Vidyalankar Polytechnic	DEPARTMENT OF COMPUTER ENGINEERING

Subject: - DATA STRUCTURE	**Subject Code:** 313 301
Semester: - III	**Course:** COMPUTER ENGINEERING
Laboratory No: L003	**Name of Subject Teacher:** Prof. Imraan S.
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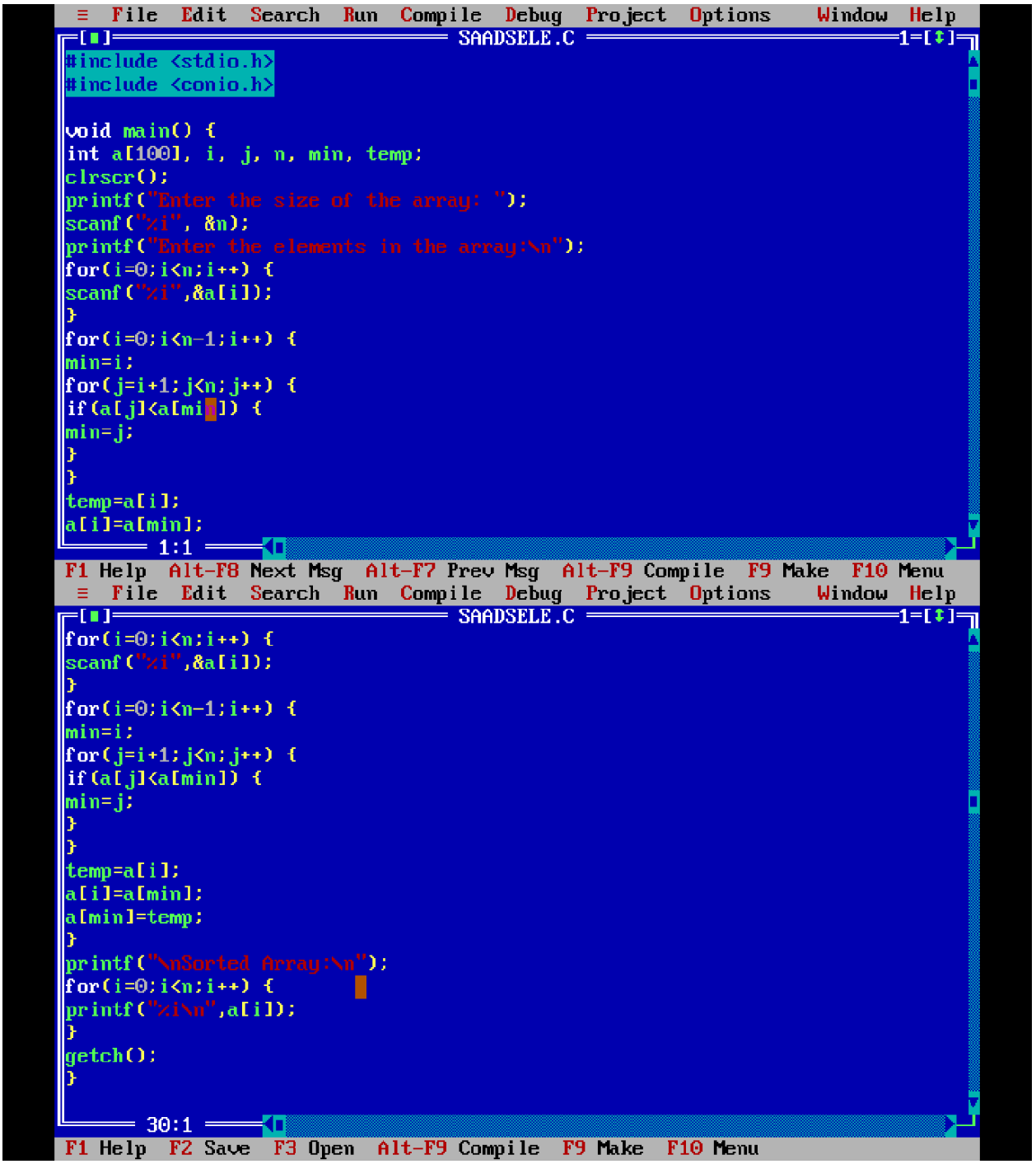
Experiment No:	8
Title of Experiment	* Write a 'C' Program to Sort an Array of numbers using Selection Sort Method.

