Feedback — Quicksort

You submitted this quiz on **Sun 21 Feb 2016 12:06 PM PST**. You got a score of **3.00** out of **3.00**.

To specify an array or sequence of values in an answer, separate the values in the sequence by whitespace. For example, if the question asks for the first ten powers of two (starting at 1), then the following answer is acceptable:

```
1 2 4 8 16 32 64 128 256 512
```

If you wish to discuss a particular question and answer in the forums, please post the entire question and answer, including the seed (which can be used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

Question 1

(seed = 169085)
Give the array that results after applying the standard 2-way partitioning subroutine from lecture to the following array:

```
52 67 40 57 99 98 10 59 62 92 85 37
```

Your answer should be a sequence of 12 integers, separated by whitespace.

Recall, in the standard 2-way partitioning subroutine, the leftmost entry is the partitioning item.

You entered:

10 37 40 52 99 98 57 59 62 92 85 67

Your Answer		Score	Explanation
10 37 40 52 99 98 57 59 62 92 85 67	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

The correct answer is: 10 37 40 52 99 98 57 59 62 92 85 67

Here is the array before and after each exchange:

i	j	0	1	2	3	4	5	6	7	8	9	10	11
0	12	52	67	40	57	99	98	10	59	62	92	85	37
1	11	52	67	40	57	99	98	10	59	62	92	85	37
1	11	52	37	40	57	99	98	10	59	62	92	85	67
3	6	52	37	40	57	99	98	10	59	62	92	85	67
3	6	52	37	40	10	99	98	57	59	62	92	85	67
4	3	10	37	40	52	99	98	57	59	62	92	85	67
	3	10	37	40	52	99	98	57	59	62	92	85	67

Question 2

(seed = 783134)
Give the array that results after applying the standard 2-way partitioning subroutine from lecture to the following array:

B B B A A A A A B A B A

Your answer should be a sequence of 12 letters, separated by whitespace.

Recall, in the standard partitioning subroutine, the leftmost entry is the partitioning item and the scan stops on either side upon a key equal to the key in the partitioning item.

You entered:

A A B A A A A A B B B B

Your Answer		Score	Explanation
A A B A A A A A B B B B	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

The correct answer is: A A B A A A A A B B B B

Here is the array before and after each exchange:

i	j	0	1	2	3	4	5	6	7	8	9	10	11
0	12	B	B	B	A	A	A	A	A	B	A	B	A
1	11	B	B	B	A	A	A	A	A	B	A	B	A
1	11	B	A	B	A	A	A	A	A	B	A	B	B
2	10	B	A	B	A	A	A	A	A	B	A	B	B
2	10	B	A	B	A	A	A	A	A	B	A	B	B
8	9	B	A	B	A	A	A	A	A	B	A	B	B
8	9	B	A	B	A	A	A	A	A	A	B	B	B
9	8	B	A	B	A	A	A	A	A	A	B	B	B
	8	A	A	B	A	A	A	A	A	B	B	B	B

Question 3

(seed = 524655)
Which of the following statements about quicksort are true? Check all that apply. Unless otherwise specified, assume that quicksort refers to the recursive, randomized version of quicksort (with no extra optimizations) and uses the 2-way partitioning algorithm described in lecture.

Your Answer		Score	Explanation
☑ The maximum number of recursive function calls to sort() when quicksorting an array of N distinct items is no more than 2N.	✔	0.20	Two recursive calls to sort() are made only after a partitioning step, which fixes the repartitioning item item into position.
☐ The number of compares to quicksort an array of N equal keys is ~ N.	✔	0.20	The number of compares is ~ N lg N. The 2-way partitioning algorithm stops the scan on equal keys, so each passioning step divides the array in half.
☐ If the input array has exactly one pair of item's with equal keys, then quicksort (without the random shuffle) is a stable sorting algorithm.	✔	0.20	Quicksorting the array { (B, 1), (C, 1), (C, 2), (A, 1) } results in the sorted array { (A, 1), (B, 1), (C, 2), (C, 1) }.
☑ Any two items that are compared with one another during one quicksort partitioning step cannot be compared with one another during a subsequent partitioning step.	✔	0.20	Every compare involves a partitioning item. Once the partitioning step ends, that partitioning item is fixed into its final position and is never involved in a compare again.
☐ The number of partitioning steps to quicksort an array of N items is no larger than the number of distinct keys.	✔	0.20	There will be many more than one partition step to sort an array containing N equal keys.
Total		1.00 / 1.00	