EXERCISE 16

Write a C program to arrange a series of numbers using Insertion Sort

Aim:

To write a C program to sort a series of numbers using the **Insertion Sort** algorithm.

Algorithm:

1. Start from the second element (index 1) of the array.
2. Compare the current element with the previous elements.
3. Shift all larger elements one position to the right.
4. Insert the current element at its correct position.
5. Repeat steps 2–4 until the entire array is sorted.

Program:

```
#include <stdio.h>
void insertionSort(int arr[], int n) {
   int i, key, j;
   for (i = 1; i < n; i++) {
      key = arr[i];
      j = i - 1;
      while (j >= 0 && arr[j] > key) {
         arr[j + 1] = arr[j];
         j = j - 1;
      }
      arr[j + 1] = key;
   }
}
void display(int arr[], int n) {
   printf("Sorted array:\n");
```

```
    for (int i = 0; i < n; i++)
        printf("%d ", arr[i]);
    printf("\n");
}
int main() {
    int arr[50], n;
    printf("Enter number of elements: ");
    scanf("%d", &n);
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++)
        scanf("%d", &arr[i]);
    insertionSort(arr, n);
    display(arr, n);
    return 0;
}
```

Input and Output:

```
Enter number of elements: 5
Enter 5 elements:
34 5 12 62 22
Sorted array:
5 12 22 34 62


=== Code Execution Successful ===
```

RESULT:

The series of numbers has been successfully sorted using the Insertion Sort method.