K. J. Somaiya College of Engineering, Mumbai-77

A Constituent College of Somaiya Vidyavihar University

Batch:C2-2	**Roll No.: 16010122109**
Experiment / assignment / tutorial No. 5	
Grade: AA / AB / BB / BC / CC / CD /DD	
Signature of the Staff In-charge with date	

TITLE: Program to sort array

AIM: Program to sort the 1D array in the ascending or descending order and then accept the element from user and insert in the same array at its correct place by keeping array sorted

Expected OUTCOME of Experiment:

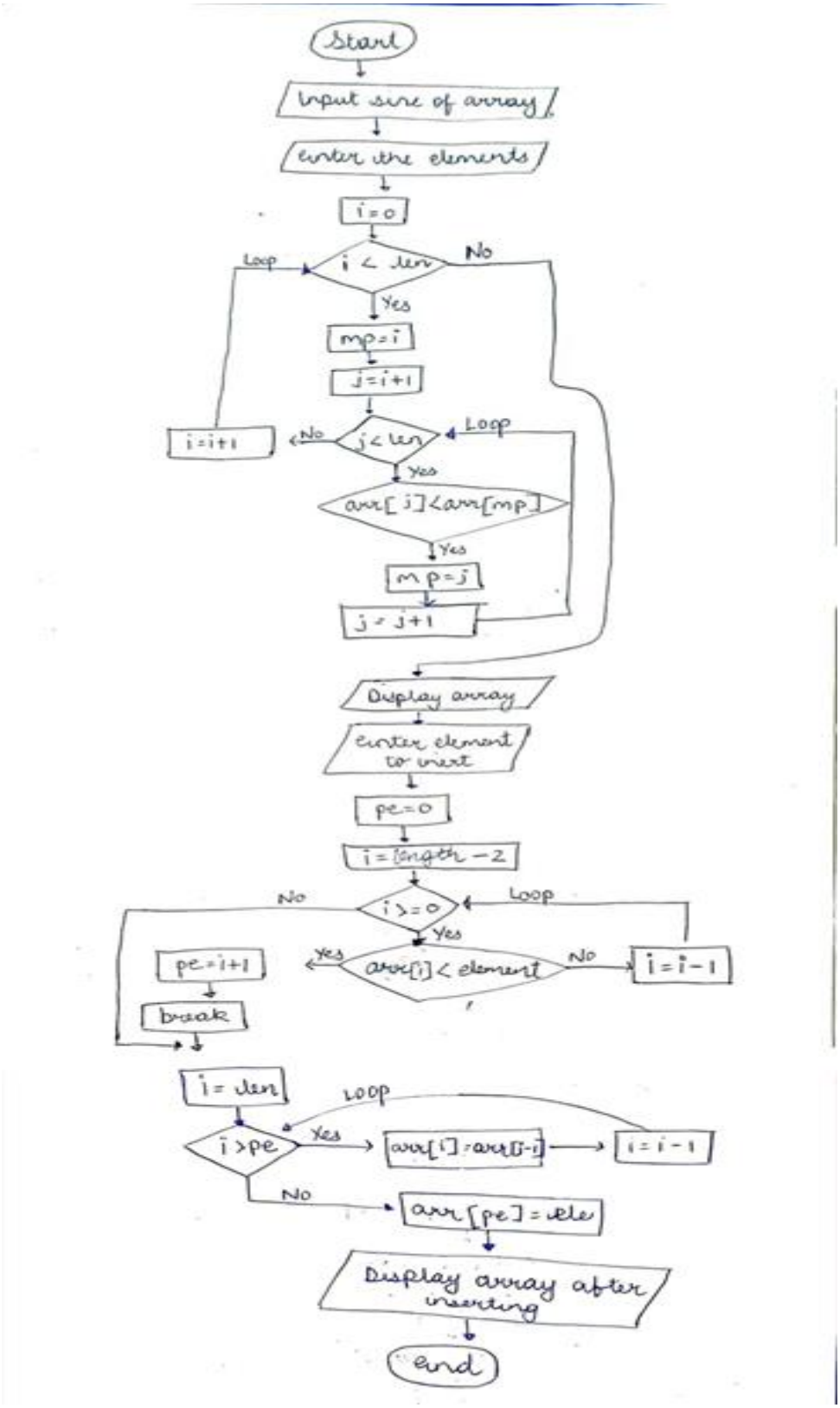
Books/ Journals/ Websites referred:

