# QuickSort By Hand

Starting with the array pictured below, fill out the variables below it, step by step, in order to show how a QuickSort operates. Make sure to fill in the blanks for the starting & ending spot of the subset of the array that's currently being considered, and for the pivot value. Redraw the array any time that two elements are swapped.

The first couple of steps are filled in, as a demonstration

Given the method (defined with the SearchingAndSorting class)

**bool QuickSort(int[] nums)**

This method will be called from main, in the following manner:

int [] nums = { 4, -30, 5, 17, 12, 7, 3, -10};

SearchingAndSorting sas = new SearchingAndSorting();

sas.QuickSort( nums) )

You will start your 'trace' as follows:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | 4 | -30 | 5 | 17 | 12 | 7 | 3 | -10 |

Subset being considered:

Smallest Index: \_\_\_**0**\_\_\_\_\_ Largest Index:\_\_\_\_\_ **7**\_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_ **4**\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | **4** | **-30** | **-10** | **17** | **12** | **7** | **3** | **5** |

Subset being considered:

Smallest Index: \_\_\_**0**\_\_\_\_\_ Largest Index:\_\_\_\_\_ **7**\_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_ **4**\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | **4** | **-30** | **-10** | 3 | **12** | **7** | 17 | 5 |

Subset being considered:

Smallest Index: \_\_\_\_\_\_\_\_ Largest Index:\_\_\_\_\_ \_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | 3 | **-30** | **-10** | 4 | **12** | **7** | 17 | 5 |

Subset being considered:

Smallest Index: \_\_\_0\_\_\_\_\_ Largest Index:\_\_\_\_\_2 \_\_\_\_ Pivot Value:\_\_\_\_\_\_3\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | 3 | **-30** | **-10** | 4 | **12** | **7** | 17 | 5 |

Subset being considered:

Smallest Index: \_\_\_\_\_\_\_\_ Largest Index:\_\_\_\_\_ \_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -10 | -30 | 3 | 4 | **12** | **7** | 17 | 5 |

Subset being considered:

Smallest Index: \_\_\_\_0\_\_\_\_ Largest Index:\_\_\_\_1\_ \_\_\_\_ Pivot Value:\_\_\_\_-10\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -30 | -10 | 3 | 4 | **12** | **7** | 17 | 5 |

Subset being considered:

Smallest Index: \_\_\_\_\_4\_\_\_ Largest Index:\_\_\_\_\_7 \_\_\_\_ Pivot Value:\_\_\_\_\_\_12\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -30 | -10 | 3 | 4 | **12** | **7** | 5 | 17 |

Subset being considered:

Smallest Index: \_\_\_\_\_\_\_\_ Largest Index:\_\_\_\_\_ \_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -30 | -10 | 3 | 4 | 5 | **7** | 12 | 17 |

Subset being considered:

Smallest Index: \_\_\_\_\_\_\_\_ Largest Index:\_\_\_\_\_ \_\_\_\_ Pivot Value:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -30 | -10 | 3 | 4 | 5 | **7** | 12 | 17 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Array Index: | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Value: | -30 | -10 | 3 | 4 | 5 | **7** | 12 | 17 |

***Please continue on a separate sheet of paper, if you need more space***