DAY-5 ASSIGNMENT | 29th December, 2020

1. Problem Statement:
Write the function for insertion sort.

Function:
```
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;
   }
}
```

Implementation:
```
#include <stdio.h>
#include <math.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;
   }
}
int main()
{
   int n,i,arr[100];
   printf("Enter the size of the array: ");
   scanf("%d",&n);
   printf("Enter the elements of the array:");
   for(i=0; i<n; i++)
```

```
    {
      scanf("%d",&arr[i]);
    }
    insertionSort(arr, n);
    printf("After sorting:");
    for(i=0; i<n; i++)
    {
      printf("%d ",arr[i]);
    }
return 0;
}
```

Output:

```
Enter the size of the array: 5
Enter the elements of the array:7 4 85 96 45
After sorting:4 7 45 85 96
```

Time Complexity:

As we are using 2 for loops, the worst case complexity is O(n^2).