**Aim:**

To write a program to perform Linear Search & Binary Search on a Structured Array.

**Source Code:**

#include<iostream.h>

#include<conio.h>

#include<stdio.h>

class student

{

int rno;

char name[20],grade;

float marks;

void assigngrade()

{

if(marks>90)

{

grade='A';

}

else if(grade>70)

{

grade='B';

}

else if(grade>50)

{

grade='C';

}

else

{ grade='D';

}

}

public:

int getrno()

{

return rno;

}

void getdata()

{

cout<<"Enter roll number = ";

cin>>rno;

cout<<"Enter name =";

gets(name);

cout<<"Enter marks =";

cin>>marks;

assigngrade();

}

void showdata()

{

cout<<"\nRoll number ="<<rno;

cout<<"\nName ="<<name;

cout<<"\nMarks ="<<marks;

cout<<"\nGrade ="<<grade;

}

};

int LSearch(student\* s,int n,student s1)

{

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

{

if(s1.getrno()==s[i].getrno())

{

return (i+1);

}

}

return(-1);

}

int BSearch(student\* s,int n,student s1,char order)

{

int beg,mid,last;

beg=0;

last=n-1;

while(beg<=last)

{

if(order=='a')

{

mid=(beg+last)/2;

if(s[mid].getrno()==s1.getrno())

{

return (mid+1);

}

else if(s[mid].getrno()<s1.getrno())

{

beg=mid+1;

}

else

{

last=mid-1;

}

}

else if(order=='d')

{

mid=(beg+last)/2;

if(s[mid].getrno()==s1.getrno())

{

return (mid+1);

}

else if(s[mid].getrno()>s1.getrno())

{

beg=mid+1;

}

else

{

last=mid-1;

}

}

}

return(-1);

}

void main()

{

char ch1='n',order;

student s[100],s1;

int ch,size,index;

do

{

clrscr();

cout<<"Element Searching Algorithm :";

cout<<"\n\n1.Linear Search";

cout<<"\n\n2.Binary Search";

cout<<"\n\nEnter choice ";

cin>>ch;

switch(ch)

{

case 1:

{

clrscr();

cout<<" Linear Search ";

cout<<"\nEnter the size of array : ";

cin>>size;

cout<<"\n Reciving the Elements ........\n";

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

{

s[i].getdata();

cout<<"\n";

}

cout<<"\n\nEnter element to be searched\n";

s1.getdata();

index=LSearch(s,size,s1);

if(index==-1)

{

cout<<"FAIL :Element not found";

}

else

{

cout<<"SUCESS :Element found at "<<index;

}

break;

}

case 2:

{

clrscr();

cout<<"Binary Search ";

cout<<"\n\nEnter size of array ";

cin>>size;

cout<<"Enter order of array(a/d) ";

cin>>order;

cout<<"\n";

if(order=='a')

{

cout<<"Enter elements of the array\n";

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

{

do

{

if(i>0)

{

s[i].getdata();

cout<<"\n";

if(s[i-1].getrno()<s[i].getrno())

{

break;

}

else

{

cout<<"ERROR :PLEASE enter record in CORRECT ORDER";

}

}

else

{

s[i].getdata();

break;

}

}while(1);

}

cout<<"\nRecoreds recived....";

cout<<"\nEnter element to be searched\n";

s1.getdata();

index=BSearch(s,size,s1,order);

}

else if(order=='d')

{

cout<<"Enter elements of the array\n";

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

{

do

{

if(i>0)

{

s[i].getdata();

cout<<"\n";

if(s[i-1].getrno()>s[i].getrno())

{

break;

}

else

{

cout<<"ERROR :PLEASE enter record in CORRECT ORDER";

}

}

else

{

s[i].getdata();

break;

}

}while(1);

}

index=BSearch(s,size,s1,order);

}

if(index==-1)

{

cout<<"FAIL :Element not found";

}

else

{

cout<<"SUCESS :Element found at "<<index;

}

break;

}

}

cout<<"\nDo you want to continue ";

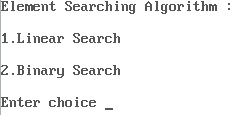
cin>>ch1;

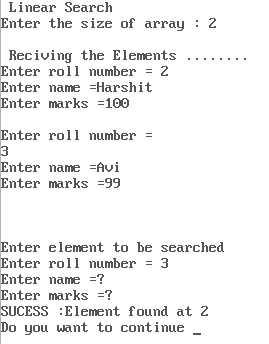
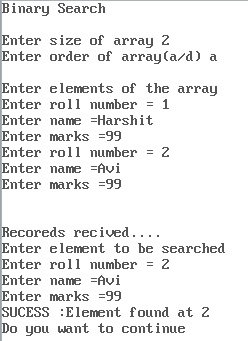
}while(ch1=='y');

getch();

}

**Output :**

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