Algorithm 2.1 QUICKSORT

Input.   Sequence $(a_1, a_2, \ldots, a_n)$

Output. Sequence $(b_1, b_2, \ldots, b_n)$

(1) If $n = 0$ return.

(2) Otherwise let $p = a_1$. Let ℓ and r be two empty sequences.

(3) For $i = 2, \ldots, n$, if $a_i \leq p$ append a_i to ℓ otherwise append a_i to r.

(4) Return $(\text{QUICKSORT}(\ell), p, \text{QUICKSORT}(r))$

Algorithm 2.2 QUICKSELECT

Input.   Sequence $(a_1, a_2, \ldots, a_n)$, integer k

Output. Element b

(1) If $n = 0$ return.

(2) Otherwise let $p = a_1$. Let ℓ and r be two empty sequences.

(3) For $i = 2, \ldots, n$, if $a_i \leq p$ append a_i to ℓ otherwise append a_i to r.

(4) If $|\ell| = k - 1$ return $b = p$. Else, if $|\ell| > k$ return QUICKSELECT(ℓ, k), otherwise return QUICKSELECT$(r, k - |\ell|)$