INSERT SORTED

Insert Sorted ( ):

Description: Here **A** is a sorted linear array (in ascending order) with **N** elements. **ITEM** is the value to be inserted.

```
1.   Set I = N                                  [Initialize counter]
2.   Repeat While (ITEM < A[I]) and (I >= 1)
3.        Set A[I+1] = A[I]                    [Move elements downward]
4.        Set I = I - 1                        [Decrease counter by 1]
     [End of While Loop]
5.   Set A[I+1] = ITEM                         [Insert element]
6.   Set N = N + 1                             [Reset N]
7.   Exit
```

Explanation: Here `A` is a sorted array stored in memory. This algorithm inserts a data element `ITEM` into the $(I + 1)^{th}$ position in an array `A`. `I` is initialized from `N` i.e. from total number of elements. `ITEM` is compared with each element until it finds an element which is smaller than `A[I]` or it reaches the first element. During this process, the elements are moved downwards and `I` is decremented. When it finds an element smaller then `ITEM`, it inserts it in the next location i.e. `I + 1` because `I` will be one position less where `ITEM` is to be inserted. And finally, total number of elements is increased by `1`.