INSERTION SORT

2	6	9	12	15	7

n

0   1   2   3   4   5

Everything in ascending
order

Situation:

* You have an array which has all
  the elements uptil the 2nd last index
  ($(n-2)^{th}$ index) arranged in ascending
  order.
* Only the last element is not present at its correct place.

cur_ele = 7

cur_idx = 5

We start from (cur_idx - 1) & check

Is (arr [cur_idx - 1] > arr [cur_idx]) ?

If true, update arr [cur_idx]
to arr [cur_idx - 1])

Instead of swapping, you save the
cur_ele & check, overwrite the
arr [cur_idx].

7   1   9   3   6   18   2

$\longleftrightarrow$

i = 1

Assuming zeroth index is
already sorted.

cur_ele = 1
cur_idx = 1

j = i - 1

Is (arr[j] > arr[cur_idx]) {
    arr[cur_idx] = arr[j];
}

```
if (arr[j] > cur_ele){
    arr[j+1] = arr[j];
    j--;
}
arr[j+1] = cur_ele;
```

Time Complexity:

Worst case : $O(n^2)$

what if the array is almost or
already sorted ?

$\Omega(n)$

Space Complexity:

In-place

$O(1)$

Stability :

Stable