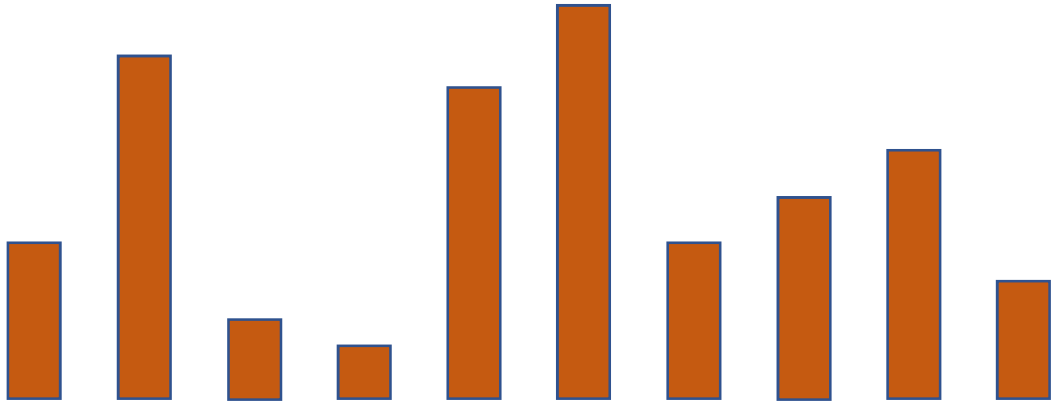
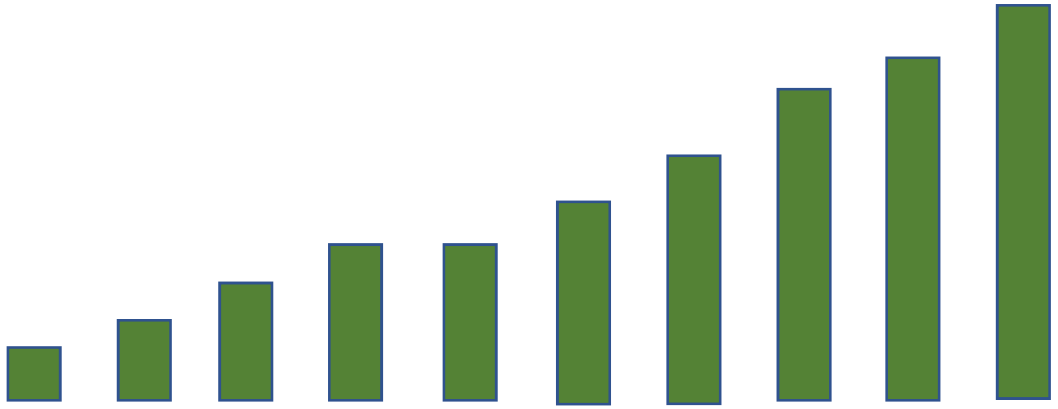
# Algoritmi di ordinamento