Aim: Write a 'C' Program to Sort an Array of numbers using Selection Sort Method.

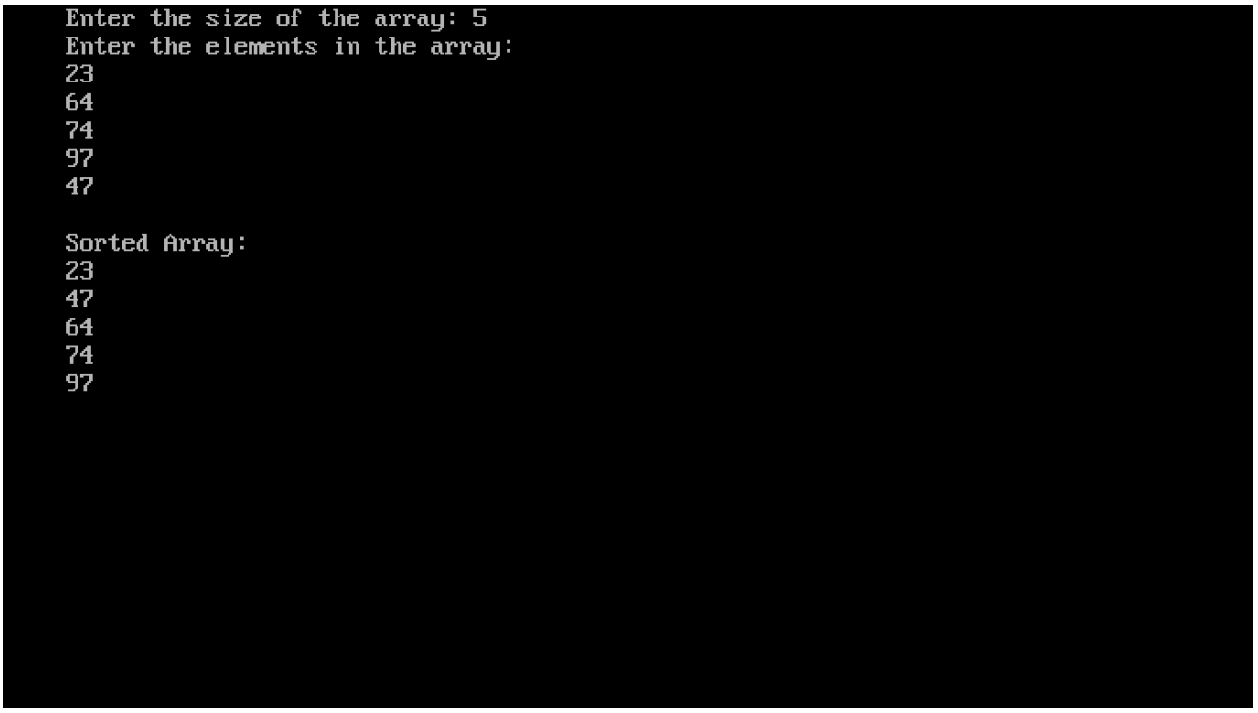
Algorithm:

Step 1: Start
Step 2: Declare an integer array a[100] and variables i, n
Step 3: Clear screen using clrscr()
Step 4: Print "Enter the size of the array:"
Step 5: Scan the value of n from keyboard
Step 6: Print "Enter the elements in the array:"
Step 7: Run a loop from i = 0 to i < n
Step 7.1: Scan each element and store it in a[i]
Step 8: Call the function sort(a, n)
Step 9: Inside the sort() function
Step 9.1: Declare integer variables i, j, min, temp
Step 9.2: Run a loop from i = 0 to i < n - 1
Step 9.2.1: Set min = i
Step 9.2.2: Run a nested loop from j = i + 1 to j < n
Step 9.2.2.1: If a[j] < a[min], then set min = j
Step 9.2.3: Swap a[i] with a[min] using temp
Step 10: After returning from function, print "Sorted Array:"
Step 11: Run a loop from i = 0 to i < n
Step 11.1: Print a[i]
Step 12: Stop

Code:


