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A proof on bubble sort

A sorted set is defined as follows (Where S_0 is the initial element):

$$S_k \leq S_{k+1} \vee$$
$$S_k = |S| - 1$$

```
procedure bubbleSort(S : Ordered set)
    swapped ← true
    while swapped
        swapped ← false
        for n → |S| - 2
            if S_n > S_{n+1}
                Swap(S_n, S_{n+1})
                swapped ← true
```