**INPUT**

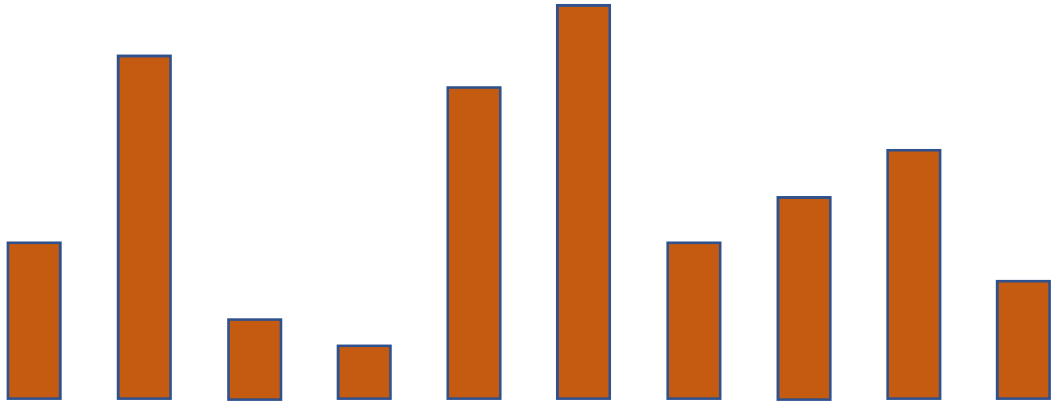


**OUPUT**

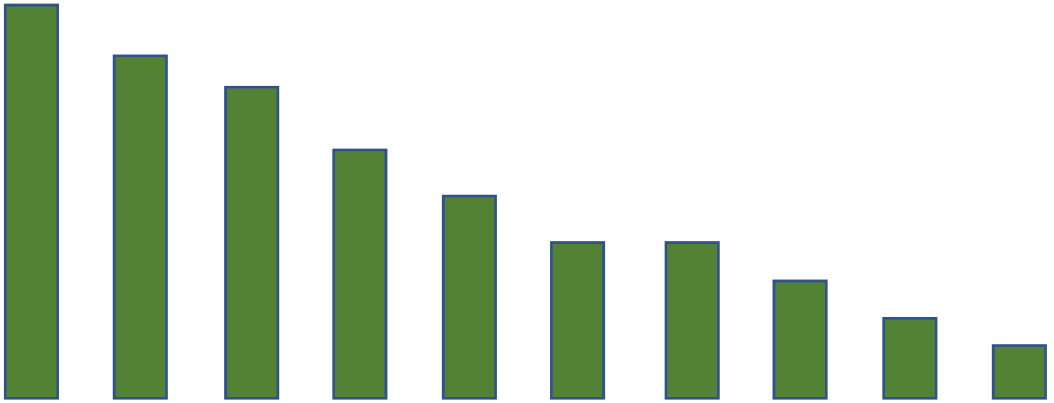


# Algoritmi di ordinamento

**INPUT**

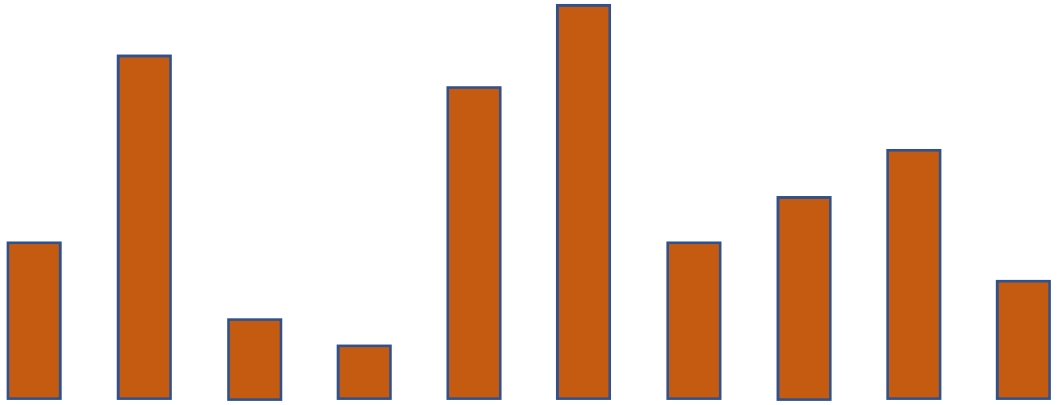


**OUPUT**



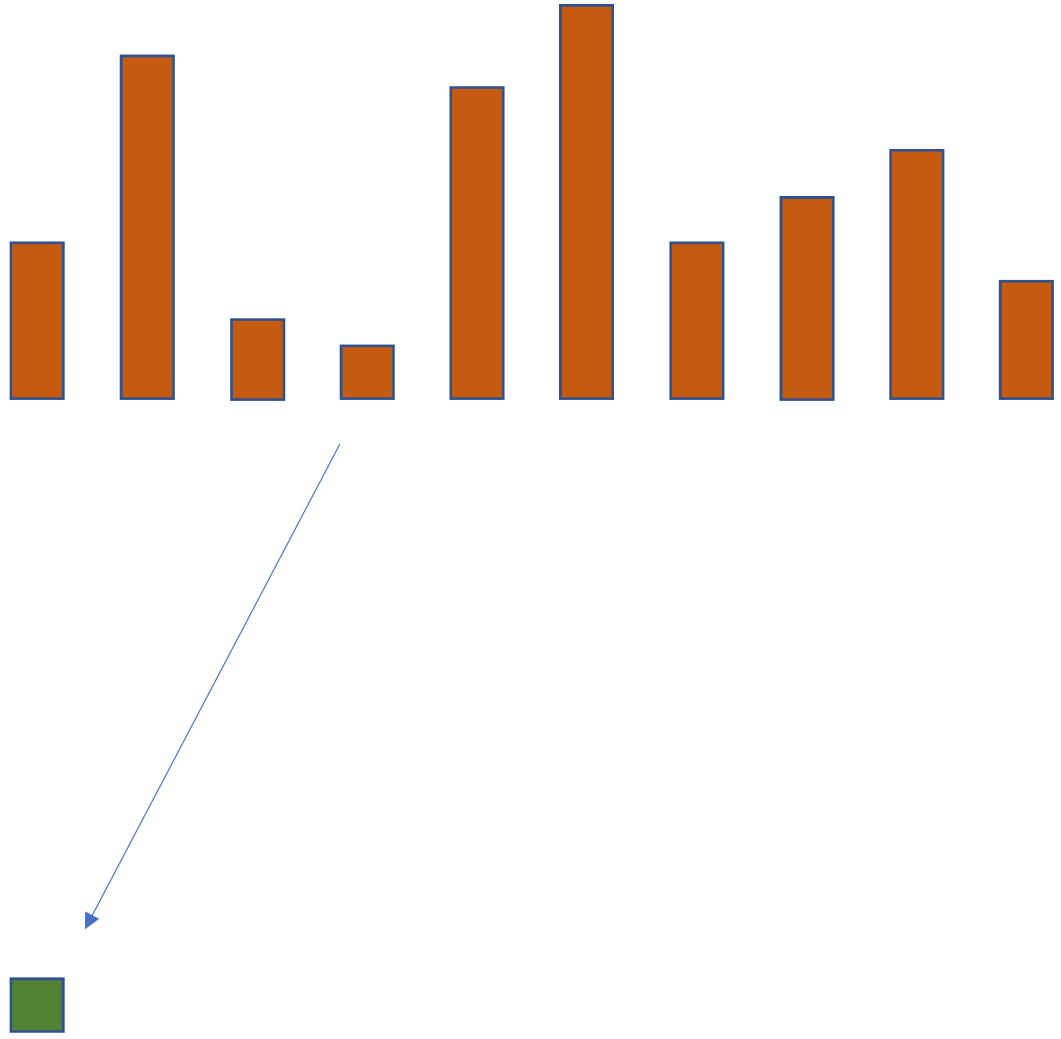
# Selection Sort

**INPUT**



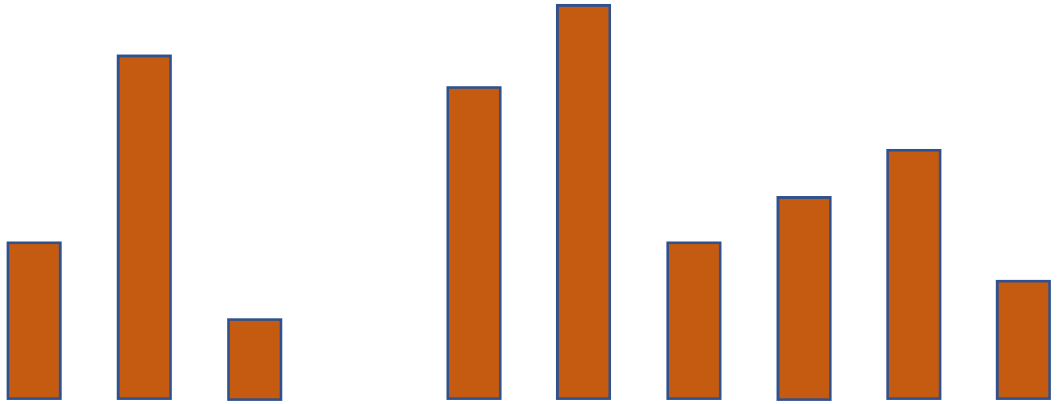
# Selection Sort

**INPUT**



# Selection Sort

**INPUT**



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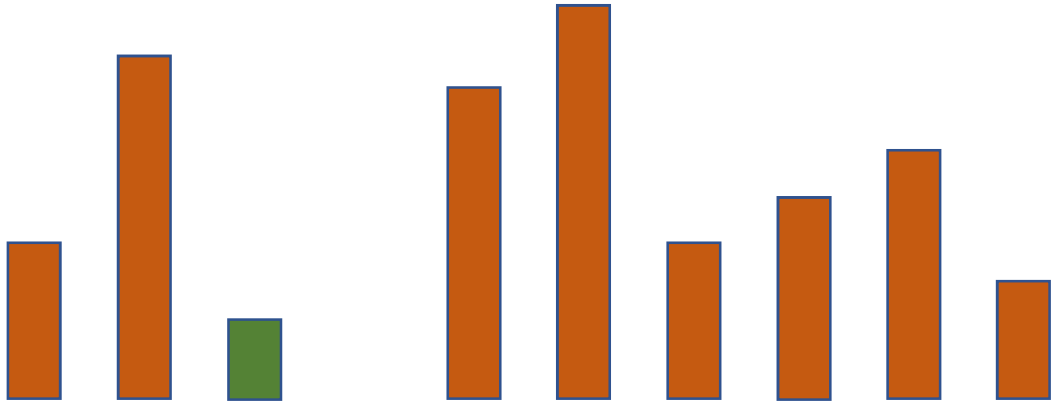

