

<b>Subject: - DSU</b>	<b>Subject Code: 313301</b>
<b>Semester: - III</b>	<b>Course: Computer Engineering</b>
Laboratory No: L003	<b>Name of Subject Teacher: Prof. Imran S.</b>
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<b>Experiment No:</b>	7
<b>Title of Experiment</b>	* Write a 'C' Program to Sort an Array of Strings using Bubble Sort Method

**Aim:** Write a 'C' Program to Sort an Array of Strings using Bubble Sort Method.

### Algorithm:

Step 1: Start  
Step 2: Declare a 2D character array a[5][20] and a temporary array temp[20]  
Step 3: Declare integer variables i, j, b  
Step 4: Clear screen using clrscr()  
Step 5: Print "Enter Strings in the Array:"  
Step 6: Run a loop from i = 0 to i < 5  
Step 6.1: Scan a string from keyboard and store it in a[i]  
Step 7: Run a loop from i = 0 to i < 4  
Step 7.1: Run a nested loop from j = 0 to j < 4 - i  
Step 7.1.1: Compare a[j] and a[j+1] using strcmp() and store result in b  
Step 7.1.2: If b > 0, then  
Step 7.1.2.1: Copy a[j] to temp  
Step 7.1.2.2: Copy a[j+1] to a[j]  
Step 7.1.2.3: Copy temp to a[j+1]  
Step 8: Print "Sorted Array:"  
Step 9: Run a loop from i = 0 to i < 5  
Step 9.1: Print a[i]  
Step 10: Stop

Code:

```
≡ File Edit Search Run Compile Debug Project Options Window Help
[■] SAAD57.C 1-[+]
```

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char a[5][20],temp[20];
int i,j,b;
clrscr();
printf("Enter Strings in the Array: \n");
for(i=0;i<5;i++)
{
scanf("%s",a[i]);
}
for(i=0;i<5-1;i++)
{
for(j=0;j<5-i-1;j++)
{
b=strcmp(a[j],a[j+1]);
if(b>0)
{
strcpy(temp,a[j]);
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```

```
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[■] SAAD57.C 1-[+]
```

```
strcpy(a[j],a[j+1]);
strcpy(a[j+1],temp);
}
}
}
printf("\nSorted Array: \n");
for(i=0;i<5;i++)
{
printf("%s \n",a[i]);
}
getch();
}
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```

