

CS5000: Assignment 3

Due: Sept. 19, 2008 by 11:59pm

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Problem 1: 1 point

Prove or disprove:

- $L = \{a^n b^* c^n\}$ is regular.
- $L = \{xx^R\}$ is regular if $|\Sigma| = 1$.

Problem 2: 1 point

- Here is an old well-known puzzle. A man travels with a wolf, a goat, and a cabbage. He comes across the east bank of a river he needs to cross. He sees a tiny boat near the bank. Unfortunately, the boat can carry the man plus one other item. If the man leaves the wolf and the goat on the same bank, the wolf will eat the goat. If the man leaves the goat with the cabbage, the goat will eat the cabbage. A solution to the puzzle is a sequence of moves that allows the man to cross the river with the wolf, the goat, and the cabbage with no unhappy accident. The moves can be represented as follows:
 1. w - "The man crosses with the wolf.";
 2. g - "The man crosses with the goat.";
 3. c - "The man crosses with the cabbage.";
 4. n - "The man crosses with nothing in the boat."
- Implement a DFA that takes strings over $\{w, g, c, n\}$, i.e., $gcwnng$, and accepts those strings that represent solutions to the puzzle.
- You can code in either C/C++ or Java.
- You have to submit your source code through Eagle.
- Submit a short README file that gives an example of how to run your program after compilation. For example, "java Puzzle gcwnng" or "hw32.exe gcwnng."