ASSIGNMENT NO:3 **DATE:06/09/2014**

PROGRAM TITLE: Find the maximum, minimum, mean and standard deviation of an array of 10 integers.

PROGRAM ALGORITHM:

```
algo standard_deviation()
{
      initialize sum to zero
      for(i=1 to 10)
      {
            input array elements
            add element to sum
      }
      initialize max and min to first element of array
      calculate mean
      reset sum to zero
      for(i=1 to 10)
      {
            add square of element minus mean to sum
            calculate max
            calculate min
      }
      calculate std
      print max
      print min
      print mean
      print std
}
```

PROGRAM CODE:

```
/* C Program to find Max, Min, Mean and Standard Deviation of an array of
10 numbers*/
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#define ARRSIZE (10)
int main()
{
      int i;
      float a[ARRSIZE],max,min,mean,std,sum=0;

      /*Read the inputs*/
      printf("Enter the numbers:\n");
      for(i=0;i<ARRSIZE;i++)
      {
            scanf("%f",&a[i]);
            sum=sum+a[i];
      }
      max=min=a[0];
      mean=sum/ARRSIZE;
      sum=0;
```

```
	/*Calculating Standard Deviation and finding Maximum and Minimum*/
	for(i=0;i<ARRSIZE;i++)
	{
		sum=sum+pow(a[i]-mean,2);
		if(a[i]>max)
		{
			max=a[i];
		}
		if(a[i]<min)
		{
			min=a[i];
		}
	}
	std=sqrt(sum/ARRSIZE);

	/*Printing the Results*/
	printf("The Maximum is :%8.2f\nThe Minimum is :%8.2f\nThe Mean is :
%8.2f\nThe Standard Deviation is :%8.2f\n",max,min,mean,std);
	return 0;
}
```

OUTPUT:

Set 1:

```
Enter the numbers:
1 2 3 4 5 6 7 8 9 10
The Maximum is :   10.00
The Minimum is :    1.00
The Mean is :    5.50
The Standard Deviation is :    2.87
```

Set 2:

```
Enter the numbers:
2.3 5.6 8.9 0.2 4.5 4 9 156 84 -10
The Maximum is :  156.00
The Minimum is :  -10.00
The Mean is :   26.45
The Standard Deviation is :   49.73
```

DISCUSSION:

Though the question says to read an array of 10 integers, this Program works for float variables as well. Also, in Set 2 of the outputs, we see that it functions well with negative numbers also.