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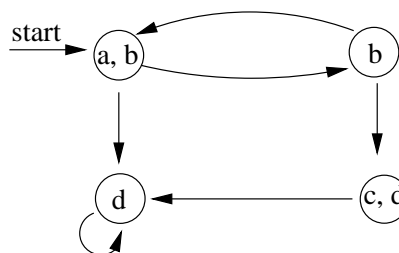
Assignment 6

1 Modeling an Automaton

This problem asks you to create two SMV models. Please email your models to the TA (mtschant@cs.cmu.edu).

Your models will be tested with NuSMV, so please make sure they work with that implementation of SMV. See <http://www.cs.cmu.edu/~mtschant/15414-f07/nusmv.html> for more information on NuSMV.

Consider the automaton given below:



and the following CTL formulas:

- a
 - $\mathbf{EG} \, b$
 - $\mathbf{AG} \, b$
 - $\mathbf{AG} \, \mathbf{EF} \, b$
 - $\mathbf{AG} \, \mathbf{EF} \, d$
 - $\mathbf{EF} \, c$
 - $\mathbf{AG} \, \mathbf{EF} \, c$
 - $\mathbf{A}[b \, \mathbf{U} \, c]$
 - $\mathbf{A}[b \, \mathbf{U} \, d]$
- (a) Encode the above automaton as an SMV model using the unary encoding. That is, use one variable to represent the current state. Have that variable range over the four possible states. Also encode the CTL formulas as specifications that can be checked of the model. (Please keep them in order.) Name this file **a.smv**.
 - (b) Encode the above automaton as an SMV model using the binary encoding. That is, use two boolean variables to represent the current state. Also encode the CTL formulas as specifications that can be checked of the model. (Please keep them in order.) Name this file **b.smv**.