Require: $(x_1, x_2, \ldots, x_n)$. Assumes $n \geq 4$.
Ensure: A permutation $(y_1, y_2, \ldots, y_n)$ of $(1, 2, \ldots, n)$, $x_{y_1} \leq x_{y_2} \leq \cdots \leq x_{y_n}$.
  for $i \leftarrow 1$ to n **do** $\{i \neq j \Rightarrow |y_i - y_j| > 2^{\lfloor n/2 \rfloor}\}$
    $y_i \leftarrow x_i 2^n + i 2^{\lfloor n/2 \rfloor}$
  end for
  $w \leftarrow \sum_{i=1}^{n} 2^{y_i}$ {binary representation of w has 1s in the y_jth position, and 0s otherwise}
  for $i \leftarrow 1$ to n **do** {binary representation of a_i has 1s in the y_jth position where $y_j \geq y_i$, and 0s otherwise}
    $a_i \leftarrow \lfloor w/2^{y_i} \rfloor 2^{y_i}$
  end for
  $b \leftarrow \sum_{i=1}^{n} a_i$ {binary representation of b has the property that position $y_j, \ldots, y_j + 2^{\lfloor n/2 \rfloor} - 1$ contain the binary representation of the rank of y_j in $\{y_1, \ldots, y_n\}$}
  for $i \leftarrow 1$ to n **do** $\{k_i$ denotes the rank of x_i in $\{x_1, \ldots, x_n\}\}$
    $c_i \leftarrow \lfloor b/2^{y_i} \rfloor$
    $d_i \leftarrow \lfloor c_i/2^{\lfloor n/2 \rfloor} \rfloor 2^{\lfloor n/2 \rfloor}$
    $k_i = \max\{0, c_i - d_i\}$
  end for