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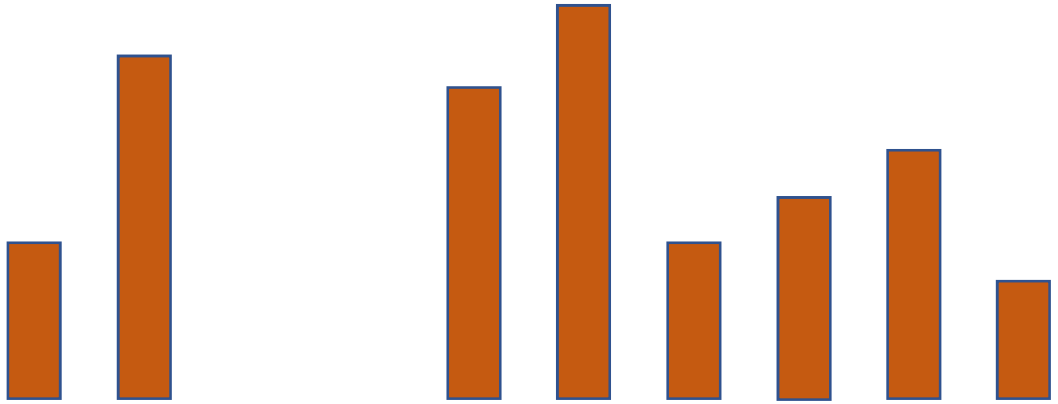
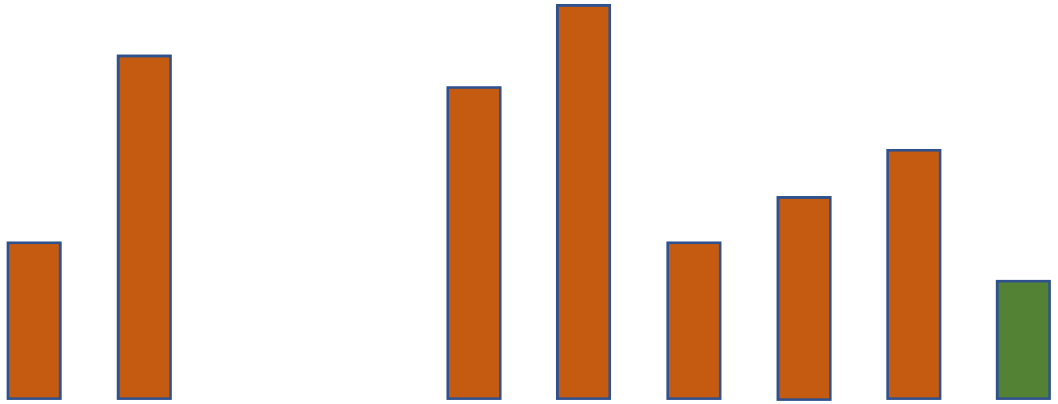


