Aim:

Write a program to sort (ascending order) the given elements using shell sort technique.

At the time of execution, the program should print the message on the console as:

```
Enter array size :
```

For example, if the user gives the **input** as:

```
Enter array size : 5
```

Next, the program should print the following message on the console as:

```
Enter 5 elements :
```

if the user gives the **input** as:

```
Enter 5 elements : 34 67 12 45 22
```

then the program should **print** the result as:

```
Before sorting the elements are : 34 67 12 45 22
After sorting the elements are : 12 22 34 45 67
```

Note: Do use the **printf()** function with a **newline** character (\n).

Source Code:

ShellSort2.c

```c
#include <stdio.h>
#include <conio.h>
int main() {
    int size;
    int *arr, i;
    printf("Enter array size : ");
    scanf("%d",&size);
    arr = (int*) malloc(size * sizeof(int));
    printf("Enter %d elements : ",size);
    for(i = 0; i < size; i++) {
        scanf("%d",&arr[i]);
    }
    printf("Before sorting the elements are : ");
    printArray(arr,size);

    shellSort(arr,size);

    printf("After sorting the elements are : ");
    printArray(arr,size);
    return 0;
}
int shellSort(int arr[],int n)
{
    int gap, i, j, temp;
```

```
    for(gap=n/2;gap>0;gap/=2) {
        for(i=gap;i<n;i++) {
            temp = arr[i];
            for(j=i;j>=gap && arr[j-gap]>temp;j-=gap) {
                arr[j] = arr[j-gap];
            }
            arr[j] = temp;
        }
    }
}
void printArray(int arr[],int n) {
    for(int i=0;i<n;i++) {
        printf("%d ",arr[i]);
    }
    printf("\n");
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter array size : 5
Enter 5 elements : 12 32 43 56 78
Before sorting the elements are : 12 32 43 56 78
After sorting the elements are : 12 32 43 56 78