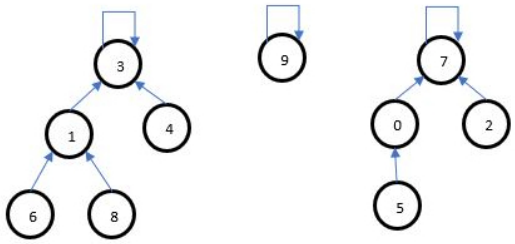
Congratulations! You passed!

Grade received 100% **Latest Submission Grade** 100% **To pass** 80% or higher

Go to next item

1 / 1 point



1. Consider the disjoint set forest above. Select all the correct facts from the list below.

- [x] Calling find(9) yields 9.

Correct
Correct.

- [x] Calling find(5) and find(4), we obtain 7 and 3 respectively, allowing us to conclude that 5 and 4 are not part of the same subset in the family.

Correct
Correct.

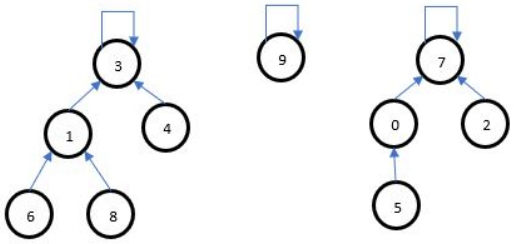
- [ ] The elements 6 and 5 belong to the same set.
- [x] The rank of the node 3 is 3.

Correct
Correct.

- [ ] The rank of the node 0 is 1.
- [x] 3, 9 and 7 are the representative elements for the three subsets shown.

Correct
Correct.

1 / 1 point



2. Consider once again the disjoint set forest shown above. Suppose we perform unions using the "rank strategy" presented in the lecture: i.e, the lower ranked tree becomes the child of the higher ranked one, with ties broken arbitrarily. Select all correct facts.

- [x] If we were to perform Union(6,9), the node 9 will become a child of the node 3.

Correct
Correct – according to the rank strategy 9 has a smaller rank than the node 3.

- [x] The tree with root 3 could have arisen through the following sequence of operations:

  MakeSet(1), MakeSet(6), MakeSet(3), MakeSet(4), MakeSet(8)

  Union(1,6), Union (1, 8), Union(3,4), Union(3,1)

  Correct
  Correct – The first two operations could have made 6, 8 the children of the node 1 and the third operation could make 4 the child of 3. The rank of 1 and 3 at this point are both 2. The last operation makes 3 the root and 1 its child giving rise to the tree that we see.

- [ ] The tree with root 3 could have arisen through the following sequence of operations:

  MakeSet(1), MakeSet(6), MakeSet(3), MakeSet(4), MakeSet(8)

  Union(3,1), Union (1, 8), Union(1,6), Union(1,4)

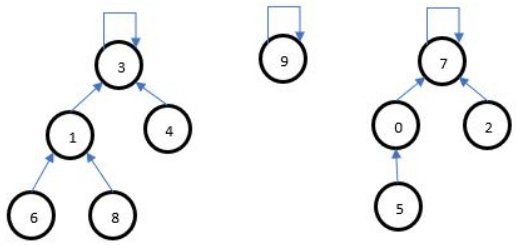
- [ ] The tree with root 3 could have arisen through the following sequence of operations:

  MakeSet(1), MakeSet(6), MakeSet(3), MakeSet(4), MakeSet(8)

  Union(1,6), Union (1, 8), Union(1,3), Union(1,4)

  (recommend drawing out the sequence of trees).

3. Consider the disjoint set forest below: 1 / 1 point



Select all the correct facts below assuming that we implement rank compression as explained in the lecture: i.e, whenever we perform a find, we connect all the nodes along the path from the query node to the root directly to the root.

- [x] When we perform find(5), all nodes in the corresponding tree connect to the root.

  Correct
  Correct.

- [x] Performing union(6,9) will involve connecting both the nodes 6 and 9 to the root 3.

  Correct
  Correct.

- [ ] When we perform find(6), all nodes in the corresponding tree connect to the root.