Assignment- C08

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Problem Statement: Second year Computer Engineering class, set A of students like Vanilla Ice-cream and set B of students like butterscotch ice-cream. Write C/C++ program to store two sets using linked list. compute and display i. Set of students who like either vanilla or butterscotch or both ii. Set of students who like both vanilla and butterscotch iii. Set of students who like only vanilla not butterscotch iv. Set of students who like only butterscotch not vanilla v. Number of students who like neither vanilla nor butterscotch

Program :-

```
#include<iostream>
using namespace std;
struct node
{    int roll;
     struct node *next;
};
class info
{       node
*head1=NULL,*temp1=NULL,*head2=NULL,*temp2=NULL,*head=NULL,*temp=NULL,*h1=NUL
L,*head3=NULL,*temp3=NULL;
       int c,i,f,j,k;

       public:

          node  *create();
          void insert();
          void allstud();
          void vanila();
          void butters();
          void uice();
          void nice();
          void notice();
          void ovanila();
          void obutters();
          void display();



} ;
```

```
node *info::create()
{   node *p=new(struct node);
     cout<<"enter student rollno: ";
     cin>>c;
     p->roll=c;
     p->next=NULL;
     return  p;
  }
  void info::insert()
  {
       node *p=create();

     if(head==NULL)
     {    head=p;
     }
    else
    {      temp=head;
          while(temp->next!=NULL)
          {    temp=temp->next;   }
              temp->next=p;
     }

   }
   void info::display()
   {  temp=head;
      while(temp->next!=NULL)
     { cout<<"\n"<<temp->roll;
       temp=temp->next;
     } cout<<"\n"<<temp->roll;
   }
   void info::allstud()
   {cout<<"enter no. of students: ";
       cin>>k;
        head=NULL;
       for(i=0;i<k;i++)
       {    insert();
            h1=head;

       }  display();
       head=NULL;
    }
    void info::vanila()
    {
       cout<<"enter no. of  students who like vanila: \n";
```

```
  cin>>k;
   head=NULL;
  for(i=0;i<k;i++)
  { insert();
    head1=head;

  }  display();
   head=NULL;
 }
 void info::butters()
 {
  cout<<"enter no. of students who like butterscotch: \n";
   cin>>j;
   for(i=0;i<j;i++)
   { insert();
     head2=head;

   } display();
   head=NULL;
 }
  void info::uice()
{   cout<<"students who like vanila or butterscotch: \n";
 temp1=head1;
 while(temp1!=NULL)
 {
   node *p=new(struct node);
   p->roll=temp1->roll;
   p->next=NULL;
 if(head3==NULL)
 {    head3=p;
 }
 else
 {      temp3=head3;
        while(temp3->next!=NULL)
        {    temp3=temp3->next;   }
           temp3->next=p;
 }

   temp1=temp1->next;
 }
 temp2=head2;
 while(temp2!=NULL)
 {    f=0;
      temp1=head1;
```

```
        while(temp1!=NULL)
        {
        if(temp2->roll==temp1->roll)
        { f=1;                  }
         temp1=temp1->next;
        }



    if(f==0)
    {
        node *p=new(struct node);
      p->roll=temp2->roll;
      p->next=NULL;
      if(head3==NULL)
       {    head3=p;
       }
      else
      {      temp3=head3;
         while(temp3->next!=NULL)
         {    temp3=temp3->next;   }
            temp3->next=p;
      }
  }
     temp2=temp2->next;
    }
    temp3=head3;
     while(temp3->next!=NULL)
     { cout<<"\n"<<temp3->roll;
       temp3=temp3->next;
     } cout<<"\n"<<temp3->roll;
}


void info::ovanila()
{
       cout<<"\nstudents  like only vanila: \n";
       temp1=head1;
       while(temp1!=NULL)
       {  temp2=head2;
          f=0;
          while(temp2!=NULL)
          {   if(temp1->roll==temp2->roll)
              {  f=1;             }
```

```
            temp2=temp2->next;
          }

          if(f==0)
          { cout<<"\n"<<temp1->roll;    }
             temp1=temp1->next;
        }

}
void info::obutters()
{
    cout<<"\nstudents like only butterscotch :\n";
         temp2=head2;
        while(temp2!=NULL)
        {  temp1=head1;
           f=0;
           while(temp1!=NULL)
           {   if(temp2->roll==temp1->roll)
               {  f=1;             }
                temp1=temp1->next;
           }

           if(f==0)
           { cout<<"\n"<<temp2->roll;    }
              temp2=temp2->next;
        }


}
void info::nice()
{
       cout<<"\nstudents who like both vanila and butterscotch :\n";
       temp1=head1;
       while(temp1!=NULL)
       { temp2=head2;
         while(temp2!=NULL)
         {  if(temp1->roll==temp2->roll)
             { cout<<"\n"<<temp1->roll;   }
              temp2=temp2->next;
          }

            temp1=temp1->next;
        }
```

```
}
 void info::notice()
 {

    cout<<"\nstudents who like neither vanila nor butterscotch :\n";
    temp=h1;
      while(temp!=NULL)
      {  temp3=head3;
        f=0;
        while(temp3!=NULL)
        {   if(temp->roll==temp3->roll)
            {  f=1;             }
             temp3=temp3->next;
        }

        if(f==0)
        { cout<<"\n"<<temp->roll;    }
          temp=temp->next;
       }

}

int main()
  { info s;
  int i;

        char ch;
      do{
        cout<<"\n choice the options";
        cout<<"\n  1. To enter all students rollno  ";
        cout<<"\n  2. To enter the rollno of student who like vanila";
        cout<<"\n  3.  To enter the rollno of student who like butterscotch";
        cout<<"\n  4.  To display the rollno of student who like vanila or butterscotch";
        cout<<"\n  5.  To display the rollno of student who like only vanila";
        cout<<"\n  6.  To display the rollno of student who like only butterscotch";
        cout<<"\n  7.  To display the rollno of student who like both vanila and butterscotch ";
        cout<<"\n  8.  To display the rollno of student who neither like vanila nor butterscotch : ";


        cin>>i;
       switch(i)
       {       case 1:
                 s.allstud();
                 break;
```

```
            case 2:
              s.vanila();
               break;
             case 3:
              s.butters();
              break;
             case 4:
              s.uice();
              break;
             case 5:
              s.ovanila();
              break;
             case 6:
              s. obutters();
              break;
             case 7:
              s.nice();
              break;
             case 8:
              s.notice();
              break;



             default:  cout<<"\n unknown choice";
         }
           cout<<"\n do you want to continue enter y/Y \n";
           cin>>ch;

      }while(ch=='y'||ch=='Y');

return 0;
}
```

