**Assignment Number: 15**

**Subject: Data Structure and Algorithms**

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**Division: B**

**Batch: B1**

**Title/Problem Statement:**

Write C++ program to maintain club members, sort on roll numbers in ascending order.   
Write function Ternary\_Search to search whether particular student is member of club.   
Ternary search is modified binary search that divides array into 3 halves instead of two

**CODE**

#include<iostream>

#include<limits>

using namespace std;

int a[20],key,n,ch,m1,m2,x,temp=0,i=0,j=0;

void getdata()

{

cout<<"Enter the total members of club :"<<endl;

for(;;)

{

if(cin>>n)

{

break;

}

else

{

cout<<"please enter a valid no !!!"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

cout<<"Enter the roll number : "<<endl;

for(int i=0;i<n;i++)

{

for(;;)

{

if(cin>>a[i])

{

break;

}

else

{

cout<<"please enter a valid no !!!"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

}

}

void sort(int a[])

{

for(i=0;i<n;i++)

{

for(j=0;j<n-1-i;j++)

{

if(a[j]>a[j+1])

{

temp=a[j];

a[j]=a[j+1];

a[j+1]=temp;

}

}

}

cout<<"sort roll number are :"<<endl;

for(i=0;i<n;i++)

{

cout<<a[i]<<"\t";

}

}

int ternarys(int a[],int n,int m1,int m2,int key)

{

if(m1<0 ||m2>n-1 || m1>m2)

{

return -1;

}

if(key==a[m1])

{

return m1;

}

if(key==a[m2])

{

return m2;

}

if(key<a[m1])

{

return ternarys(a,n,m1-1,m2,key);

}

if(key>a[m1]&& key<a[m2])

{

return ternarys(a,n,m1+1,m2-1,key);

}

if(key>a[m2])

{

return ternarys(a,n,m1,m2+1,key);

}

}

int main()

{

do

{

cout<<"\n\t\t1]. Accept data"<<endl;

cout<<"\n\t\t2]. sort the data"<<endl;

cout<<"\n\t\t3]. searching by using ternary search."<<endl;

cout<<"\n\t\t4]. Exit"<<endl;

cout<<"Enter the choice"<<endl;

cin>>ch;

switch(ch)

{

case 1 :

getdata();

break;

case 2 :

sort(a);

break;

case 3 :

m1=n/3;

m2=(n/3)\*2;

cout<<"Enter the elements to be search : "<<endl;

for(;;)

{

if(cin>>key)

{

break;

}

else

{

cout<<"please enter a valid no !!!"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

if(ternarys(a,n,m1,m2,key)==-1)

{

cout<<"Roll number is absent !!!"<<endl;

}

else

{

cout<<"Roll number is present"<<endl;

x=ternarys(a,n,m1,m2,key);

cout<<"& postion is : "<<x<<endl;

}

break;

case 4 :

//exit.

break;

default :

cout<<"Enter valid choice !!!"<<endl;

break;

}

}while(ch!=4);

return 0;

}

/\* output

1]. Accept data

2]. sort the data

3]. searching by using ternary search.

4]. Exit

Enter the choice

1

Enter the total members of club :

4

Enter the roll number :

1

2

3

4

1]. Accept data

2]. sort the data

3]. searching by using ternary search.

4]. Exit

Enter the choice

2

sort roll number are :

1 2 3 4

1]. Accept data

2]. sort the data

3]. searching by using ternary search.

4]. Exit

Enter the choice

3

Enter the elements to be search :

2

Roll number is present

& postion is : 1

1]. Accept data

2]. sort the data

3]. searching by using ternary search.

4]. Exit

Enter the choice

4

\*/