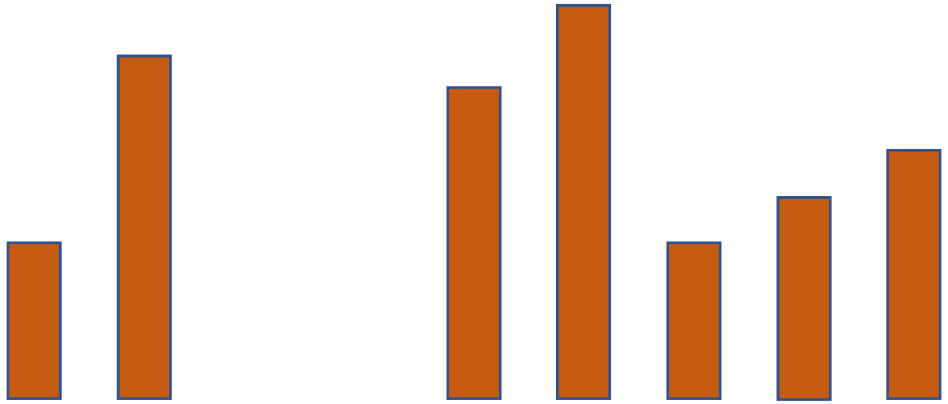
# Selection Sort

**INPUT**



# Selection Sort

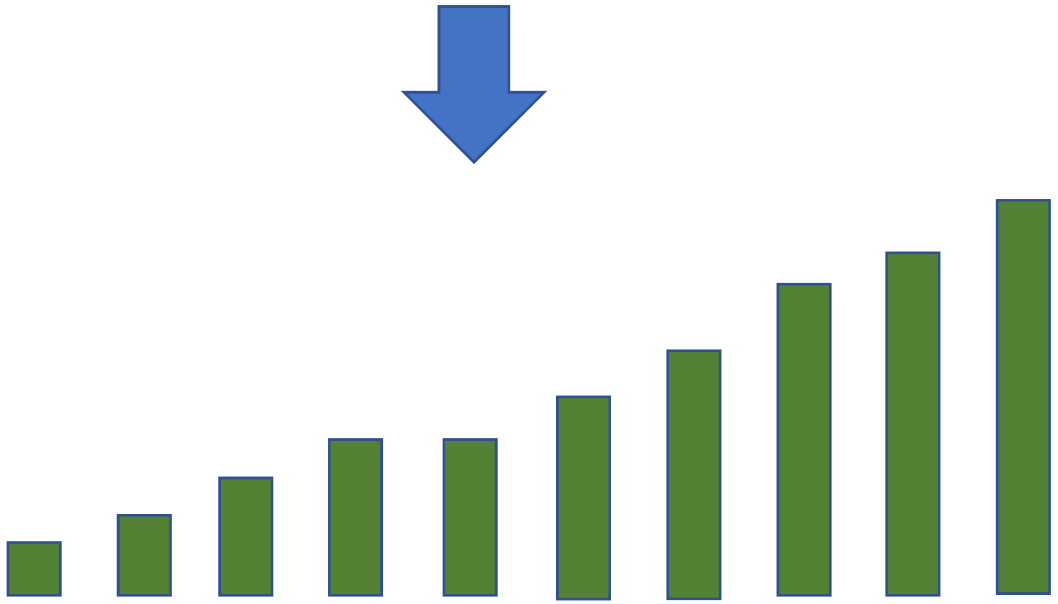
**INPUT**



# Algoritmi di ordinamento

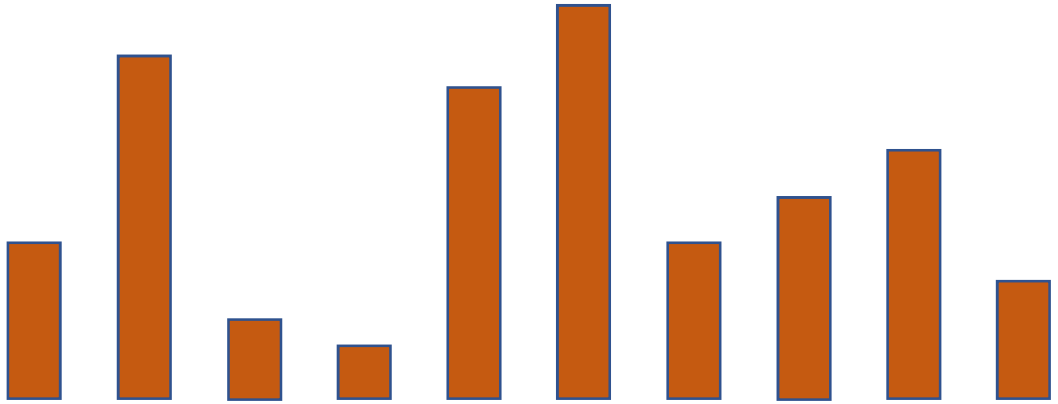
**INPUT**

**OUPUT**

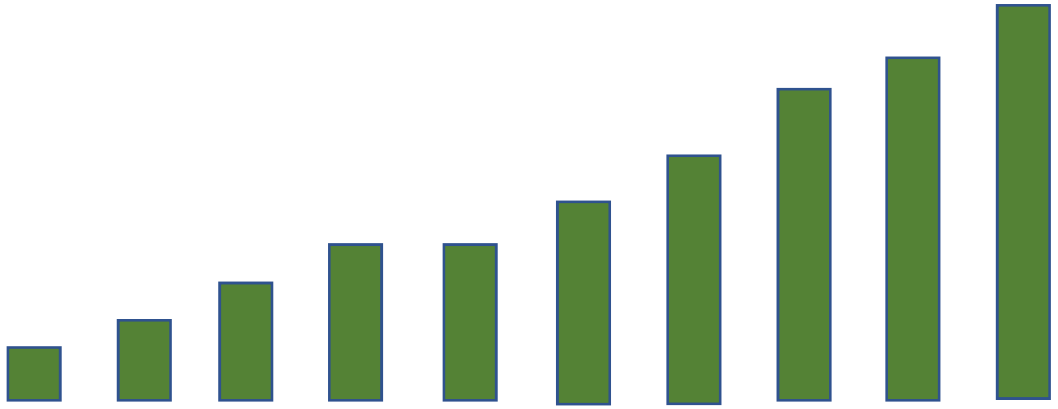


# Algoritmi di ordinamento

**INPUT**



**OUPUT**



# Algoritmi di ordinamento

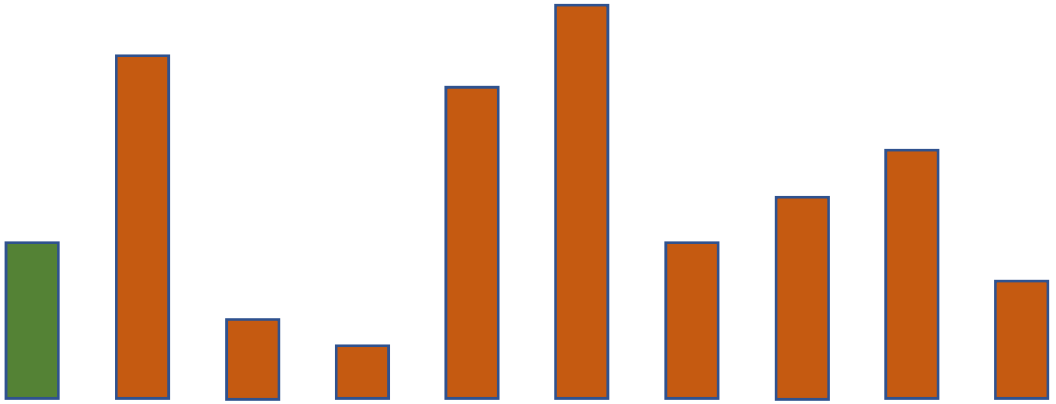
Implementazione semplice che usa le nostre **pairslist**:

```
def SelectionSort(As):
    def SortI(Ls):
        if IsEmpty(Ls):
            return Ls
        a = Min(Ls)
        return MakeList(a, SortI(RemoveFirst(Ls, a)))

    return SortI(As)
```

