Assignment 2:

Question :

Which of the following arrays could not possibly occur during the execution of weighted quick union with path compression:

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

Solution:

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

   It is possible. Because each element is root.

2. 7 3 8 3 4 5 6 8 8 1

   3 is parent root. 1 is child root of 3. And 1 is parent root of 9. In weighted quick union 9 should be child root of 3 but here it is 1. So this is not a weighted quick union with path compression.

3. 6 3 8 0 4 5 6 9 8 1

   6 is parent root. 0 is child root of 6. 3 is child root of 0. In weighted quick union 3 should be child root of 6 but here it is 0. So this is not a weighted quick union with path compression.

4. 0 0 0 0 0 0 0 0 0 0

   This is possible because all have a single parent node 0.

5. 9 6 2 6 1 4 5 8 8 9

   This is possible because all the roots have a single child root. And weighted union is applied.

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

   Not possible. Here all parent and child roots are cyclic.