NuSMV Exercises*

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Formal Methods Lab Class, May 23, 2014

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*These slides are derived from those by Stefano Tonetta, Alberto Griggio, Silvia Tomasi, Thi Thieu Hoa Le for FM lab 2011/13

An 8-bit Adder

Write an SMV program to compute the sum of two 8-bit numbers. You may use the 1-bit adder we have seen in the lab lessons to implement such an adder. The 8-bit adder takes as input two 8-bit arrays and producing as output another 8-bit array and an overflow bit. You should check the following requirements with NuSMV *using Bounded Model Checking (BMC):*

REQ : Eventually the adder finishes its job.

REQ : As soon as the adder finishes its job, the result is actually the sum of the two operands.

REQ : The addition is a commutative operation. That is $in1 + in2 = in2 + in1$.

Missionaries and Cannibals Problem

Description Three missionaries and three cannibals want to cross a river but they have only one boat that holds two. If the cannibals ever outnumber the missionaries on either bank, the missionaries will be eaten. *The boat cannot cross the river by itself with no people on board.* The problem consists of finding a strategy to make them cross the river safely.

Exercise Implement in SMV a system that encodes the above problem, and prove with NuSMV that there exists a solution to the problem, by checking the appropriate CTL property and recording the counterexample generated.