**DSA LAB**

**Lab Assignment number 17**

**Name:** Aamir Ansari  **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