```
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```

**Output: -**

```
Enter Strings in the Array:
```

```
e  
d  
c  
b  
a
```

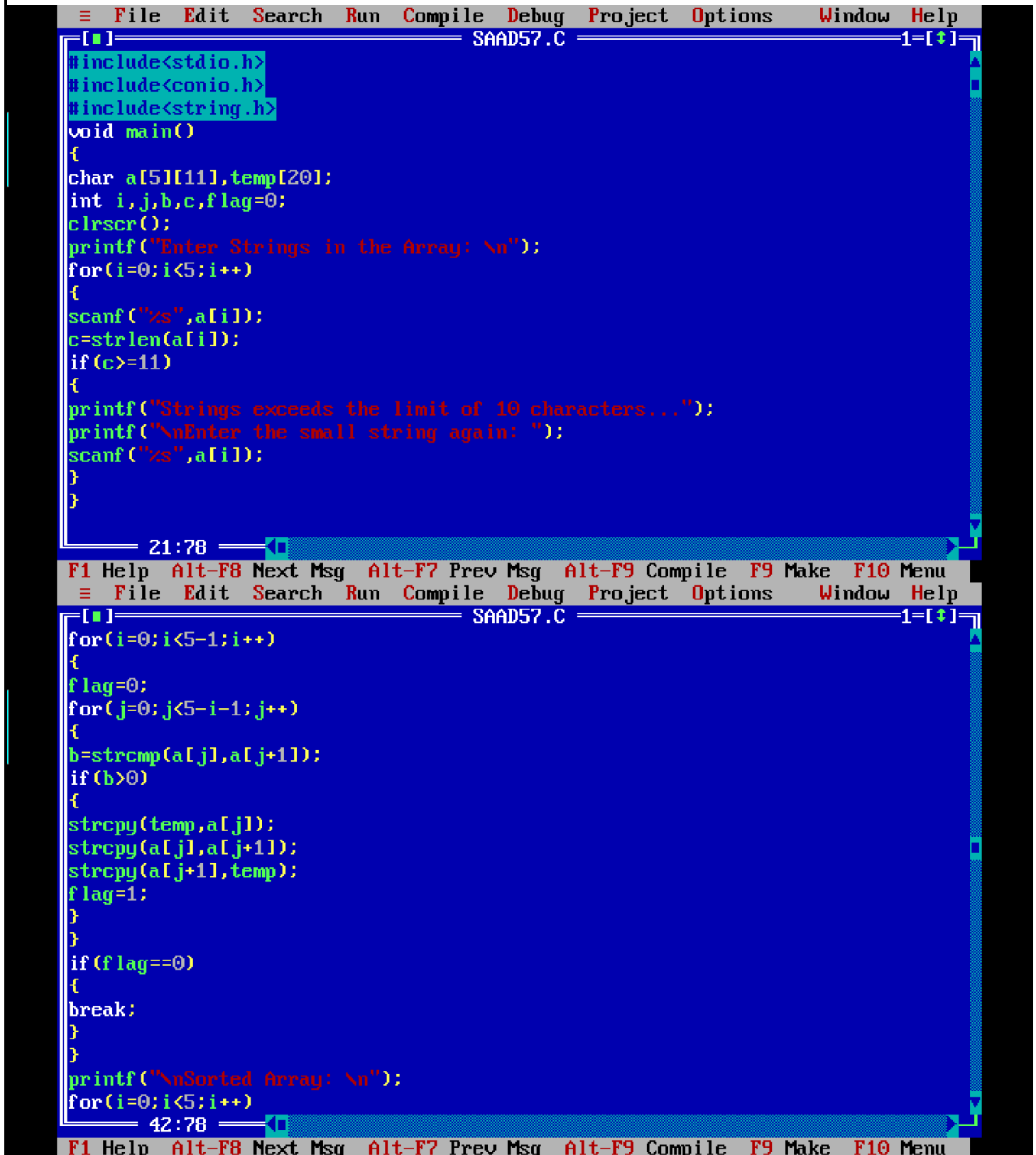
```
Sorted Array:
```

```
a  
b  
c  
d  
e  
-
```

### Practical Related Questions:

1. Modify the basic Bubble Sort algorithm to include an optimization that stops the algorithm if no swaps were made during a pass.

