following list ...

1.create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number.

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

2

Enter the data to be inserted

1

Choose one option from the following list ...

1.create
2.Insert in beginning
3.Insert at last
4.Insert after a number
5insertion before a number.
6.Delete num
7.sum
8.Display
9.Exit

Enter your choice?
2
Enter the data to be inserted
2

Choose one option from the following list ...

1.create
2.Insert in beginning
3.Insert at last
4.Insert after a number
5insertion before a number.
6.Delete num
7.sum
8.Display

9.Exit

Enter your choice?

3

Enter the data to be inserted

2

Choose one option from the following list ...

1.create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number.

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

4

Enter the Num

2

Enter the data to be inserted

5

Choose one option from the following list ...

1.create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number.

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

3

Enter the data to be inserted

4

Choose one option from the following list ...

1.create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number .

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

6 5

Enter the Num

3

Enter the data to be inserted

7

Choose one option from the following list ...

1. create

2.Insert in beginning

3.Insert at last

4.Insert after a number

5insertion before a number.

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

6

Enter the Num

4

4 is deleted

Choose one option from the following list ...

1.create

2.Insert in begining

3.Insert at last

4.Insert after a number

5insertion before a number .

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

7

7 is the sum

The list:

2

5

Choose one option from the following list ...

1.create

2.Insert in begining

3.Insert at last

4.Insert after a number

5insertion before a number .

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

8

The list:

2

5

Choose one option from the following list ...

1.create

2.Insert in begining

3.Insert at last

4.Insert after a number

5insertion before a number .

6.Delete num

7.sum

8.Display

9.Exit

Enter your choice?

9