SSN COLLEGE OF ENGINEERING (Autonomous)

Affiliated to Anna University

DEPARTMENT OF CSE

UCS308 Data Structures Lab

Assignment 1

Searching and Sorting

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1. Write a menu driven program to perform the following operations

```
#include<stdio.h>
int getop()
{     int op;
      printf("\nChoose\n1.Linear Search\n2.Binary Search\n3.Insertion
Sort\n4.Selection Sort\n");
      scanf("%d",&op);
      return(op);
}
void linsearch(int a[],int n)
{     int i,s,flag=0;
      printf("\nEnter element to be searched\n");
      scanf("%d",&s);
      for(i=0;i<n;i++)
      {     if(a[i]==s)
            {     printf("Element found. Position %d\n",(i+1));
                  flag=1;
            }
      }
      if(flag==0)
```

```
	{	printf("Not found\n");
	}
}
void selsort(int a[],int n)
{	int i,j,temp;
	for(i=0;i<n;i++)
	{	for(j=i;j<n;j++)
		{	if(a[i]>a[j])
			{	temp=a[i];
				a[i]=a[j];
				a[j]=temp;
			}
		}
	}
	printf("\nSorted\n");
	for(i=0;i<n;i++)
	{	printf("%d ",a[i]);
	}
}
void inssort(int a[],int n)
{	int i,j,k;
	for(i=0;i<n;i++)
	{	k=a[i];
		j=i-1;
		while(j>=0 && a[j]>k)
		{	a[j+1]=a[j];
			j-=1;
		}
		a[j+1]=k;
	}
	printf("\nSorted\n");
	for(i=0;i<n;i++)
	{	printf("%d ",a[i]);
	}
}
void binsearch(int a[],int n)
{	int i,j,s,low=0,high=n-1,temp,flag=0,mid;
	printf("\nEnter element to be searched\n");
	scanf("%d",&s);
	for(i=0;i<n;i++)
	{	for(j=i;j<n;j++)
		{	if(a[i]>a[j])
			{	temp=a[i];
				a[i]=a[j];
				a[j]=temp;
			}
		}
	}
	while(flag==0)
	{	mid=(high+low)/2;
		if(a[mid]>s)
		{	high=mid-1;
		}
		else if(a[mid]<s)
		{	low=mid+1;
		}
		else
		{	printf("Element Found. Position %d",(mid+1));
```

```
                flag=1;
            }
      }
}
int main()
{     int a[20],n,op,i,r;
      printf("Enter the length of array\n");
      scanf("%d",&n);
      for(i=0;i<n;i++)
      {     scanf("%d",&a[i]);
      }
      op=getop();
      switch(op)
      {     case 1: linsearch(a,n);
                  break;
            case 2: binsearch(a,n);
                  break;
            case 3: inssort(a,n);
                  break;
            case 4: selsort(a,n);
                  break;
      }
      printf("\nCONTINUE?\n1.Yes\n2.No");
      scanf("%d",&r);
      if(r==1)
      {     main();
      }
      else
            return(0);
}
```

Output:

```
Enter the length of array

5

55

77

33

44

5


Choose

1.Linear Search

2.Binary Search

3.Insertion Sort
```

```
4.Selection Sort
1

Enter element to be searched
5
Element found. Position 5

CONTINUE?
1.Yes
2.No1
Enter the length of array
5
88
4
6
14
76

Choose
1.Linear Search
2.Binary Search
3.Insertion Sort
4.Selection Sort
2

Enter element to be searched
4
Element Found. Position 1
CONTINUE?
1.Yes
2.No1
Enter the length of array
5
```

```
98
78
45
55
3

Choose
1.Linear Search
2.Binary Search
3.Insertion Sort
4.Selection Sort
3

Sorted
3 45 55 78 98
CONTINUE?
1.Yes
2.No1
Enter the length of array
5
90
7
45
2
23

Choose
1.Linear Search
2.Binary Search
3.Insertion Sort
4.Selection Sort
4
```

Sorted

2 7 23 45 90

CONTINUE?

1.Yes

2.No2