

## DSA LAB

### Lab Assignment number 17

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**Batch:** A

**Roll no:** 01

**AIM:** To implement Selection sort and Insertion sort

#### ALGORITHM:

##### Selection Sort:

```
S 1: READ n and Elements in array
S 2: [INITIALIZE] i=0
S 3: Repeat following while i<n-1
    SET min = i
    [INITIALIZE] j=i+1
    Repeat following while j<n
        IF array[j] < array[min]
            SET min = j
        SET j++
    swap(&array[min], &array[i])
    SET i++
S 4: EXIT

swap(int *a, int *b):
S 1: SET temp = *a
S 2: SET *a = *b
S 3: SET *b = temp
S 4: EXIT
```

##### Insertion Sort:

```
S 1: READ n and Elements in array
S 2: [INITIALIZE] i=1
S 3: Repeat following while i<=n-1
    SET temp = array[i]
    [INITIALIZE] j=i-1
    Repeat following while j>=0
        IF array[j] > temp
            SET array[j+1] = array[j]
            SET flag = 1
        ELSE
            break
    SET j--
    IF flag == 1
        SET array[j+1] = temp
    SET i++
S 4: EXIT
```

**EXAMPLE:**

array[5] = { 17 , 5 , 67 , 45 , 22 }

Selection Sort:

For i=0; 5, 17 , 67 , 45 , 22

For i=1; 5, 17 , 67 , 45 , 22

For i=2; 5, 17 , 22 , 45 , 67

For i=3; 5, 17 , 22 , 45 , 67

For i=4; 5, 17 , 22 , 45 , 67

Sorted Array : 5, 17 , 22 , 45 , 67

Insertion Sort:

For i=1; 5, 17 , 67 , 45 , 22

For i=2; 5, 17 , 67 , 45 , 22

For i=3; 5, 17 , 45 , 67 , 22

For i=4; 5, 17 , 22 , 45 , 67

Sorted Array : 5, 17 , 22 , 45 , 67