File Edit Search Run Compile Debug Project Options Window Help
SAADSELE.C
#include <stdio.h>
#include <conio.h>
void main() {
int a[100], i, j, n, min, temp;
clrscr();
printf("Enter the size of the array: ");
scanf("%i", &n);
printf("Enter the elements in the array:\n");
for(i=0;i<n;i++) {
scanf("%i",&a[i]);
}
for(i=0;i<n-1;i++) {
min=i;
for(j=i+1;j<n;j++) {
if(a[j]<a[mi]) {
min=j;
}
}
temp=a[i];
a[i]=a[min];
1:1
F1 Help Alt-F8 Next Msg Alt-F7 Prev Msg Alt-F9 Compile F9 Make F10 Menu
File Edit Search Run Compile Debug Project Options Window Help
SAADSELE.C
for(i=0;i<n;i++) {
scanf("%i",&a[i]);
}
for(i=0;i<n-1;i++) {
min=i;
for(j=i+1;j<n;j++) {
if(a[j]<a[min]) {
min=j;
}
}
temp=a[i];
a[i]=a[min];
a[min]=temp;
}
printf("\nSorted Array:\n");
for(i=0;i<n;i++) {
printf("%i\n",a[i]);
}
getch();
}
30:1
F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

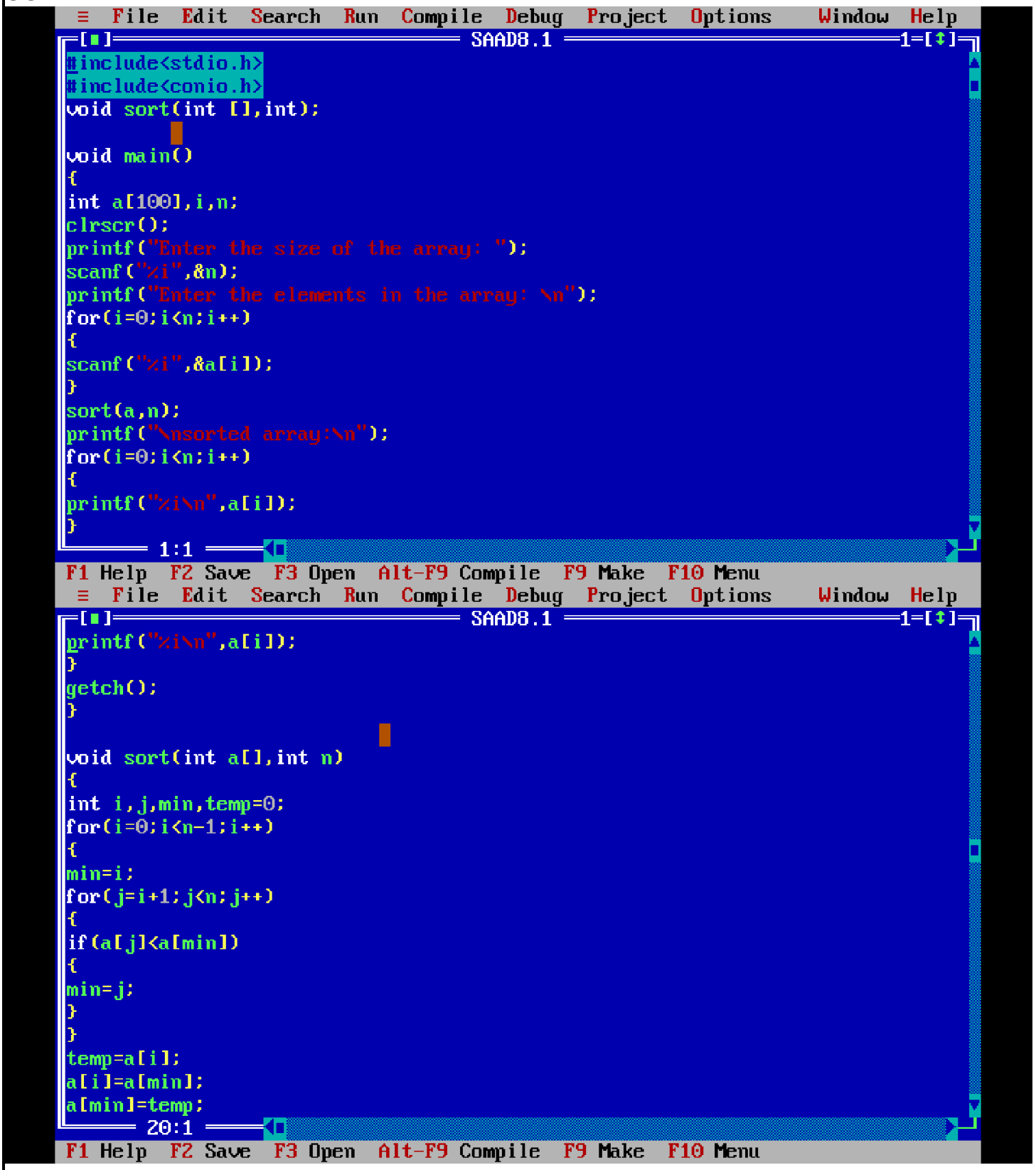
OUTPUT: -


Enter the size of the array: 5
Enter the elements in the array:
23
64
74
97
47
Sorted Array:
23
47
64
74
97

Practical Related Questions:

1. **Modify the Selection Sort algorithm to handle arrays containing negative numbers.**

CODE:



```
File  Edit  Search  Run  Compile  Debug  Project  Options  Window  Help
SAAD8.1
#include<stdio.h>
#include<conio.h>
void sort(int [],int);

void main()
{
int a[100],i,n;
clrscr();
printf("Enter the size of the array: ");
scanf("%i",&n);
printf("Enter the elements in the array: \n");
for(i=0;i<n;i++)
{
scanf("%i",&a[i]);
}
sort(a,n);
printf("\nsorted array:\n");
for(i=0;i<n;i++)
{
printf("%i\n",a[i]);
}
1:1
F1 Help  F2 Save  F3 Open  Alt-F9 Compile  F9 Make  F10 Menu
File  Edit  Search  Run  Compile  Debug  Project  Options  Window  Help
SAAD8.1
printf("%i\n",a[i]);
}
getch();
}

void sort(int a[],int n)
{
int i,j,min,temp=0;
