Lab 06: Implementation of Quick Sort

**Quick Sort**

Quicksort is a divide and conquer algorithm. Quicksort first divides a large list into two smaller sub-lists: the low elements and the high elements. Quicksort can then recursively sort the sub-lists.

The steps are:

**Step 1:** Find the pivot index (the partition into two subarray)

**Step 2:** Sort the left subarray

**Step 3:** Sort the right subarray

pivot

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 2 | 1 | 6 | 8 | 5 | 3 | 4 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 1 | 3 | 4 | 8 | 5 | 7 | 6 |

pivot

|  |  |  |  |
| --- | --- | --- | --- |
| 8 | 5 | 7 | 6 |

|  |  |  |
| --- | --- | --- |
| 2 | 1 | 3 |

|  |
| --- |
| 3 |

|  |  |
| --- | --- |
| 2 | 1 |

|  |  |
| --- | --- |
| 8 | 5 |

|  |  |
| --- | --- |
| 7 | 6 |

|  |
| --- |
| 1 |

|  |
| --- |
| 2 |

|  |
| --- |
| **Algorithm: QuickSort (Data, Start, End):**  Step 1 If (Start < End)  Step 2:Set PINDEX = Call Partition (Data, Start, End)  Step 3CallQuickSort (Data, Start, PINDEX-1)  Step 4CallQuickSort (Data, PINDEX + 1, End) |

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| **Algorithm: Partition(Data, Start, End) :**  Step 1 Set PIVOT:= Data[End]  Step 2 Set PINDEX = Start  Step 3 Repeat For (Start to End -1)  Step 4 If (Data[i] <= PIVOT  Step 5 Swap (Data[i], Data[PINDEX])  Step 6 PINDEX: = PINDEX +1  Step 7 End if  Step 8 End for  Step 9 Swap (Data[PINDEX], Data[End])  Step 10 Return PINDEX |