

# Rajalakshmi Engineering College

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## NeoColab\_REC\_CS23231\_DATA STRUCTURES

### REC\_DS using C\_Week 6\_COD\_Question 2

Attempt : 1  
Total Mark : 10  
Marks Obtained : 10

#### Section 1 : Coding

##### 1. Problem Statement

Nandhini asked her students to arrange a set of numbers in ascending order. She asked the students to arrange the elements using insertion sort, which involves taking each element and placing it in its appropriate position within the sorted portion of the array.

Assist them in the task.

##### ***Input Format***

The first line of input consists of the value of n, representing the number of array elements.

The second line consists of n elements, separated by a space.

##### ***Output Format***

The output prints the sorted array, separated by a space.

Refer to the sample output for formatting specifications.

### **Sample Test Case**

Input: 5

67 28 92 37 59

Output: 28 37 59 67 92

### **Answer**

```
#include <stdio.h>
```

```
// You are using GCC
```

```
#include <stdio.h>
```

```
/* ----- insertion sort ----- */
```

```
void insertionSort(int arr[], int n)
```

```
{
```

```
    for (int i = 1; i < n; ++i)
```

```
    {
```

```
        int key = arr[i];
```

```
        int j  = i - 1;
```

```
        /* shift all larger elements one position to the right */
```

```
        while (j >= 0 && arr[j] > key)
```

```
        {
```

```
            arr[j + 1] = arr[j];
```

```
            --j;
```

```
        }
```

```
        arr[j + 1] = key;    /* place key in its correct spot */
```

```
    }
```

```
/* ----- utility: print array ----- */
```

```
void printArray(int arr[], int n)
```

```
{
```

```
    for (int i = 0; i < n; ++i)
```

```
    {
```

```
        printf("%d", arr[i]);
```

```
        if (i != n - 1) printf(" "); /* no trailing space */  
    }  
}
```

```
int main() {  
    int n;  
    scanf("%d", &n);  
    int arr[n];  
    for (int i = 0; i < n; i++) {  
        scanf("%d", &arr[i]);  
    }  
  
    insertionSort(arr, n);  
    printArray(arr, n);  
    return 0;  
}
```

**Status :** Correct

**Marks :** 10/10