CpSc 3500 — Goddard — Fall24

Assignment 6

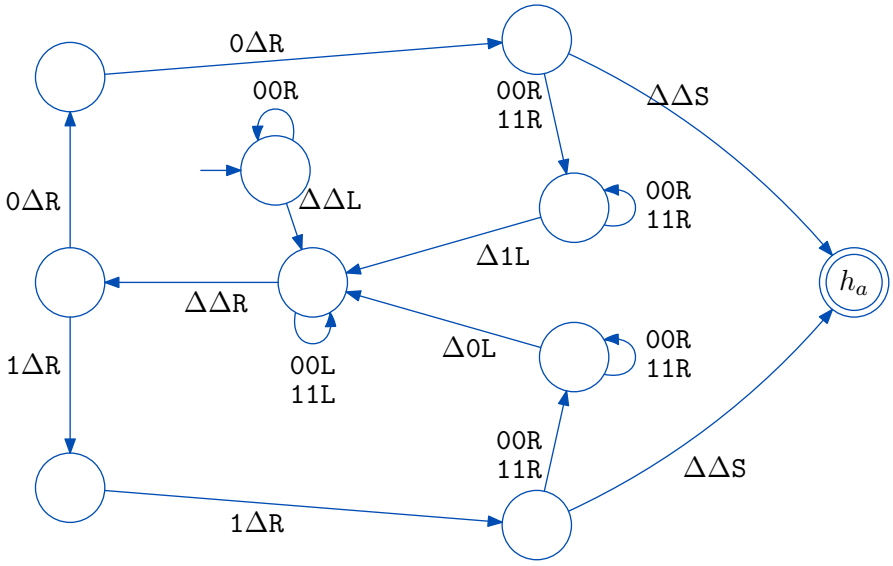
(Please work in groups of two or three and submit one answer sheet for the group.)

1. Prove that if L is a regular language and M is a context-free language, then the intersection $L \cap M$ is context-free.

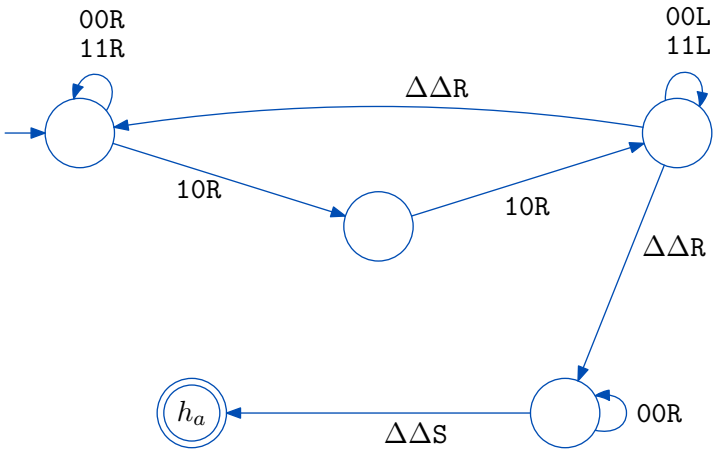
2. Examine the context-sensitive grammar given in the slides `https://people.computing.clemson.edu/~goddard/handouts/cpsc3500/MATERIAL/generalGrammars.pdf`. Provide the derivation of `000111222`.

3. Let F be the language of all binary palindromes that contain the substring `011`. (For example, `001011110100` is in F.)
   (a) Explain in English a TM for F.
   (b) Draw your TM.

4. Determine the language of the following TM.



5. Consider the following ***nondeterministic*** TM.



(a) Give one string of length 3 that is accepted.

(b) Give one string of length 3 that is not accepted.

(c) Express in succinct English the language of this TM. (Be precise.)

Due: Monday October 28