1 Pseudo-code

Algorithm 1: Selection Sort

Input: number *Array* length l

Output: array in ascending order

```
 1 for i ← 0 to l − 2 by 1 do
 2 │   minIndex ← i
 3 │   for j ← i + 1 to l − 1 by 1 do
 4 │   │   if Array[minIndex] > Array[j] then
 5 │   │   │   minIndex ← j
 6 │   │   end
 7 │   end
 8 │   if minIndex ≠ i then
 9 │   │   Swap(Array[i], Array[minIndex])
10 │   end
11 end
12 return Array
```

2 Analysis

$$
\begin{aligned}
\sum_{i=0}^{n-2}\sum_{j=i+1}^{n-1} 1 \; &= \; \sum_{i=0}^{n-2}(n-1)-(i+1)+1 \\
&= \; \sum_{i=0}^{n-1} n - 1 - i \\
&= \; \sum_{i=0}^{n-1} i \\
&= \; \frac{1}{2}n(n-1) \\
&= \; \Theta(n^2)
\end{aligned}
$$

3 Coding

3.1 ES6 展开赋值

4 Mathematics

$$
\begin{aligned}
\sum_{i=0}^{i=n-1} i &= 0 + 1 + 2 + \cdots + (n-1) \\
&= \frac{1}{2}(\sum_{i=0}^{i=n-1} i + \sum_{i=0}^{i=n-1} n-1-i) \\
&= \frac{1}{2}\sum_{i=0}^{i=n-1} n-1 \\
&= \frac{1}{2}n(n-1)
\end{aligned}
$$