Ans:



```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char a[5][11],temp[20];
int i,j,b,c,flag=0;
clrscr();
printf("Enter Strings in the Array: \n");
for(i=0;i<5;i++)
{
scanf("%s",a[i]);
c=strlen(a[i]);
if(c>=11)
{
printf("Strings exceeds the limit of 10 characters...");
printf("\nEnter the small string again: ");
scanf("%s",a[i]);
}
}

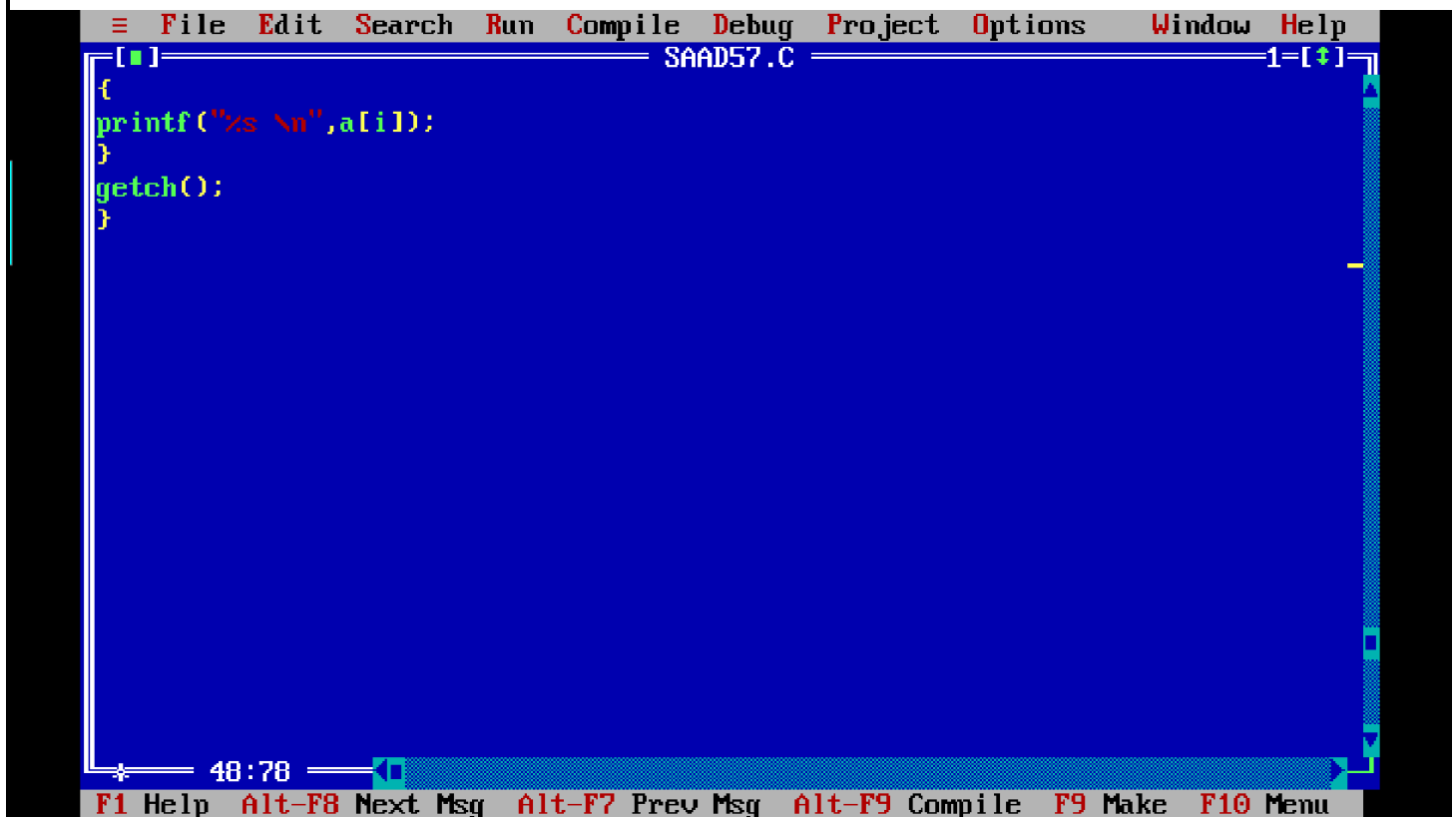
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for(i=0;i<5-1;i++)
{
flag=0;
for(j=0;j<5-i-1;j++)
{
b=strcmp(a[j],a[j+1]);
if(b>0)
{
strcpy(temp,a[j]);
strcpy(a[j],a[j+1]);
strcpy(a[j+1],temp);
flag=1;
}
}
if(flag==0)
{
break;
}
}
printf("\nSorted Array: \n");
for(i=0;i<5;i++)

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```



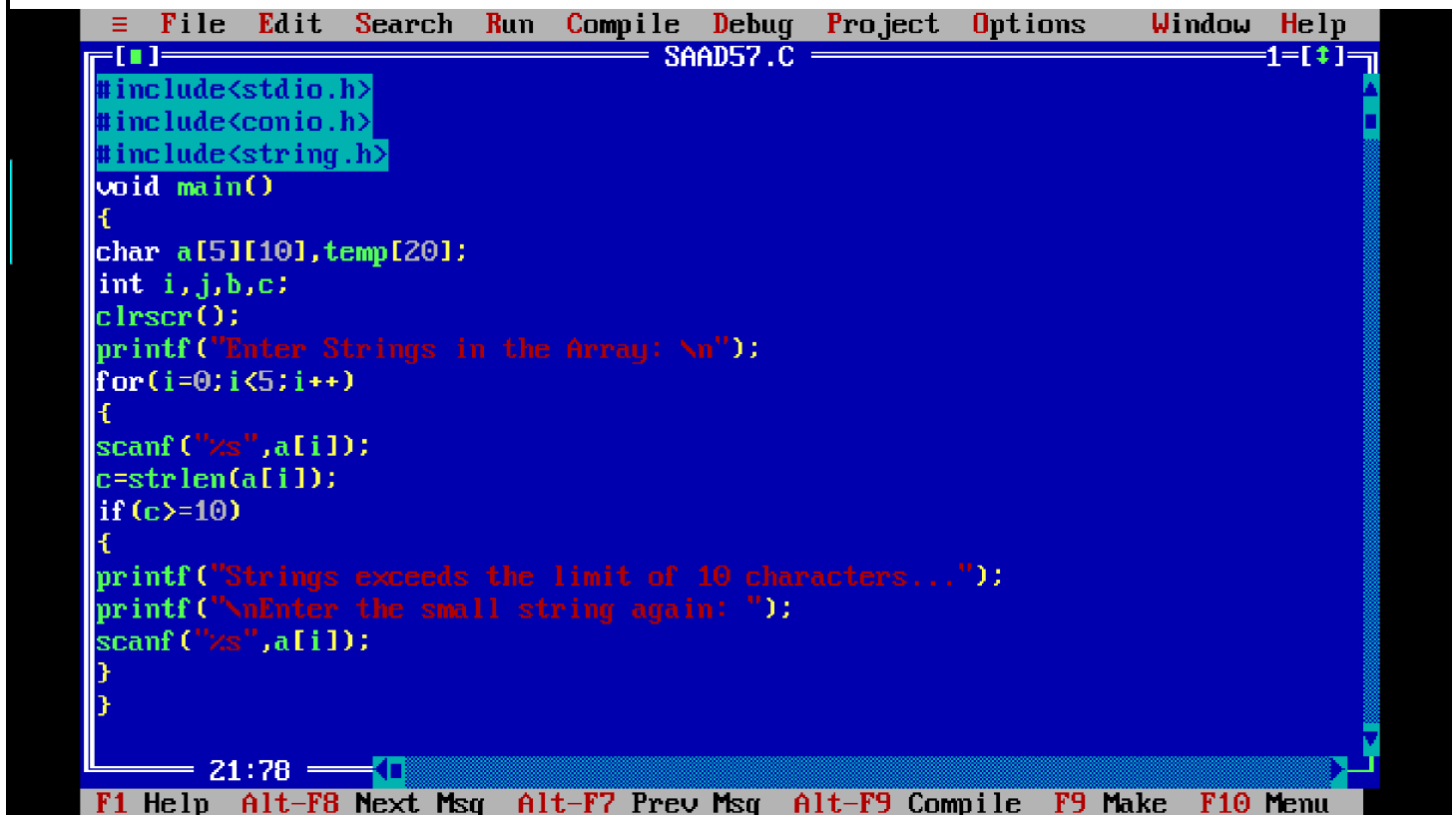
```
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SAAD57.C
{
printf("%s\n",a[i]);
}
getch();
}
```

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2. Modify the program to handle invalid input, such as non-string data or strings that exceed the maximum length.

Ans:



```
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SAAD57.C
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main()
{
char a[5][10],temp[20];
int i,j,b,c;
clrscr();
printf("Enter Strings in the Array: \n");
for(i=0;i<5;i++)
{
scanf("%s",a[i]);
c=strlen(a[i]);
if(c>=10)
{
printf("Strings exceeds the limit of 10 characters...");
printf("\nEnter the small string again: ");
scanf("%s",a[i]);
}
}
}
```

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```
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SAAD57.C
1-[]
for(i=0;i<5-1;i++)
{
for(j=0;j<5-i-1;j++)
{
b=strcmp(a[j],a[j+1]);
if(b>0)
{
strcpy(temp,a[j]);
strcpy(a[j],a[j+1]);
strcpy(a[j+1],temp);
}
}
}
printf("\nSorted Array: \n");
for(i=0;i<5;i++)
{
printf("%s \n",a[i]);
}
getch();
}
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```

**Output:**

```
Enter Strings in the Array:
helloworld
helloworld!
Strings exceeds the limit of 10 characters...
Enter the small string again: hiworld
namaste
what
why

Sorted Array:
helloworld
hiworld
namaste
what
why
-
```

Marks Obtained			Dated signature of Teacher
Process Related (35)	Product Related (15)	Total (50)	