CSE 3318

Homework 3

(1) = essential, (2) = important insight, (3) = more challenging, (C) = code available

1. (22.1-2, 3rd) 20.1-2 (1)

2. (22.1-5, 3rd) 20.1-5 (3)

3. (22.2-1, 3rd) 20.2-1 (1)

4. (22.2-4, 3rd) 20.2-4 (1)

5. (3rd, Do a DFS on figure 22.6 (p. 611).) Do a DFS on figure 20.6 (p. 571). Classify each edge based on the DFS tree you determine. (1C)

6. Find the strongly connected components in (3rd, figure 22.6) figure 20.6. (1C)

7. (22.4-1, 3rd) 20.4-1 (1)

8. (22.5-1, 3rd) 20.5-1 (1)

9. (22.5-3, 3rd) 20.5-3 (2)

10. (22.5-4, 3rd) 20.5-4 (2)

11. (23.1-1, 3rd) 21.1 (2)

12. (24.3-1, 3rd) 22.3-1 (1)

13. a. Determine the transitive closure of the following Boolean matrix by using Warshall's algorithm. (1)

$$
\begin{array}{ccccc}
1 & 0 & 1 & 1 & 0 \\
0 & 0 & 1 & 1 & 0 \\
1 & 0 & 0 & 0 & 0 \\
1 & 0 & 1 & 1 & 1 \\
0 & 0 & 0 & 1 & 0 \\
\end{array}
$$

b. Convert the matrix to indicate successors and use the version of Warshall's algorithm that allows path tracing. (1C)

14. (26.2-2, 3rd) (1) 24.2-2 (1)

16. (26.2-3, 3rd) (1C) 24.2-3 (1)

17. (26.3-1, 3rd) (1C) 24.3-1 (1)