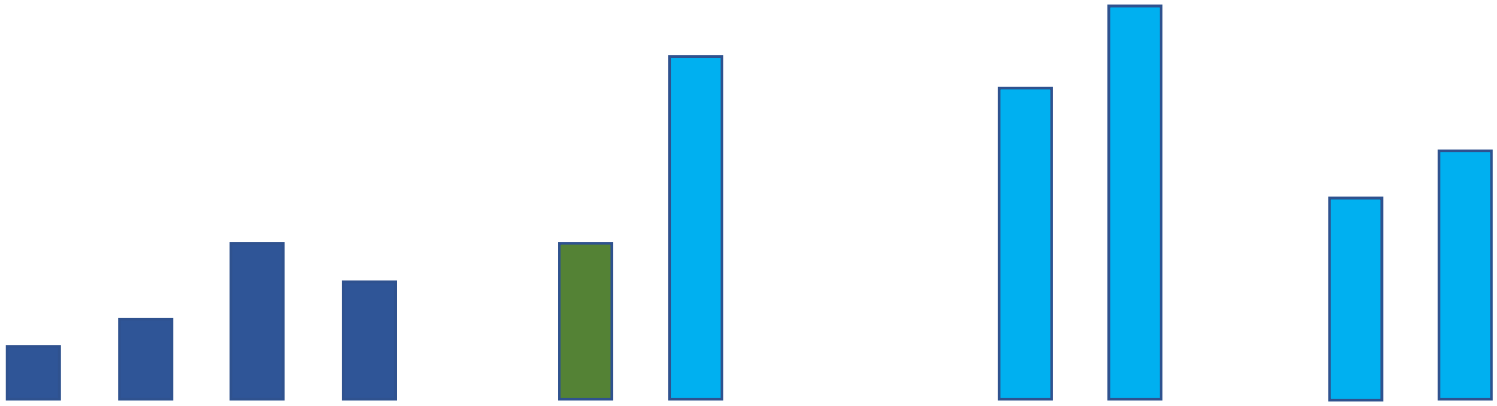
# Quick Sort

**1. Seleziona un pivot**

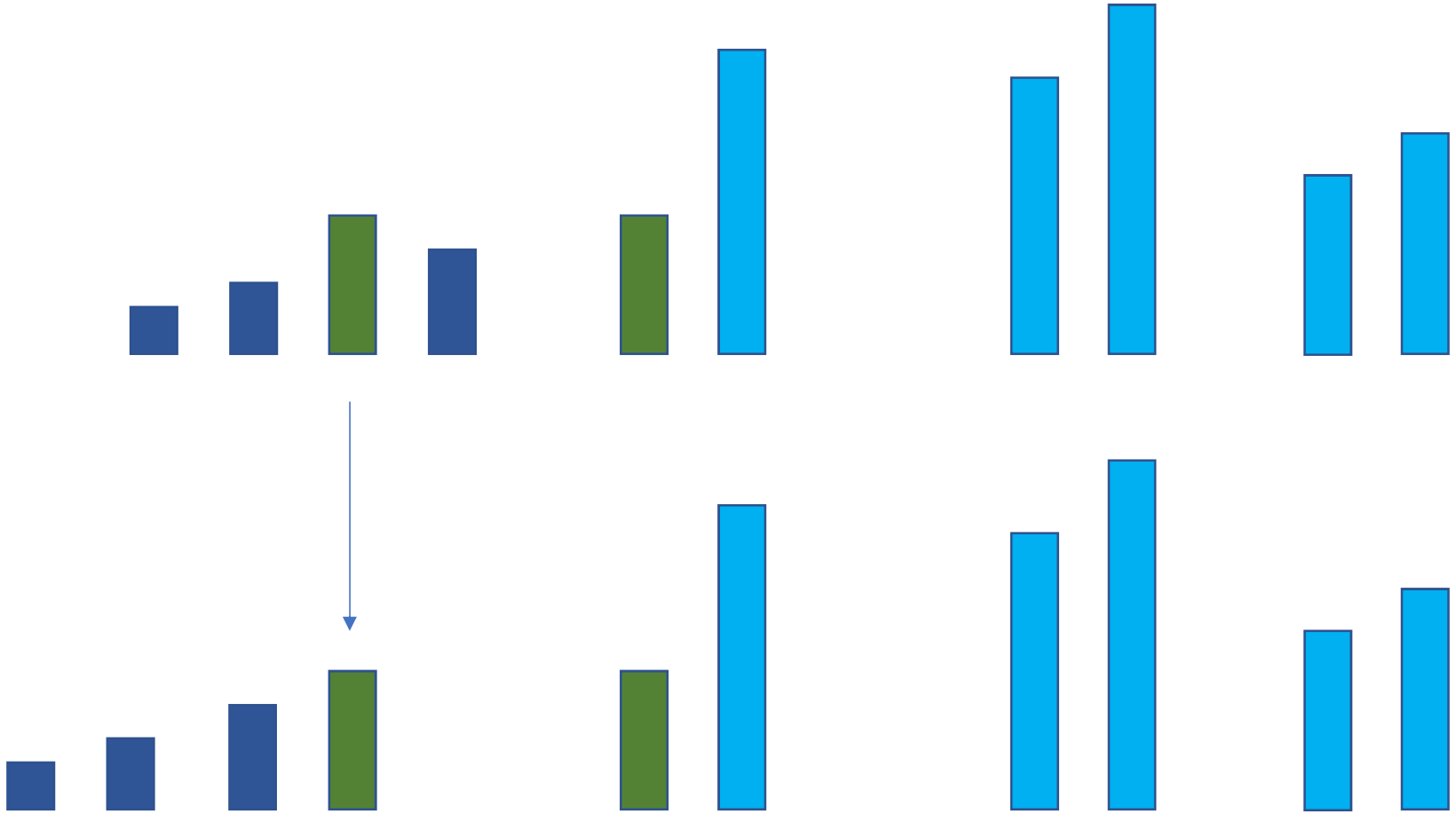


**2. Crea due liste con elementi minori e maggiori**

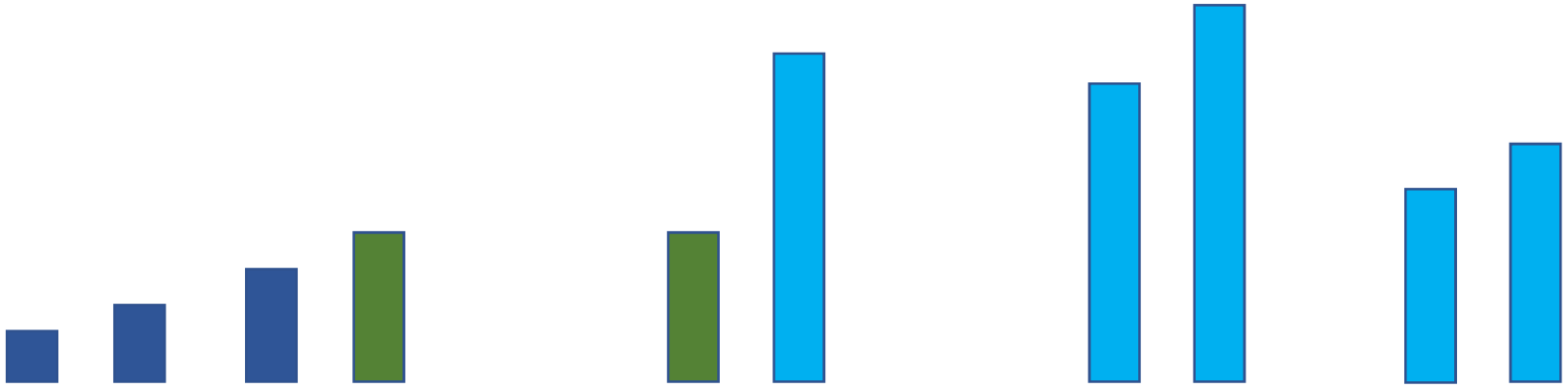
**3. Ripete per le due liste**



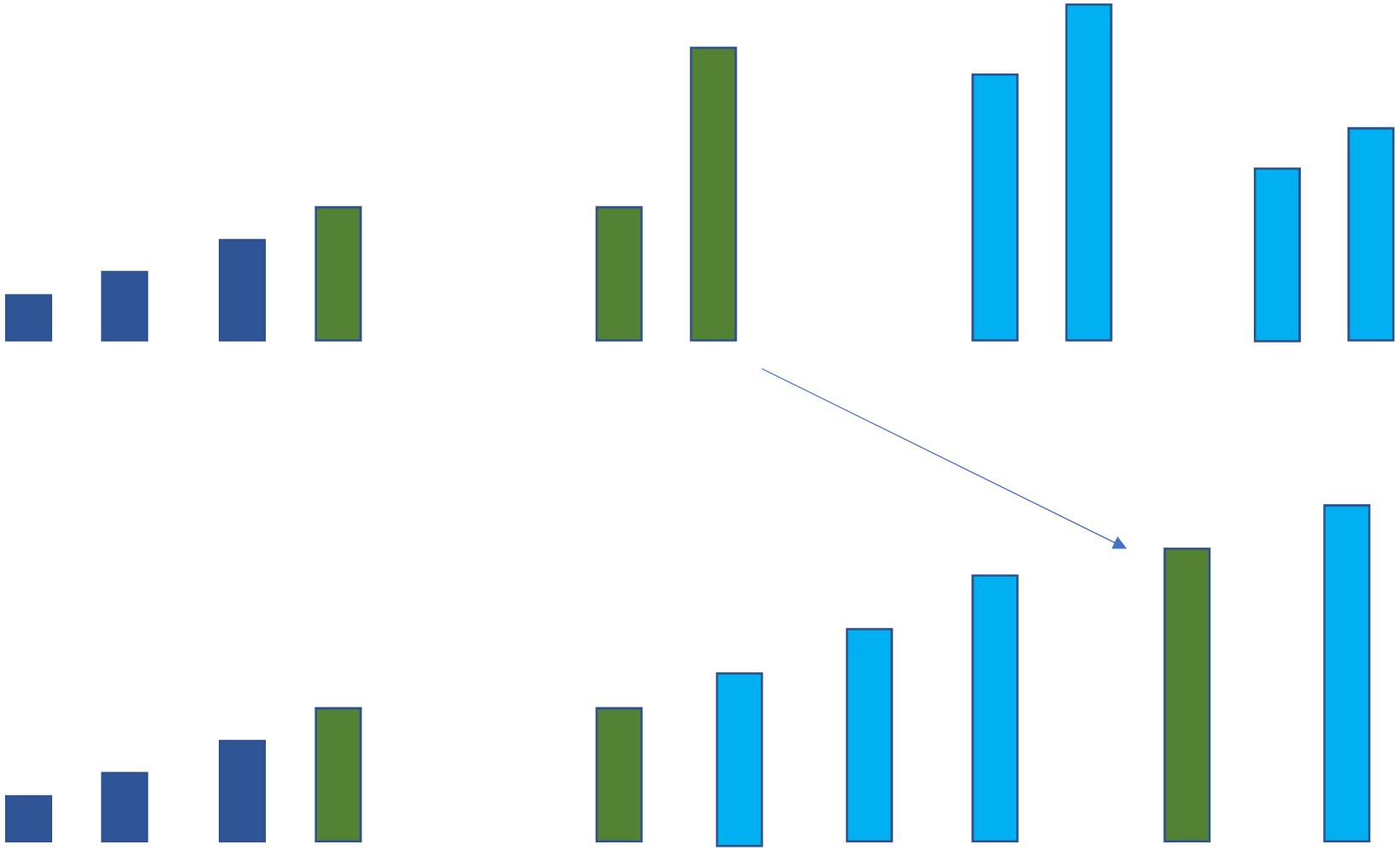
# Quick Sort



# Quick Sort

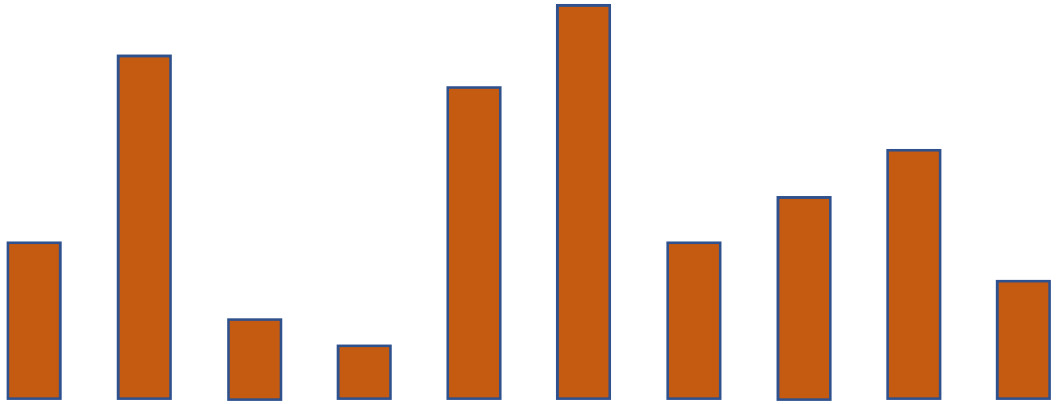


# Quick Sort

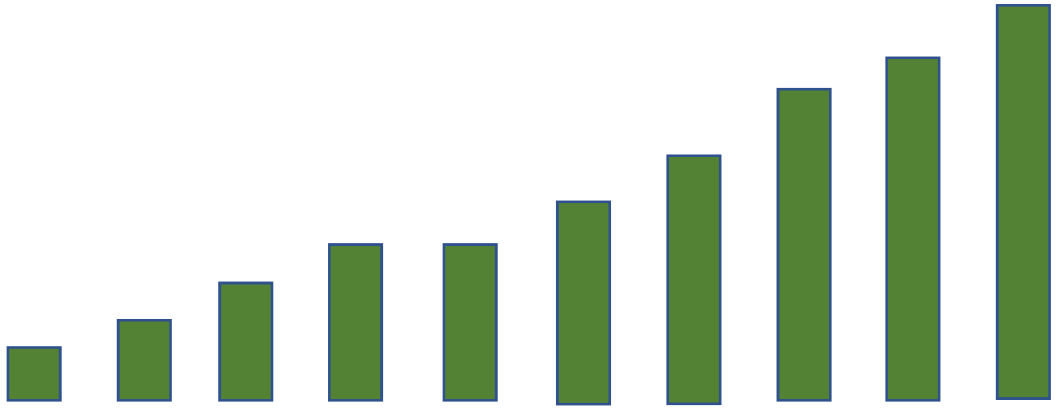


# Algoritmi di ordinamento

**INPUT**



**OUPUT**



# Algoritmi di ordinamento

Implementazione di quicksort che usa le nostre **pairslist**:

```
def QuickSort(As):
    if IsEmpty(As):
        return As
    x = Head(As)
    Ls = Filter(lambda z: z <= x, Tail(As))
    Gs = Filter(lambda z: z >  x, Tail(As))
