

⑥

$$T(n) = (c_1 + c_2 + c_3 + c_4 + c_7)n - (c_2 + c_3 + c_4 + c_5 + c_7)$$

$$= an + b. \rightarrow \text{thus a linear function.} \rightarrow O(n).$$

can be written as.

for the worst case, we will have a reverse array.

that means (line 4) t_j will be called for all the elements in the sorted array on the left; so, \downarrow that is from $j=2 \dots n$.

$$T(j) = \sum_{j=2}^n j = \frac{n(n+1)}{2} - 1. \quad \sum_{j=2}^n j-1 = \frac{n(n-1)}{2}.$$

& substituting the $T(j)$

$$T(n) = c_1 + c_2(n-1) + c_3(n-1) + c_4\left(\frac{n(n-1)}{2} - 1\right) + c_5\left(\frac{n(n-1)}{2}\right) + c_6\left(\frac{n(n-1)}{2}\right) + c_7(n-1).$$

solving

$$= an^2 + b_1n + c \quad \text{so that it's quadratic,}$$

$$O(n^2)$$