CS/Math 240: Intro to Discrete Math 4/21/2011

Grading Key for Homework 9

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Problem 1 (7 points)

Problem 2 (9 points)

- 6pts for Part a
- 3pts for Part b

Problem 3 (7 points)

- 2 pts for Part a
- 1.5 pts for Part b
- 2pts for Part c
- 1.5 pts for Part d

Problem 4(12 points)

Problem 5 (5 points)

- 2 pts for part a
- 3 pts for part b

Common Mistakes

- On problem 1, some have tried to prove that a tree follows $| V | = | E | + 1$ instead of proving that a connected graph with $| V | = | E | + 1$ is a tree.
- In problem 4, for languages L2 to L4 you need to provide an explanation of how you arrived at your finite state automaton. Also, you need to make sure to disallow strings with leading zeros. Another common mistake was not including 0 as a multiple.
- On problem 5a, a number of people gave a four-state FA, with states representing (no. of greens > 3, no. of reds > 3), (no. of greens ≤ 3, no. of reds > 3), and the other two combinations. Presumably this was to represent that exchanges cannot occur with less than three reds. However, this did not distinguish the 5-5 state (which should accept, but not be reachable). Further, this FA had multiple transitions on an exchange from (no. of greens$>$ 3, no. of reds > 3), violating the finite automaton description.
- For part 5b, many people stated that, since any number of exchanges alone will not change (r + g), and since any number of swaps alone will move r closer to 5, but g further away, (5,5) was unreachable. This reasoning fails to take into account alternating choices of swaps/exchanges.