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/*****
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/***** Class :- XII A *****/
/***** Date :- 11 October 2014 *****/
/***** Q-16):- Linklist *****/
/*****/
#include<iostream.h>
#include<conio.h>
#include<ctype.h>
#include<process.h>

///////////////////////////////// Declaration & Defination of Node //////////////////////////////////
struct node
{
    int roll;
    node *next;
};
/////////////////////////////////

/////////////////////////////////Declaration of Functions////////////////////////////////

node *create_node();
void create_list(node *&start); //as i am modifying start in the function
                                //without this it did not work
void display(node *start);
void insert(node *&start,node *&temp,int pos);
void del(node *&start,int roll);
void merge(node *&start1,node *&start2,node *&start3);
/////////////////////////////////

//*****Void Main()*****//
void main()
{
    cout<<"Program to perform basic operations on a linked list";

    int ch;
    node *start1=NULL,*start2=NULL,*start3=NULL;
    do
    {
        clrscr();
        cout<<"\tmain menu"
        <<"\n1)\tCreate List 1"
        <<"\n2)\tInsert"
        <<"\n3)\tDelete"
        <<"\n4)\tDisplay List 1"
        <<"\n5)\tCreate List 2"
        <<"\n6)\tMerge List 1(ASC) and List 2(ASC) in List 3(ASC)"
        <<"\n7)\tDisplay All Lists"
        <<"\n8)\tExit";

        cout<<"\n\nEnter Choice(1-8)";    cin>>ch;
    }
}

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switch(ch)
{
    case 1:
        create_list(start1);
        break;
    case 2:
        {
            node *temp;
            int pos;
            temp=create_node();
            cout<<"Enter Pos\t";
            cin>>pos;
            insert(start1,temp,pos);
        }
        break;
    case 3:
        {
            int roll;
            cin>>roll;
            del(start1,roll);
        }
        break;
    case 4:
        display(start1);
        break;
    case 5:
        create_list(start2);
        break;
    case 6:
        merge(start1,start2,start3);
        break;
    case 7:
        cout<<"\nList1";
        display(start1);
        cout<<"\nList2";
        display(start2);
        cout<<"\nList3";
        display(start3);
        break;
    case 8:
        exit(0);
        break;
}

cout<<"\n\nPress Y to Continue\t";
}while(toupper(getche())=='Y');
}
//*****End Of Main*****//

```

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/////////////////////////////////Defination of Functions/////////////////////////////////
node *create_node()
{
    node *nn;
    nn=NULL;
    nn=new node;
    if(nn)
    {
        cout<<"\n\nEnter Roll\t";
        cin>>nn->roll;
        nn->next=NULL;
    }
    return nn;
}
/////////////////////////////////
void create_list(node *&start)
{
    node *ptr,*nn;
    start=ptr=nn=NULL;

    do
    {
        nn=NULL;
        nn=create_node();
        if(!nn)
        {
            cout<<"Overflow";
            cout<<"Press any key to exit";
            getch();
            exit(0);
        }
        else
        {
            if(start==NULL)
            {
                start=ptr=nn;
            }
            else
            {
                ptr->next=nn;
                ptr=nn;
            }
        }
        cout<<"Press Y to Enter More";
    }while(toupper(getche())=='Y');
}
/////////////////////////////////

```

```
void display(node *start)
{
    node *ptr;
    ptr=start;
    if(start==NULL)
        cout<<"\nUnderflow";
    int i=0;
    while(ptr)
    {
        i++;
        cout<<"\nRoll "<<i<<"t"<<ptr->roll;
        ptr=ptr->next;
    }
}
//////////////////////////////////////////////////////////////////////////////////////////////////////////////////
void insert(node *&start,node *&temp,int pos)
{
    node *ptr=NULL;

    if(pos<1)
        cout<<"\nUnderflow";

    if(pos==1)
    {
        temp->next=start;
        start=temp;
    }
    else
    {
        int i;
        ptr=start;
        for(i=1;i<=pos-2;i++)
        {
            ptr=ptr->next;
        }

        if(ptr!=NULL)
        {
            temp->next=ptr->next;
            ptr->next=temp;
        }
        else
            cout<<"\nOverflow";
    }
}
```



```

if(ptr1->roll<ptr2->roll)
{
    nn->roll=ptr1->roll;
    ptr1=ptr1->next;
}
else
{
    nn->roll=ptr2->roll;
    ptr2=ptr2->next;
}

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```
if(start3==NULL)
{
start3=ptr3=nn;
}
```

```

else
{
ptr3->next=nn;
ptr3=nn;
}
}

```

```

if(ptr1==NULL)
{
while(ptr2)
{
nn=new node;
nn->next=NULL;
nn->roll=ptr2->roll;
ptr3->next=nn;
ptr3=nn;
ptr2=ptr2->next;
}
}

```

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if(ptr2==NULL)
{
    while(ptr1)
    {
        nn=new node;
        nn->next=NULL;
        nn->roll=ptr1->roll;
        ptr3->next=nn;
        ptr3=nn;
        ptr1=ptr1->next;
    }
}
}

```

////////////////////////////////////

OUTPUT

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)1

Enter Roll      1
Press Y to Enter Morey

Enter Roll      2
Press Y to Enter Morey

Enter Roll      3
Press Y to Enter Moren

Press Y to Continue
```

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)2

Enter Roll      5
Enter Pos       4

Press Y to Continue _
```

Please Turn Over..

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)4

Roll 1 1
Roll 2 2
Roll 3 3
Roll 4 5

Press Y to Continue
```

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)3
5

DELETED

Press Y to Continue
```

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)5

Enter Roll 0
Press Y to Enter Morey

Enter Roll 4
Press Y to Enter Morey

Enter Roll 5
Press Y to Enter Moren

Press Y to Continue _
```



```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)6

Press Y to Continue
```

```
main menu
1) Create List 1
2) Insert
3) Delete
4) Display List 1
5) Create List 2
6) Merge List 1(ASC) and List 2(ASC) in List 3(ASC)
7) Display All Lists
8) Exit

Enter Choice(1-8)7

List1
Roll 1 1
Roll 2 2
Roll 3 3
List2
Roll 1 0
Roll 2 4
Roll 3 5
List3
Roll 1 0
Roll 2 1
Roll 3 2
Roll 4 3
Roll 5 4
Roll 6 5

Press Y to Continue
```