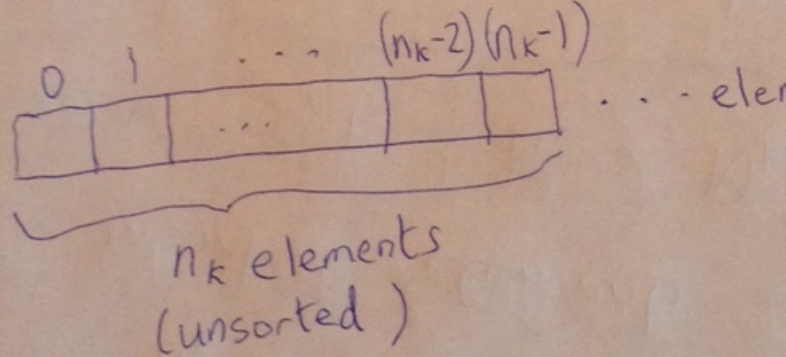
On pass k of a bubblesort algorithm, the top $k-1$ elements are already sorted.

If there are n elements in total, the number of unsorted elements is $n-(k-1)$

$= n-k+1$

Let $n_k = n-k+1$ = # of unsorted

So, on pass k over the array, only need to pass over (and attempt to sort) the first n_k elements. In C++ these are indexed starting from zero



Algorithm at pass k

Start at element $i = 0$

Loop {
- compare (element i) with (element i+1)
- If (element i) > (element i+1)
  - swap values of elements i and i+1
- Increment i by 1 (i++)

When do we stop?

If we continue until $i = (n_k - 1)$, there is no element stored in position $i+1$ to compare with. ∴ stop before reaching element $i = n_k - 1$

or, since $n_k = n - k + 1$, stop before reaching $i = (n - k + 1) - 1 = n - k$

Modify for loop (the inner for loop) to:

```
for(int i=0; i < n-k; i++)
```