    return Append(QuickSort(Ls),
                  Append(MakeList(x), QuickSort(Gs)))
```

# Algoritmi di ordinamento

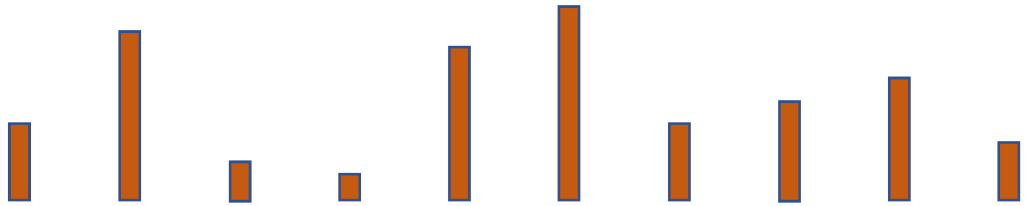
Implementazione di quicksort generica, che prende in input una funzione di confronto:

```
def QuickSort(As, Cmp=lambda x,y: x<=y):
    if IsEmpty(As):
        return As
    x = Head(As)
    Ls = Filter(lambda z: Cmp(z, x), Tail(As))
    Gs = Filter(lambda z: not Cmp(z, x), Tail(As))
    return Append(QuickSort(Ls, Cmp),
                  Append(MakeList(x), QuickSort(Gs, Cmp)))
```

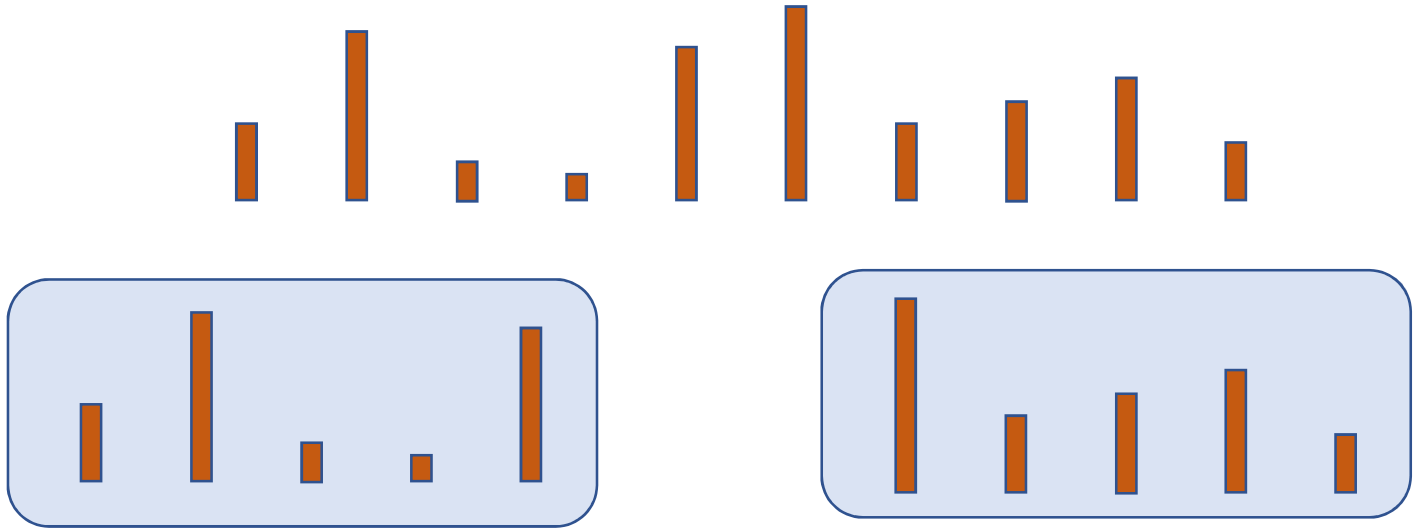
# John von Neumann

https://en.wikipedia.org/wiki/John_von_Neumann
https://en.wikipedia.org/wiki/Merge_sort

