Feedback — Quicksort

Help Center

You submitted this quiz on **Mon 21 Sep 2015 7:38 PM EDT**. You got a score of **1.40** out of **3.00**. You can attempt again, if you'd like.

```
To specify an array or sequence of values in an answer, separate the value
s in
the sequence by whitespace. For example, if the question asks for the firs
t
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, ple
ase
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 (w
hich
contains the correct answer).
```

Question 1

```
(seed = 223221)
Give the array that results after applying the standard 2-way partitioning
subroutine from lecture to the following array:

    72 41 75 31 93 19 68 11 82 51 35 18

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

Recall, in the standard 2-way partitioning subroutine, the leftmost entry i
s the partitioning item.
```

You entered:

```
51  41  18  31  35  19  68  11  72  82  93  75
```

Your Answer		Score	Explanation
51 41 18 31 35 19 68 11 72 82 93 75	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 51 41 18 31 35 19 68 11 72 82 93 75

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   72  41  75  31  93  19  68  11  82  51  35  18
  2  11   72  41  75  31  93  19  68  11  82  51  35  18
  2  11   72  41  18  31  93  19  68  11  82  51  35  75
  4  10   72  41  18  31  93  19  68  11  82  51  35  75
  4  10   72  41  18  31  35  19  68  11  82  51  93  75
  8   9   72  41  18  31  35  19  68  11  82  51  93  75
  8   9   72  41  18  31  35  19  68  11  51  82  93  75
  9   8   51  41  18  31  35  19  68  11  72  82  93  75
      8   51  41  18  31  35  19  68  11  72  82  93  75
```

Question 2

```
(seed = 863998)
Give the array that results after applying the standard 2-way partitioning
subroutine from lecture to the following array:

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

Your answer should be a sequence of 12 integers, 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 p
artitioning item.

You entered:

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

Your Answer		Score	Explanation
A A A A A A A A B B B B	✖	0.00	
Total		0.00 / 1.00	

Question Explanation

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

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	A	A	B	A	B	A	A	A	A	B	B	A
1	11	A	A	B	A	B	A	A	A	A	B	B	A
1	11	A	A	B	A	B	A	A	A	A	B	B	A
2	8	A	A	B	A	B	A	A	A	A	B	B	A
2	8	A	A	A	A	B	A	A	A	B	B	B	A
3	7	A	A	A	A	B	A	A	A	B	B	B	A
3	7	A	A	A	A	B	A	A	A	B	B	B	A
4	6	A	A	A	A	B	A	A	A	B	B	B	A
4	6	A	A	A	A	A	A	B	A	B	B	B	A
5	5	A	A	A	A	A	A	B	A	B	B	B	A
	5	A	A	A	A	A	A	B	A	B	B	B	A

Question 3

(seed = 826627)
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
☑ There exists a linear-time compare-based deterministic algorithm to find a median of an array of N items.	✔	0.20	The lecture slides refer to the first such algorithm, discovered by Blum, Floyd, Pratt, Rivest, and Tarjan. Unfortunately, no known deterministic algorithms for the problem are currently practical.
☑ The expected number of compares to quicksort an array of N keys can be substantially more (e.g., a constant factor) than ~ 2 N ln N if there are a large number of items with equal keys.	✖	0.00	The expected number of compares only decreases from ~ 2 N ln N in the presence of equal keys.
☐ The expected number of compares to find a median of an array of N items using quickselect is linearithmic.	✔	0.20	It is linear.
☐ When partitioning an array of N distinct keys, the partitioning item may be compared to itself.	✖	0.00	This happens if the key in the partitioning item is the smallest key in the array.

☑ `Guaranteed performance is one reason why the Java system sort uses a deterministic version of quicksort instead of a randomized one.`	✖	0.00	The deterministic version of quicksort used by the Java system sort has a family of inputs for which the running time is quadratic.
Total		0.40 / 1.00	

Question Explanation