

CS 2420 Fall 2008
Written 6 – 10 Points
Due November 10, 2008

1. Perform the following sequence of operations on a disjoint set data structure:
 - a. union(1,2)
 - b. union(3,4)
 - c. union(3,5)
 - d. union(1,7)
 - e. union(3,6)
 - f. union(8,9)
 - g. union(1,8)
 - h. union(3,10)
 - i. union(3,11)
 - j. union(3,12)
 - k. union(3,13)
 - l. union(14,15)
 - m. union(16,0)
 - n. union(14,16)
 - o. union(1,3)
 - p. union(1,14)

Show the result using the implicit representation as an array (see Figure 8.5 in the textbook) when the unions are performed

- a. by linking the second tree to the first tree;
 - b. by size;
 - c. by height.
2. Prove that for every maze generated by the algorithm in Section 8.7, the path from the starting cell to the ending cell is unique if retracing is disallowed.
3. Design an algorithm that generates a maze that contains no path from the starting cell to the ending cell, but has the property that the removal of a prespecified wall creates a unique path (if retracing is disallowed).

Submit a single document, with the names of the people submitting, to eagle or hand the assignment to me in class.