1. Programming in C, second edition, Pradeep Dey and Manas Ghosh, Oxford University Press.
2. Programming in ANSI C, fifth edition, E Balagurusamy, Tata McGraw Hill.
3. Introduction to programming and problem solving, G. Michael Schneider ,Wiley India edition.
4. http://cse.iitkgp.ac.in/~rkumar/pds-vlab/

Problem Definition:

The program takes a 1D array and sorts it in the specified manner. The user enters an element and the same has to be inserted at the correct place in the sorted array.

Flowchart:


Start
Input size of array
enter the elements
i=0
i < len
Loop
No
Yes
mp=i
j=i+1
i=i+1
No
j< len
Loop
Yes
arr[j]<arr[mp]
Yes
mp=j
j=j+1
Display array
enter element to insert
pe=0
i=length-2
No
i>=0
Loop
Yes
pe=i+1
Yes
arr[i] < element
No
i=i-1
break
i=len
Loop
i>pe
Yes
arr[i]=arr[i-1]
i=i-1
No
arr[pe]=ele
Display array after inserting
end

Implementation details:

```
#include<stdio.h>
intmain()
{
printf("Enter the number of elements:\n");
intlen;
scanf("%d",&len);
intarr[++len];
printf("Enter the list:\n");
for(inti=0;i<len-1;i++)
scanf("%d",&arr[i]);
arr[len-1]=100000;
// sorting elements
for(inti=0;i<len;i++)
{
intmp=i;
for(intj=i+1;j<len;j++)
                {
if(arr[j]<arr[mp])
mp=j;
                }
inttemp=arr[i];
arr[i]=arr[mp];
arr[mp]=temp;
}
printf("\nData After sorting: \n");
for(inti=0;i<len-1;i++)
printf("%d ",arr[i]);
printf("\n");
intele;
printf("Enter the element you want to insert:\n");
scanf("%d",&ele);
//finding where to insert
intpe=0;
for(inti=len-2;i>=0;i--)
{
if(arr[i]<ele){
pe=i+1;
break;}
}
//inserting here
for(inti=len;i>pe;i--)
arr[i]=arr[i-1];
arr[pe]=ele;
//completed inserting
printf("List after inserting and sorting:\n");
for(inti=0;i<len;i++)
printf("%d ",arr[i]);
```

```
return0;
}
```

Output(s):

```
Enter the number of elements:
6
Enter the list:
2 3 4 5 6 8
Data After sorting:
2 3 4 5 6 8
Enter the element you want to insert:
7
List after inserting and sorting:
2 3 4 5 6 7 8
```

Conclusion:

Thus, we learnt sorting and inserting in array.

Post Lab Descriptive Questions

Write a program to enter n numbers, store them in an array and rearrange the array in the reverse order.

```
#include<stdio.h>
intmain() {
intn;
printf("Enter the number of Elements: ");
scanf("%d",&n);
printf("Enter the elements\n");
intarr[n];
for(inti=0;i<n;i++)
scanf("%d",&arr[i]);
for(inti=0;i<n/2;i++)
{
inttemp=arr[i];
```

```
arr[i]=arr[n-1-i];
arr[n-1-i]=temp;
}
printf("In Reverse order: \n");
for(inti=0;i<n;i++)
printf("%d ",arr[i]);
return0;
}
```

```
Enter the number of Elements: 7
Enter the elements
3 2 1 5 6 4 8
In Reverse order:
8 4 6 5 1 2 3
```

Date: _____ **Signature of faculty in-charge**