SELECTION SORT

$$S(n) = \begin{cases} d, & n = \{0,1\} \\ S(n-1) + cn, & n > 1 \end{cases}$$

$i = 1$ $\quad S(n) = S(n-1) + cn$

$i = 2$ $\quad S(n) = (S(n-2) + c(n-1)) + cn$

$$S(n) = S(n-2) + 2cn - c$$

$i = 3$ $\quad S(n) = (S(n-3) + c(n-2)) + 2cn - c$

$$S(n) = S(n-3) + 3cn - (1+2)c$$

$i = k$ $\quad S(n) = S(n-k) + kcn - c \sum_{i=1}^{k-1} i$

$n = K$ $\quad S(n) = S(0) + cn^2 - c\frac{(n-1)n}{2}$

$$S(n) = d + cn^2 - \frac{cn^2}{2} - \frac{cn}{2}$$

$$S(n) = d + \frac{cn^2}{2} - \frac{cn}{2} \in O(n^2)$$