**Quick Sort Algorithms**

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| **quick\_sort(A,p,r)**  if p < r  q=partition(A,p,r(  quick\_sort(A,p,q-1(  quick\_sort(A,q+1,r( | **partition(A,p,r)**  pivot = A[r]  i = p-1  for j = p to r-1  if A[j] ≤ pivot  i= i+1  swap(A[i],A[j])  swap(A[i+1], A[r])  return i+1 |

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| **Quicksort(A,p,r)**    if p < r  then pivot ← Partition(A,p,r)  Quicksort(A,p,pivot)  Quicksort(A,pivot+1,r) | **Partition(A,p,r)**    x←A[p]    i←p-1    j←r+1    while TRUE    repeat j ← j-1    until A[ j ] < x    repeat i ← i+1    until A[ i ] > x    if i<j    then exchange A[ i ]↔A[ j ]    else return j |