**SSN COLLEGE OF ENGINEERING (Autonomous)**

**Affiliated to Anna University**

**DEPARTMENT OF CSE**

**UCS 1312 Data Structures Lab Laboratory**

**EX1 : SEARCHING AND SORTING**

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**CLASS: CSE-B (SEMESTER-3)**

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**Aim**

To write a menu driven program to perform the following operations 1. Linear Search 2. Binary Search 3. Linear Sort and 4. Bubble Sort

**Source code:**

#include<stdio.h>

#include<string.h>

void linearsearch(int a[100],int n)

{

int search,flag=0,pos;

printf("Enter the search element");

scanf("%d",&search);

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

{

if(a[i]==search)

{

pos=i+1;

flag=1;

printf("Element found in position %d\n",pos);

break;

}

}

if(flag==0)

{

printf("Element not found\n");

}

}

void insertionsort(int a[100],int n)

{

int j,temp;

for(int i=1;i<n-1;i++)

{

j=i;

while(j>0 && a[j-1]>a[j])

{

temp=a[j-1];

a[j-1]=a[j];

a[j]=temp;

}

j--;

}

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

{

printf("%d ",a[i]);

}

}

void sort(int a[100],int n)

{

int temp=0,ch;

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

{

for(int j=i+1;j<n;j++)

{

if(a[i]>a[j])

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

}

}

void binary(int a[100],int n)

{

int ch;

again:

printf("\n1.Bubble Sort\n2.Insertion sort\nEnter your choice");

scanf("%d",&ch);

printf("\n");

switch(ch)

{

case 1:sort(a,n);

break;

case 2:insertionsort(a,n);

break;

default: printf("\nInvalid choice try again");

goto again;

break;

}

printf("Array is sorted\n");

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

{

printf("%d\t",a[i]);

}

int pos=-1,first=0,last=n-1,element,mid;

printf("Enter element to be searched");

scanf("%d",&element);

while(first<=last)

{

mid=(first+last)/2;

if(a[mid]==element)

{

pos=mid+1;

printf("Element found in %d\n",pos);

break;

}

else

{

if(element>a[mid])

{

first=mid+1;

}

else

{

last=mid-1;

}

}

}

if(pos==-1)

{

printf("Element not found\n");

}

}

int main()

{

int a[100],n,ch;

printf("Enter no.of elements ");

scanf("%d",&n);

printf("Enter the elements\n");

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

{

scanf("%d",&a[i]);

}

do

{

printf("\n1.Linear search\n2.Binary search\n9.Exit\nEnter your choice");

scanf("%d",&ch);

printf("\n");

switch(ch)

{

case 1:linearsearch(a,n);

break;

case 2:binary(a,n);

break;

case 3:sort(a,n);

break;

case 4:insertionsort(a,n);

break;

default: printf("\nInvalid choice try again");

break;

}

}while(ch!=9);

return 0;

}

**Output**

Enter no.of elements 5

Enter the elements

1 3 5 2 4

1.Linear search

2.Binary search

9.Exit

Enter your choice1

Enter the search element2

Element found in position 4

1.Linear search

2.Binary search

9.Exit

Enter your choice1

Enter the search element6

Element not found

1.Linear search

2.Binary search

9.Exit

Enter your choice2

1.Bubble Sort

2.Insertion sort

Enter your choice1

Array is sorted

1 2 3 4 5 Enter element to be searched3

Element found in 3

1.Linear search

2.Binary search

9.Exit

Enter your choice2

1.Bubble Sort

2.Insertion sort

Enter your choice2

Array is sorted

1 2 3 4 5 Enter element to be searched6

Element not found

1.Linear search

2.Binary search

9.Exit

Enter your choice9