

Quick Sort Algorithm

QUICKSORT(A, p, r)

```
1  if  $p < r$ 
2      // Partition the subarray around the pivot, which ends up in  $A[q]$ .
3       $q = \text{PARTITION}(A, p, r)$ 
4      QUICKSORT( $A, p, q - 1$ ) // recursively sort the low side
5      QUICKSORT( $A, q + 1, r$ ) // recursively sort the high side
```

PARTITION(A, p, r)

```
1   $x = A[r]$  // the pivot
2   $i = p - 1$  // highest index into the low side
3  for  $j = p$  to  $r - 1$  // process each element other than the pivot
4      if  $A[j] \leq x$  // does this element belong on the low side?
5           $i = i + 1$  // index of a new slot in the low side
6          exchange  $A[i]$  with  $A[j]$  // put this element there
7  exchange  $A[i + 1]$  with  $A[r]$  // pivot goes just to the right of the low side
8  return  $i + 1$  // new index of the pivot
```