Feedback — Union Find

You submitted this quiz on **Thu 18 Feb 2016 1:29 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 = 235096)
Give the id[] array that results from the following sequence of 6 union operations on a set of 10 items using the quick-find algorithm.

```
9-7 3-1 5-1 1-6 6-2 1-0
```

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

Recall: our quick-find convention for the union operation p-q is to change id[p] (and perhaps some other entries) but not id[q].

You entered:

```
0 0 0 0 4 0 0 7 8 7
```

Your Answer		Score	Explanation
0 0 0 0 4 0 0 7 8 7	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

The correct answer is: 0 0 0 0 4 0 0 7 8 7

Here is the id[] array after each union operation:

```
      0 1 2 3 4 5 6 7 8 9
9-7:  0 1 2 3 4 5 6 7 8 7
3-1:  0 1 2 1 4 5 6 7 8 7
5-1:  0 1 2 1 4 1 6 7 8 7
1-6:  0 6 2 6 4 6 6 7 8 7
6-2:  0 2 2 2 4 2 2 7 8 7
1-0:  0 0 0 0 4 0 0 7 8 7
```

Question 2

(seed = 155519)
Give the id[] array that results from the following sequence of 9 union operations on a set of 10 items using the weighted quick-union algorithm from lecture.

5-6 8-9 3-4 4-8 0-8 7-1 6-7 6-8 0-2

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

Recall: when joining two trees of equal size, our weighted quick union convention is to make the root of the second tree point to the root of the first tree. Also, our weighted quick union algorithm performs union by size (number of nodes) - not union by height - and does not do path compression.

You entered:

```
3 7 3 3 3 3 5 5 3 8
```

Your Answer		Score	Explanation
3 7 3 3 3 3 5 5 3 8	✔	1.00	
Total		1.00 / 1.00	

Question Explanation

```
The correct answer is: 3 7 3 3 3 3 5 5 3 8

Here is the id[] array after each union operation:

      0 1 2 3 4 5 6 7 8 9
5-6:  0 1 2 3 4 5 5 7 8 9
8-9:  0 1 2 3 4 5 5 7 8 8
3-4:  0 1 2 3 3 5 5 7 8 8
4-8:  0 1 2 3 3 5 5 7 3 8
0-8:  3 1 2 3 3 5 5 7 3 8
7-1:  3 7 2 3 3 5 5 7 3 8
6-7:  3 7 2 3 3 5 5 5 3 8
6-8:  3 7 2 3 3 3 5 5 3 8
0-2:  3 7 3 3 3 3 5 5 3 8
```

Question 3

```
(seed = 273826)
Which of the following id[] array(s) could be the result of running the weighted quick union
algorithm on a set of 10 items? Check all that apply.

Recall that our weighted quick union algorithm uses union by size (number of nodes)
and not union by height.
```

Your Answer		Score	Explanation
☑ 0 1 2 3 1 5 6 2 0 9	✔	0.20	0-8 2-7 1-4
☑ 6 0 6 6 0 3 6 0 4 6	✔	0.20	3-5 6-2 0-7 6-9 0-1 4-8 6-3 4-0 3-4
☐ 7 8 6 7 7 7 7 1 6 7	✔	0.20	The id[] array contains a cycle: 1->8->6->7->1
☐ 4 1 5 3 6 4 1 6 5 0	✔	0.20	Height of forest = 4 > lg N = lg(10)
☐ 5 4 0 5 4 4 0 4 7 5	✔	0.20	Size of tree rooted at parent of 5 < twice the size of tree rooted at 5
Total		1.00 / 1.00	

Question Explanation