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Exercises: Union Find

To specify an array or sequence of values in an answer, you must separate the values by a single space character (with no punctuation and with no leading or trailing whitespace). For example, if the question asks for the first ten powers of two (starting at 1), the only accepted answer is:

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 is used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

Question 1

(seed = 875712)
Give the id[] array that results from the following sequence of union operations on a set of 10 items using the quick-find algorithm.

5-7 2-4 4-3 5-3 9-7 9-8

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].

Question 2

(seed = 717824)
Give the id[] array that results from the following sequence of union operations on a set of 10 items using the weighted quick-union algorithm from lecture.

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

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.

Question 3

(seed = 952064)
Which of the following id[] array(s) could be the result of running the weighted quick union
algorithm on a set of 10 items?

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

- [ ] In accordance with the Honor Code, I certify that my answers here are my own work.

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