for(i=0;i<n-1;i++)
{
min=i;
for(j=i+1;j<n;j++)
{
if(a[j]<a[min])
{
min=j;
}
}
temp=a[i];
a[i]=a[min];
a[min]=temp;
20:1
F1 Help  F2 Save  F3 Open  Alt-F9 Compile  F9 Make  F10 Menu
```

```
}
}
temp=a[i];
a[i]=a[min];
a[min]=temp;
}
}
```

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F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

OUTPUT:

```
Enter the size of the array: 5
Enter the elements in the array:
-3
-4
-1
-9
-7

sorted array:
-9
-7
-4
-3
-1
```

2. **Adapt the Selection Sort algorithm to sort an array of floating-point numbers.**

CODE:

```
≡ File Edit Search Run Compile Debug Project Options Window Help
[■] SAAD8.2 1=[↕]
#include<stdio.h>
#include<conio.h>

void sort(float [],int);

void main()
{
float a[100];
int i,n;
clrscr();
printf("Enter the size of the array: ");
scanf("%d",&n);
printf("Enter the elements in the array: \n");
for(i=0;i<n;i++)
{
scanf("%f",&a[i]);
}
sort(a,n);
printf("\nSorted Array: \n");
for(i=0;i<n;i++)
{
1:1
F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu
```

```
≡ File Edit Search Run Compile Debug Project Options Window Help
[■] SAAD8.2 1=[↕]
for(i=0;i<n;i++)
{
printf("%.2f\n",a[i]);
}
getch();
}

void sort(float a[],int n)
{
int i,j,min;
float temp=0;
for(i=0;i<n-1;i++)
{
min=i;
for(j=i+1;j<n;j++)
{
if(a[j]<a[min])
{
min=j;
}
}
40:1
F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu
```

```
}
}
temp=a[i];
a[i]=a[min];
a[min]=temp;
}
}
```

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F1 Help F2 Save F3 Open Alt-F9 Compile F9 Make F10 Menu

OUTPUT:

```
Enter the size of the array: 5
Enter the elements in the array:
2.1
2.9
2.7
2.3
2.4

Sorted Array:
2.10
2.30
2.40
2.70
2.90
```

Marks Obtained	Dated signature of Teacher

Process Related (35)	Product Related(15)	Total (50)	