Feedback — Priority Queues

Help Center

You submitted this quiz on **Sun 27 Sep 2015 1:59 PM EDT**. You got a score of **2.80** 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 acceptabl
e:

     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 = 467705)
Give the sequence of the keys in the array that results after
inserting the sequence of 3 keys

    95 57 80

into the following maximum-oriented binary heap of size 10:

    81 77 75 43 36 30 67 19 24 15

Your answer should be a sequence of 13 integers, separated by whitespace.
```

You entered:

```
95  81  80  43  77  75  67  19  24  15  36  30  57
```

Your Answer		Score	Explanation
95 81 80 43 77 75 67 19 24 15 36 30 57	✓	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 95 81 80 43 77 75 67 19 24 15 36 30 57

Here is the sequence of keys in the array after each insertion:

    81 77 75 43 36 30 67 19 24 15
95: 95 81 75 43 77 30 67 19 24 15 36
57: 95 81 75 43 77 57 67 19 24 15 36 30
80: 95 81 80 43 77 75 67 19 24 15 36 30 57
```

Question 2

```
(seed = 767245)
Give the sequence of keys in the array that results after performing 3
successive delete-the-max operations on the following maximum-oriented bina
ry heap
of size 10:

    85 83 70 46 54 26 19 11 34 33

Your answer should be a sequence of 7 integers, separated by whitespace.
```

You entered:

```
54  46  34  11  33  26  19
```

Your Answer	Score	Explanation

54 46 34 11 33 26 19	✓	1.00
Total		1.00 / 1.00

Question Explanation

```
The correct answer is: 54 46 34 11 33 26 19

Here is the sequence of keys in the array after each deletion:

                85 83 70 46 54 26 19 11 34 33
[ 85 deleted ]  83 54 70 46 33 26 19 11 34
[ 83 deleted ]  70 54 34 46 33 26 19 11
[ 70 deleted ]  54 46 34 11 33 26 19
```

Question 3

```
(seed = 813697)
Which of the following statements about priority queues are true? Check all that apply. Unless otherwise specified, assume that the binary heap implementation is the one from lecture (e.g., max-oriented and using 1-based indexing).
```

Your Answer		Score	Explanation
☑ `Let a[] be a binary heap that contains the N distinct integers 1, 2, ..., N. Then, key N must be in a[1] and N-2 must be in either a[2], a[3], a[4], a[5], a[6], or a[7].`	✓	0.20	Key N must be in root (a[1]). Key N-1 must be in either the left or right child of the root (a[2] or a[3]). Key N-2 must be in either a child of the root (a[2] or a[3]) or a child of key N-1 (a[4], a[5], a[6], or a[7]).
☑ `Unlike either mergesort or quickso`	✓	0.20	Mergesort is not in-place; quicksort has only a probabilistic linearithmic guarantee.

rt, heapsort is an in-place sorting algorithm that has linearithmic worst-case performance.			
□ It is possible to implement our priority queue API so that both insert() and delMax() take ~ lg (lg N) compares per operation (in the worst case), where N is the number of keys in the data structure.	✓	0.20	This would violate the ~ N lg N sorting lower bound since it would yield a ~ 2 N lg (lg N) compare-based sorting algorithm.
☑ Given an array of N comparable keys, it is possible to construct a binary heap containing those N keys using at most ~ 2 N compares.	✓	0.20	Bottom-up heap construction achieves this bound.
□ Given a sorted array of N comparable keys, it is possible to build a binary heap containing those N keys using no more than ~ 1/2 N compares.	✗	0.00	It can be done with 0 compares - a reverse-sorted array is a heap.
Total		0.80 / 1.00	

Question Explanation