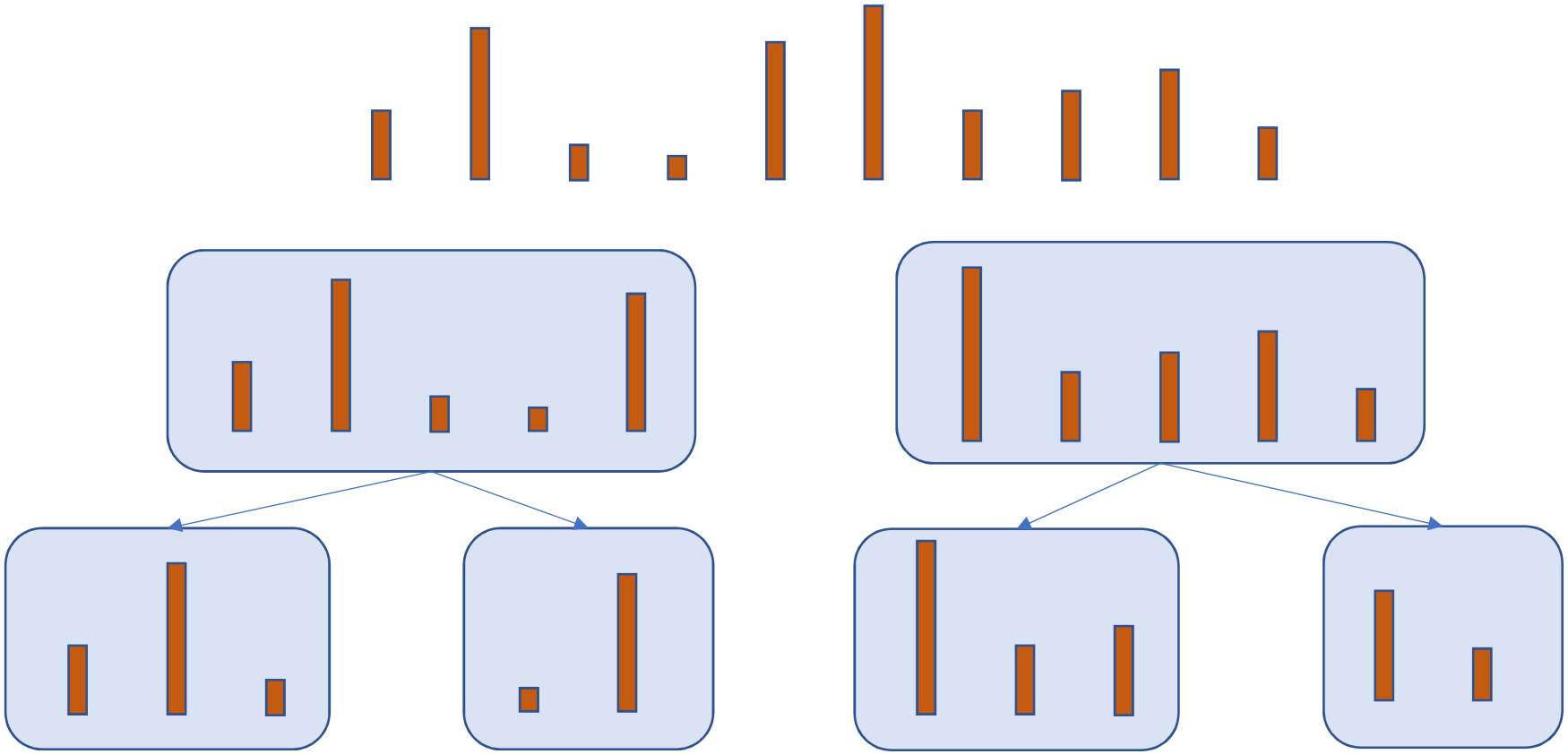
# Merge Sort



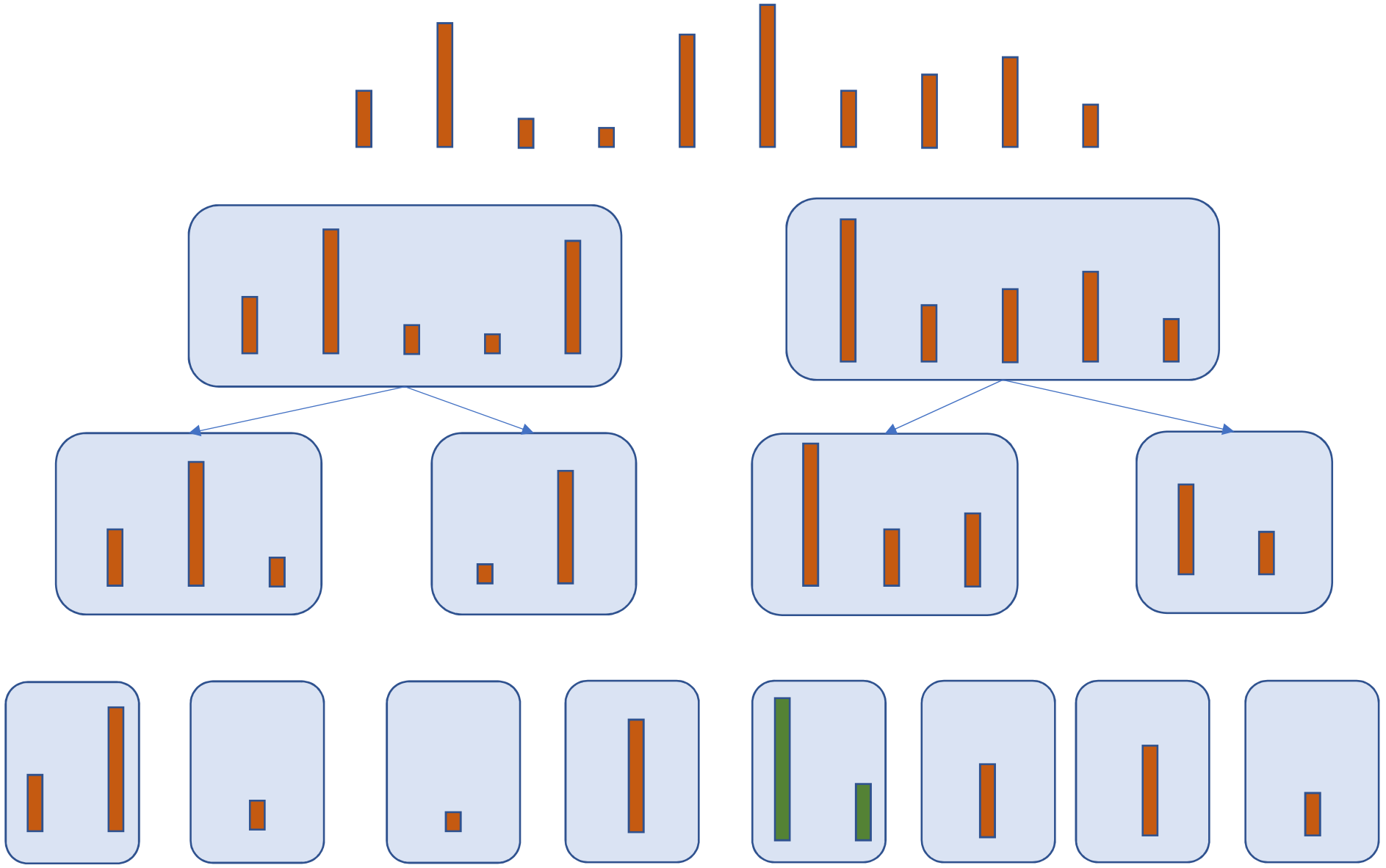
# Merge Sort



# Merge Sort



# Merge Sort



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