RAND-SELECT($A[p..q]$, i)   ▷ ith smallest of $A[p \, . . \, q]$
    if $p = q$ **then return** $A[p]$
    $r \leftarrow$ RAND-PARTITION($A[p..q]$)
    $k \leftarrow r - p + 1$ ▷ $k = \text{rank}(A[r])$
    if $i = k$ **then return** $A[r]$
    if $i < k$
        then return RAND-SELECT($A[p..r{-}1]$, i)
        else return RAND-SELECT($A[r{+}1..q]$, $i - k$)