**Assignment C25**

/\*Write C++ program to store roll numbers of student in array who attended training program in random order. Write function for-

a) Searching whether particular student attended training program or not using linear search and sentinel search. b) Searching whether particular student attended training program or not using binary search and Fibonacci search

\*/

===========================================================================

**#include**<iostream>

**using** **namespace** std;

**class** search

{

**public**:

**int** n,i,data[50],son[50],sortdata[50],s;

**void** **intake**()

{

cout<<"\nEnter No. of Elements=";

cin>>n;

cout<<"\nEnter Elements=\n";

**for**(i=1;i<=n;i++)

{

cin>>data[i];

son[i]=data[i];

}

}

**void** **search\_lini**(**int** item)

{

s=0;

**for**(i=1;i<=n;i++)

{

**if**(data[i]==item)

{ s=1;

**break**;

}

}

**if**(s==1)

cout<<item<<" attended training program:\n";

**else**

cout<<item<<" didn't attended training program:\n";

}

**void** **search\_senti**(**int** item)

{

**int** last = data[n-1];

data[n-1] = item; // Here item is the search element.

**int** i = 0;

**while**(data[i]!=item)

{

i++;

}

data[n-1] = last;

**if**( (i < n-1) || (item == data[n-1]) )

{

cout <<item<<" attended Training Program ";

}

**else**

{

cout << item<<" didn't attend Training Program.";

}

/\*int i=0;

while(data[i]!=a && i<n)

{

i++;

}

if(i<n)

cout<<a<<" attended Training Program.\n";

else

cout<<a<<" didn't attend Training Program.\n";\*/

}

**void** **search\_bin**(**int** x)

{

**int** y=0;

**int** left, right,mid;

left=0;

right=n-1;

**while**(left<=right)

{

mid=(left+right)/2;

**if**(data[mid]==x)

{

y=1;

**break**;

}

**else** **if**(data[mid]>x)

right = mid-1;

**else** **if**(data[mid]<x)

left=mid+1;

}

**if**(y==1)

cout<<x<<" attended Training Program.\n";

**else**

cout<<x<<" didn't attend Training Program.\n";

}

**int** **fibsearch**(**int** x)

{

**int** inf = 0, pos, k;

**static** **int** kk= -1, nn = -1;

**static** **int** fib[]={0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987,

1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811,

514229, 832040, 1346269, 2178309, 3524578, 5702887, 9227465, 14930352, 24157817,

39088169, 63245986, 102334155, 165580141};

**if** (nn != n)

{

k = 0;

**while** (fib[k] < n)

k++;

kk = k;

nn = n;

}

**else**

k = kk;

**while** (k > 0)

{

pos = inf + fib[--k];

**if** ((pos >= n) || (x < data[pos]));

**else** **if** (x > data[pos])

{

inf = pos + 1;

k--;

}

**else**

**return** pos;

}

**return** -1;

}

**void** **sort**()

{

**int** p,j,temp;

**for**(p=1;p<=n-1;p++)

{

**for**(j=1;j<=n-1;j++)

{

**if**(data[j]>data[j+1])

{

temp=data[j];

data[j]=data[j+1];

data[j+1]=temp;

}

}

}

}

};

**int** **main**()

{

**int** s,r,pos;

**char** ch;

search t;

cout<<"\n1. Linear Search.\n2. Sentinel Search.\n3. Binary Search.\n4.fibonacci search";

t.intake();

t.sort();

**do**

{

cout<<"\nEnter your choice 1. Linear Search.2. Sentinel Search.3. Binary Search.4.fibonacci search";

cin>>s;

cout<<"\nEnter Roll no. to search:";

cin>>r;

**switch**(s)

{

**case** 1:

t.search\_lini(r);

**break**;

**case** 2:

t.search\_senti(r);

**break**;

**case** 3:

t.search\_bin(r);

**break**;

**case** 4:

pos=t.fibsearch(r);

**if**(pos>=0)

cout<<"attended training program"<<endl;

**else**

cout<<"didn't attended training program"<<endl;

**break**;

}

cout<<"\nDo u want to continue(y/n)";

cin>>ch;

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

**return** 0;

}