Assignment #8

Due Date: Saturday, November 7 at 11:59pm

Submit: eLearning

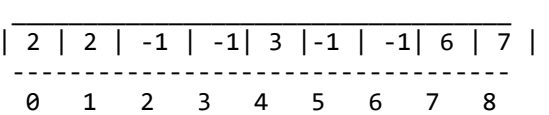
Late Policy: -10 points per hour late

Instructions: This is an individual assignment. Answers should be your own work.

Chapter 8

100 points total

10 points
1) Given the array below representing disjoint sets, draw the associated trees.



15 points
2) Using a set of values from 0 to 5 as separate roots, perform the following unions by making the root of the second tree be a child of the root of the first tree. What do you notice about the resulting tree and what consequence would it have on a find(5)?

union(4, 5)
union(3, 4)
union(2, 3)
union(1, 2)
union(0, 1)

15 points
3) Using a set of values from 0 to 8 as separate roots, perform the following unions using union-by-size. Show the result of each union. When sizes are the same, make the second tree be a child of the first tree.

Notice the finds return roots, and a union will union two roots.

union(find(0),find(2))
union(find(0),find(3))
union(find(0),find(4))
union(find(0),find(7))
union(find(1),find(5))
union(find(6),find(8))
union(find(5),find(8))
union(find(7),find(8))

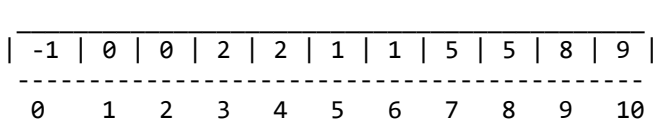
10 points
4) Illustrate the array for the final forest of the previous problem (note that roots are not simply -1 when using union-by-size).

15 points
5) Same as #3, but using union-by-height. When heights are the same, make the second tree be a child of the first tree.

10 points
6) Illustrate the array for the final forest of the previous problem (note that roots are not simply -1 when using union-by-height).

15 points

7) Given the disjoint set array shown, what would the array look like after a find(10) if path compression is used?



-1	0	0	2	2	1	1	5	5	8	9
0	1	2	3	4	5	6	7	8	9	10

10 points

8) Illustrate the trees for the final forest of the previous problem.

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hw8.doc (.doc can be .txt, .jpg, etc.)