

Insertion sort

Insertion is one way to sort an array of numbers. Data is divided into sorted and unsorted portions. One by one, the unsorted values are inserted into their appropriate positions in the sorted subarray.

Working of the algorithm :

To sort an array of size n in ascending order:

- 1: Iterate from $arr[0]$ to $arr[n-1]$.
- 2: Compare the current element to the element just before it.
- 3: If the key element is smaller than the element before it, compare it to the elements before. Move the greater elements one position up to make space for the swapped element.

Pseudo Code :

```
insertionSort( A : array of numbers )
  int holePosition
  int valueToInsert

  for i = 1 to length(A) inclusive do:
    valueToInsert = A[i]
    holePosition = i

    // locate hole position for the element to be inserted

    while holePosition > 0 and A[holePosition-1] > valueToInsert do:
      A[holePosition] = A[holePosition-1]
      holePosition = holePosition - 1
    end while

    // insert the number at hole position
    A[holePosition] = valueToInsert

  end for

end procedure
```