Feedback — Elementary Sorts

Help Center

You submitted this quiz on **Sun 13 Sep 2015 11:38 AM EDT**. You got a score of **2.02** 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 = 611984)
Give the array that results after the first 6 exchanges (not iterations!)
when insertion sorting the following array:

    29 31 48 57 98 15 73 10 30 35

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

You entered:

15 29 31 48 57 73 98 10 30 35

Your Answer		Score	Explanation
15 29 31 48 57 73 98 10 30 35	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 15 29 31 48 57 73 98 10 30 35

Here is the array after each exchange:

   29 31 48 57 98 15 73 10 30 35
1: 29 31 48 57 15 98 73 10 30 35
2: 29 31 48 15 57 98 73 10 30 35
3: 29 31 15 48 57 98 73 10 30 35
4: 29 15 31 48 57 98 73 10 30 35
5: 15 29 31 48 57 98 73 10 30 35
6: 15 29 31 48 57 73 98 10 30 35
```

Question 2

```
(seed = 175515)
The column on the left contains an input array of 16 strings to be sorted;
the column
on the right contains the strings in sorted order; each of the other 6 colu
mns contains
the array at some intermediate step during either insertion sort, selection
sort, or shellsort
(with different columns potentially corresponding to different algorithms).

    CAKE   BLUR   CAKE   BLUR   CAKE   CAKE   CAKE   BLUR
    SADE   CAKE   SADE   CAKE   LIVE   JAYZ   LARD   CAKE
    NOFX   CARS   CARS   CARS   BLUR   LARD   LIVE   CARS
    RATT   EVE6   RATT   EVE6   EVE6   LIVE   MOBY   EVE6
    LARD   LARD   LARD   JAYZ   JAYZ   MOBY   NOFX   JAYZ
    LIVE   LIVE   LIVE   LARD   PINK   NOFX   RATT   LARD
    VAIN   VAIN   VAIN   LIVE   CARS   RATT   SADE   LIVE
    MOBY   MOBY   MOBY   MOBY   MOBY   SADE   VAIN   MOBY
    JAYZ   JAYZ   JAYZ   VAIN   LARD   VAIN   JAYZ   MUSE
```

```
PINK   PINK   PINK   PINK   SADE   PINK   PINK   NOFX
BLUR   SADE   BLUR   SADE   VAIN   BLUR   BLUR   PINK
EVE6   RATT   EVE6   RATT   NOFX   EVE6   EVE6   RATT
MUSE   MUSE   MUSE   MUSE   MUSE   MUSE   MUSE   SADE
TUFF   TUFF   TUFF   TUFF   TUFF   TUFF   TUFF   TUFF
WEEN   WEEN   WEEN   WEEN   WEEN   WEEN   WEEN   VAIN
CARS   NOFX   NOFX   NOFX   RATT   CARS   CARS   WEEN
----   ----   ----   ----   ----   ----   ----   ----
 0      ?      ?      ?      ?      ?      ?      4
```

Match up each column with the corresponding sorting algorithm from the given list:

0. Original input
1. Insertion sort
2. Selection sort
3. Shellsort (3x + 1 increments)
4. Sorted

You should use each choice at least once. Your answer should be a sequence of 8 integers
between 0 and 4 (starting with 0 and ending with 4), separated by whitespace.

Hint: think about algorithm invariants. Do not trace code.

You entered:

0 2 3 2 1 3 3 4

Your Answer		Score	Explanation
0	✔	0.12	
2	✔	0.12	
3	✔	0.12	
2	✔	0.12	
1	✖	0.00	
3	✖	0.00	

3	✖	0.00
4	✔	0.12
Total		0.62 / 1.00

Question Explanation

```
The correct answer is: 0 2 3 2 3 1 1 4

 0: Original input
 2: Selection sort after 4 iterations
 3: Shellsort after 13-sorting
 2: Selection sort after 8 iterations
 3: Shellsort after 4-sorting
 1: Insertion sort after 9 iterations
 1: Insertion sort after 8 iterations
 4: Sorted
```

Question 3

```
(seed = 698732)
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 exchanges to insertion sort an array of N distinct keys is equal to the number of inversions in the array.`	✖	0.00	This property explains insertion's sort linear-time performance on partially-ordered arrays.
☑ `If two items a a`	✖	0.00	Consider an array with three items { (B, 1), (B, 2), (A, 1) }, where the key is the letter A or B. After selection sort, the

nd b have equal keys and a appears before b in the input array, then a appears before b in the array after selection sorting the array.			array is { (A, 1), (B, 2), (B, 1) }. This property is known as stability. Stay tuned for the mergesort lecture.
☑ If an array is both 3-sorted and 5-sorted, then it is also 6-, 7-, 8-, 9-, and 10-sorted.	✖	0.00	The array is guaranteed to also be 6-, 8-, 9-, and 10-sorted but not necessarily 7-sorted.
☐ In the worst case, the order of growth of the number of compares to Shellsort (with Knuth's 3x+1 increments) an array of N distinct keys is N^(4/3).	✔	0.20	As asserted in lecture, the worst case order of growth is N^(3/2).
☑ The number of compares to insertion sort an array of N/2 0s followed by N/2 1s (e.g., 0 0 0 0 0 1 1 1 1 1) is ~ N.	✔	0.20	The number of inversions is 0. Thus, the number of compares is ~ N.
Total		0.40 / 1.00	

Question Explanation