

Sorting →

↓ ↓ ↓ ↓ ↓ ↓
4 1 5 2 10 3

↓ ↓ ↓ ↓ ↓ ↓
1 2 5 4 10 3

Bubble Sort → $O(N^2)$ → Comparison based

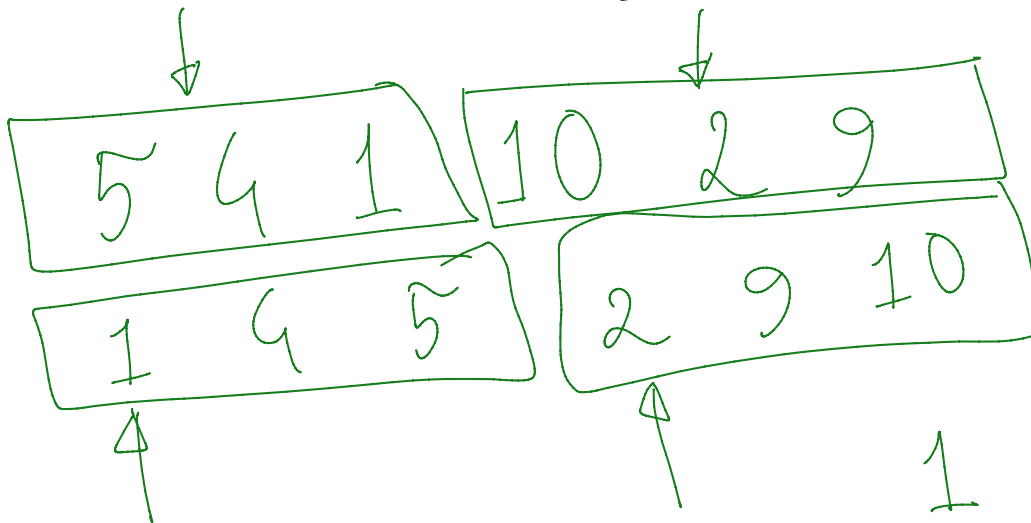
$\binom{n}{2} = \frac{n!}{(n-2)!2!} = \frac{n(n-1)}{2} \approx n^2$

```
void bubble-sort(vector<int> &vc) {
    for(int i=0; i<n; i++)
        for(int j=i+1; j<n; j++)
            if(vc[i] > vc[j])
                swap(vc[i], vc[j]);
}
```

Insertion Sort

key = 2

arr[j] = 1
key = 2



$O(N \cdot K)$



1 2 3 4 5
2 2 2 0 2

$V_0 \sim V_3 \leq V_4$

$V_0 \sim V_3 \leq V_4 \leq V_5$

1 2 2 3 4 5

a → 1
b → 1
c → 0
i → 1
j → 1