

# Day-23

## Python DSA

### Bubble Sort

<https://www.geeksforgeeks.org/problems/bubble-sort/1>

class Solution:

```
def bubbleSort(self,arr):
```

```
    n = len(arr)
```

```
    for i in range(n-1, 0,-1):
```

```
        swap=False
```

```
        for j in range(i):
```

```
            if arr[j] > arr[j+1]:
```

```
                swap=True
```

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

```
        if not swap:
```

```
            Return
```

Best Case  $\rightarrow O(N)$

Average/Worst Case  $\rightarrow O(N^2)$

Space Complexity  $\rightarrow O(1)$

### Insertion Sort

<https://www.geeksforgeeks.org/problems/insertion-sort/1>

class Solution:

```
def insertionSort(self, arr):  
    for i in range(1, len(arr)):  
        key = arr[i]  
        j=i-1  
        while j >=0 and arr[j] > key:  
            arr[j+1]= arr[j]  
            j-=1  
        arr[j+1]=key
```

Best Case  $\rightarrow O(N)$

Average Case  $\rightarrow O(N^2)$

Worst Case  $\rightarrow O(N^2)$

Space Complexity  $\rightarrow O(1)$