

Let $s(k, n)$ be the number of swaps done when `Perm` is invoked as `Perm(a, k, n)`. $s(k, n) = 0$ when $k = n$ and $(n - k + 1)(2 + s(k + 1, n))$ when $k < n$. Using repeated substitution, we get

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