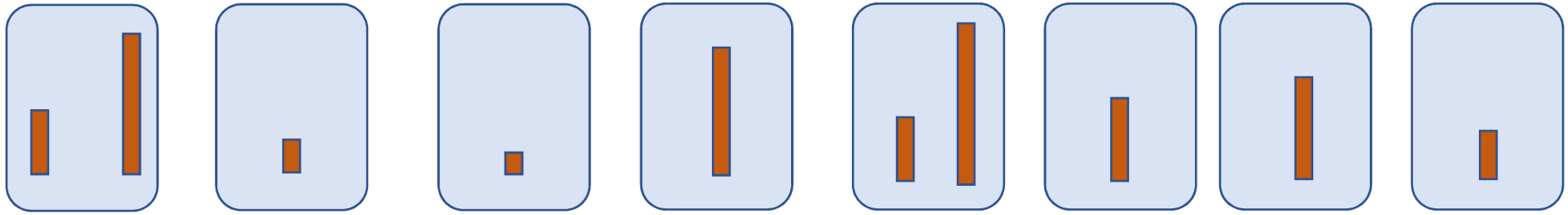
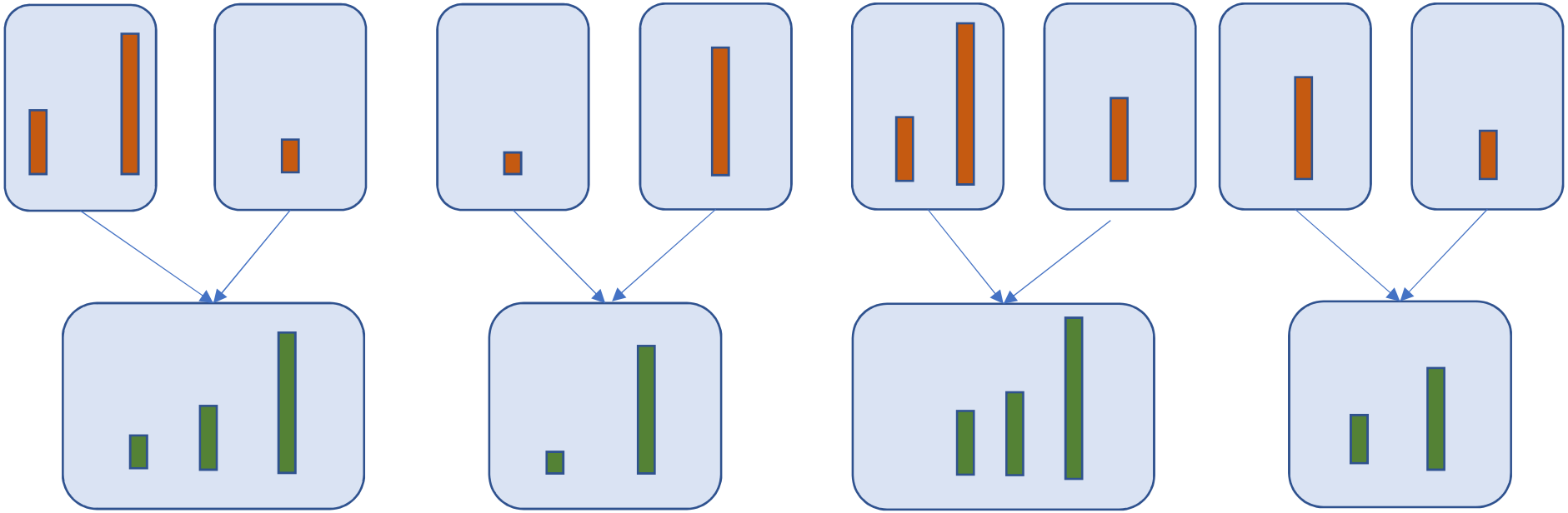
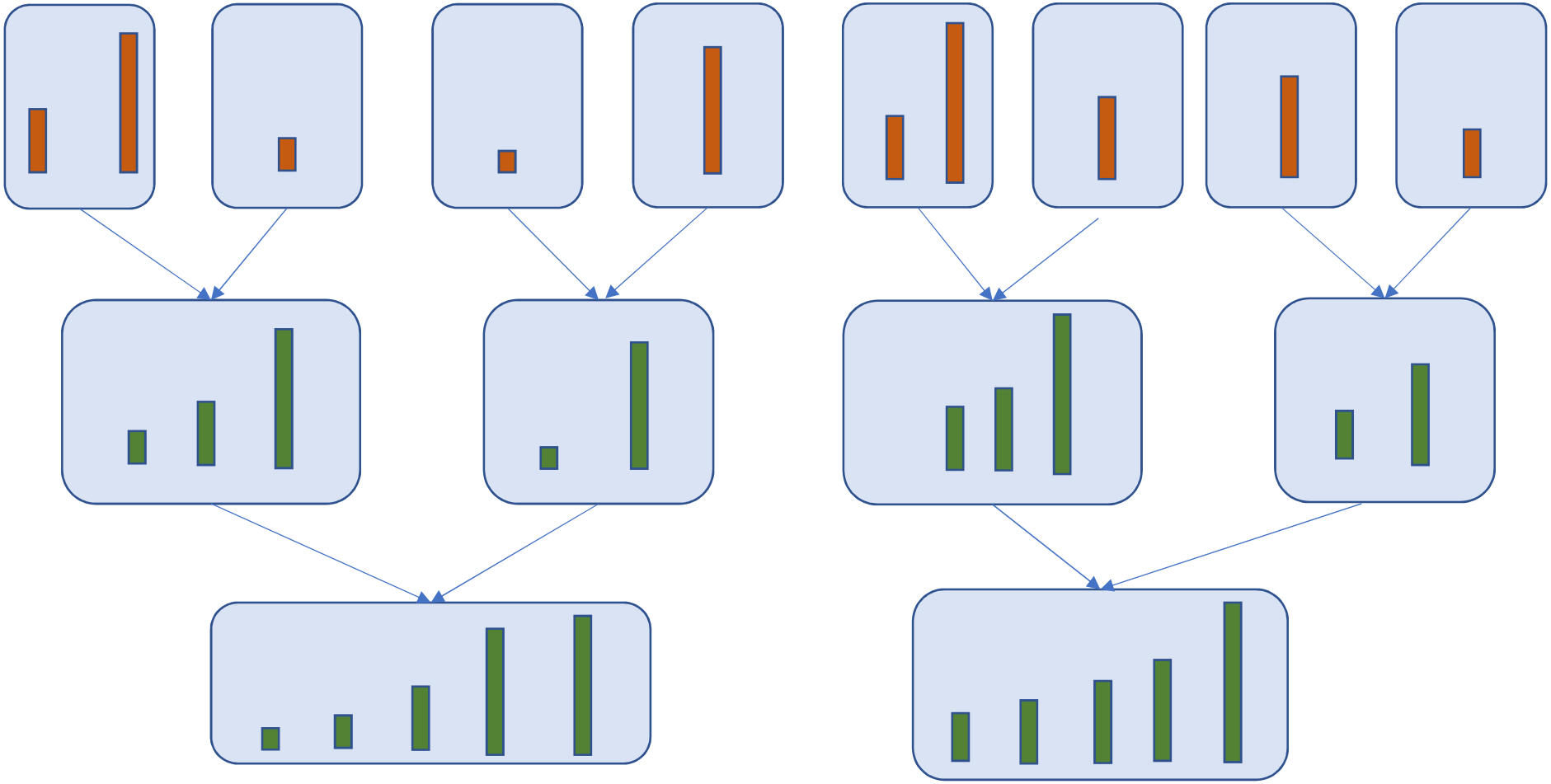


# Merge Sort



# Merge Sort



# Merge Sort