Feedback — Elementary Sorts

You submitted this quiz on **Sun 13 Sep 2015 12:13 PM EDT**. You got a score of **1.80** 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 = 794427)
Give the array that results after the first 6 exchanges (not iterations!)
when insertion sorting the following array:

    24 25 70 90 94 31 83 40 63 86

Your answer should be a sequence of 10 integers, separated by whitespace.
```

You entered:

24 25 31 70 83 90 40 94 63 86

Your Answer	Score	Explanation
24 25 31 70 83 90 40 94 63 86	✔ 1.00	
Total	1.00 / 1.00	

Question Explanation

```
The correct answer is: 24 25 31 70 83 90 40 94 63 86

Here is the array after each exchange:

   24 25 70 90 94 31 83 40 63 86
1: 24 25 70 90 31 94 83 40 63 86
2: 24 25 70 31 90 94 83 40 63 86
3: 24 25 31 70 90 94 83 40 63 86
4: 24 25 31 70 90 83 94 40 63 86
5: 24 25 31 70 83 90 94 40 63 86
6: 24 25 31 70 83 90 40 94 63 86
```

Question 2

```
(seed = 717719)
Give the array that results immediately after the 4-sorting phase
(not necessarily after 4 exchanges) of Shellsort using Knuth's 3x+1 increme
nts
(...-121-40-13-4-1) on the following array:

   90 88 77 18 98 93 72 26 41 58

Your answer should be a sequence of 10 integers, separated by whitespace.
```

You entered:

41 48 72 18 90 88 77 26 98 93

Your Answer	Score	Explanation

41 48 72 18 90 88 77 26 98 93   ✘   0.00

Total   0.00 / 1.00

Question Explanation

```
The correct answer is: 41 58 72 18 90 88 77 26 98 93

Here is the array after each exchange in the 4-sorting phase:

   90 88 77 18 98 93 72 26 41 58
1: 90 88 72 18 98 93 77 26 41 58
2: 90 88 72 18 41 93 77 26 98 58
3: 41 88 72 18 90 93 77 26 98 58
4: 41 88 72 18 90 58 77 26 98 93
5: 41 58 72 18 90 88 77 26 98 93
```

Question 3

```
(seed = 997377)
Which of the following statements about elementary sorting algorithms are t
rue? Check all that apply. Unless otherwise specified, assume that the sort
ing implementations are the ones from the lectures.
```

Your Answer	Score	Explanation
☐ The number of compares to insertion sort a reverse-sorted array of N distinct keys is ~ 1/4 N^2.	✔ 0.20	It uses N(N-1)/2 compares.
☑ The expected number of exchanges to insertion sort a uniformly random array of N distinct	✔ 0.20	This property was established in lecture.

keys is ~ 1/4 N^2.

☐ The number of comp ares to selection sort a reverse-sor ted array of N dis tinct keys is ~ 1/2 N^2.	✖	0.00	Selection sort uses N(N-1)/2 compares to sort any array of N keys.
☑ Immediately after the 4-sorting pass in Shellsort (with Knuth's 3x+1 incre ments), the array is 4-sorted, 13-so rted, and 40-sorte d.	✔	0.20	During Shellsort, a g-sorted array remains g-sorted after h-sorting it.
☑ Each exchange in i nsertion sort decr eases the number o f inversions by ex actly one.	✔	0.20	Insertion sort exchanges only items of the form a[i] and a[i+1], with a[i] > a[i+1]. Exchanging two adjacent items that are inverted decreases the number of inversions by exactly one.
Total		0.80 / 1.00	

Question Explanation