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Experiment No.	4

AIM:	Demonstrate the use of one-dimensional arrays to solve a given problem

Program 1	

PROBLEM STATEMENT :	Write a program to find the maximum element of an array
ALGORITHM:	1)start 2)print "Enter the Number of Subjects" 3)input "n" 4)marks[n]--array 5)print "Enter the marks in n Subjects" 6)read_array(marks,n) 7)print "The maximum marks is: find_max(marks,n)" 8)stop 1)read_array(marks,n) 2)i<--0 3)if i>=n GOTO STEP 6 4)input "marks[i]"--array 5)i++ GOTO STEP 3 6)end 1)find_max(marks,n) 2)max<--marks[0] 3)i<--1 4)if i>=n GOTO STEP 9 5)if marks[i]>max GOTO STEP 7 6)max<--max

	7)max<--marks[i] 8)i++ GOTO STEP 4 8)return max

PROGRAM:	```c
	#include<stdio.h>
	void read_array(float m[],int);
	void print_array(float [],int);
	float compare_array(float m[],int n);
	int main()
	{
	        int n;
	        float max;
	        printf("Enter the no. of subjects : ");
	        scanf("%d",&n);
	        float marks[n];
	        printf("\n Enter the marks in %d subjects : ",n);
	        read_array(marks,n);
	        printf("\n The marks are : ");
	        print_array(marks,n);
	        printf("\n");
	        max=compare_array(marks,n);
	        printf("The maximum marks is :%2f ",max);
	        printf("\n");
	        return 0;
	}
	void read_array(float m[],int n)
	{
	        for(int i=0;i<n;i++)
	                scanf("%f",&m[i]);
	}
	void print_array(float m[],int n)
	{
	        for(int i=0;i<n;i++)
	                printf(" %.2f ",m[i]);
	}
	float compare_array(float m[],int n)
	        {
	        float max=m[0];
	        for(int i=0;i<n;i++)
	                if(m[i]>max)
	``

	max=m[i];
	return max;
	}

RESULT:

```
psipl@psipl-OptiPlex-3000:~/Desktop/2023300065$ gcc max_marks_array.c
psipl@psipl-OptiPlex-3000:~/Desktop/2023300065$ ./a.out
Enter the no. of subjects : 5

 Enter the marks in 5 subjects : 10 20 30 40 50

 The marks are :   10.00    20.00     30.00     40.00     50.00
The maximum marks is :50.000000
psipl@psipl-OptiPlex-3000:~/Desktop/2023300065$
```

Program 2

PROBLEM STATEMENT :	Write a program to sort an array in ascending order using selection sort algorithm
ALGORITHM:	1)start 2)print "Enter number of subjects" 3)input "n" 4)marks[n]---//array// 5)print "Enter the marks in n Subjects" 6)read_array(marks,n) 7)print "The marks are:" 8)print_array(marks,n) 9)print "The Sorted Marks are" 10)sorted_array(marks,n) 1)read_array(marks,n) 2)i<--0 3)IF i>=n GOTO STEP 6 4)input "marks[i]"--array 5)i++ GOTO STEP 3

	6)end 1)print_array(marks,n) 2)i<--0 3)IF i>=n GOTO STEP 6 4)print "marks[i]"--array 5)i++ GOTO STEP 3 6)end 1)sorted_array(marks,n) 2)i<--0 3)IF i>=n GOTO STEP 17 4)min_index<--i 5)j<--i+1 6)if j>=n GOTO STEP 13 9)if marks[j]<marks[min_index] GOTO STEP 11 10)min_index<--min_index 11)min_index<--j 12)j++ GOTO STEP 6 13)t<--marks[i] 14)marks[i]<--marks[min_index] 15)marks[min_index]<--t 16)i++ GOTO STEP 3 17)print_array(marks,n) 18) stop

PROGRAM:	```c
	#include<stdio.h>
	void read_array(float m[],int);
	void print_array(float [],int);
	float compare_array(float m[],int n);
	void sort_array(float [],int);
	int main()
	{
	        int n;
	        float max;
	        printf("Enter the no. of subjects : ");
	        scanf("%d",&n);
	        float marks[n];
	        printf("\n Enter the marks in %d subjects : ",n);
	        read_array(marks,n);
	        printf("\n The marks are : \n");
	        print_array(marks,n);
	``

```c
        sort_array(marks,n);
        printf("\n");
        printf("\n The sorted marks are : \n");
        print_array(marks,n);
        printf("\n");
        return 0;
}
void read_array(float m[],int n)
{
        for(int i=0;i<n;i++)
                scanf("%f",&m[i]);
}
void print_array(float m[],int n)
{
        for(int i=0;i<n;i++)
                printf(" %.2f ",m[i]);
}
float compare_array(float m[],int n)
        {
        float max=m[0];
        for(int i=0;i<n;i++)
                if(m[i]>max)
                max=m[i];

                return max;
        }
                void sort_array(float m[],int n)
                {
                for(int i=0;i<n-1;i++)
                        {
                        int min_idx=i;
                        for(int j=i+1;j<n;j++)
                         if(m[j]<m[min_idx])
                        min_idx=j;

                        float temp=m[i];
                        m[i]=m[min_idx];
                        m[min_idx]=temp;
                        }
}
```

RESULT:	
The sorted marks are : 6.00 12.00 23.00 43.00 98.00	
CONCLUSION:	From this experiment I have learnt the arrays and sort operations. Also learned user defined functions for reading, printing and for sorting maximum/minimum values.