Output :-

```
 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 1
enter no. of students: 7
enter student rollno: 1
enter student rollno: 2
enter student rollno: 3
enter student rollno: 4
enter student rollno: 5
enter student rollno: 6
enter student rollno: 7

1
2
3
4
5
6
7
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 2
enter no. of  students who like vanila:
5
enter student rollno: 1
enter student rollno: 2
enter student rollno: 4
enter student rollno: 5
enter student rollno: 6
```

PROBLEMS OUTPUT TERMINAL DEBUG CONSOLE

Code

```
1
2
4
5
6
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 3
enter no. of students who like butterscotch:
5
enter student rollno: 1
enter student rollno: 2
enter student rollno: 7
enter student rollno: 3
enter student rollno: 4

1
2
7
3
4
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 4
students who like vanila or butterscotch:
```

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                                Code
  8.  To display the rollno of student who neither like vanila nor butterscotch : 4
students who like vanila or butterscotch:

1
2
4
5
6
7
3
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 5

students  like only vanila:

5
6
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 6

students like only butterscotch :

7
3
 do you want to continue enter y/Y
```

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                                Code
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 6

students like only butterscotch :

7
3
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 7

students who like both vanila and butterscotch :

1
2
4
 do you want to continue enter y/Y
y

 choice the options
  1. To enter all students rollno
  2. To enter the rollno of student who like vanila
  3.  To enter the rollno of student who like butterscotch
  4.  To display the rollno of student who like vanila or butterscotch
  5.  To display the rollno of student who like only vanila
  6.  To display the rollno of student who like only butterscotch
  7.  To display the rollno of student who like both vanila and butterscotch
  8.  To display the rollno of student who neither like vanila nor butterscotch : 8

students who like neither vanila nor butterscotch :

 do you want to continue enter y/Y
```