Model Checking Homework 2

Deadline: 25 March 4:00pm
Send solution to: modelchecking@iaik.tugraz.at

Consider the following synchronous Kripke structure K.
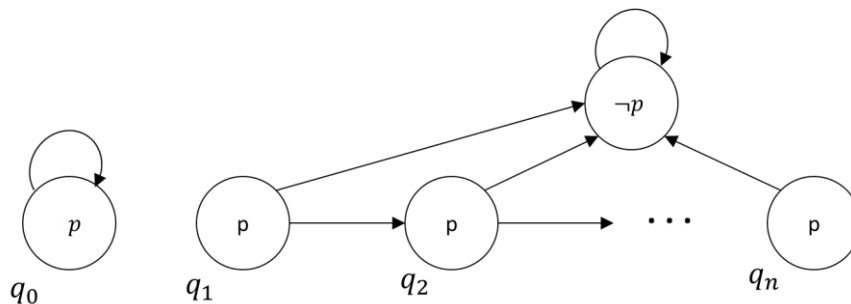
We wish to prove that *p* is always true.

Task 2a. [5 points]

Suppose that q_1 is the initial state. Suppose you are given formulas R, S_0, and p for the transition relation, the initial states and the property, resp.

- What is the smallest *k* such that BMC finds a counterexample?
- Show the BMC formula, using R, S_0, and p.
- Is the formula satisfiable? Explain.

Task 2c. [5 points]

Suppose that q_0 is the initial state. The new formula for the initial states is S'_0.

- What is the smallest *k* such that k-induction can prove the property correct?
- Suppose *n=2*. Choose an appropriate *k* and show the k-induction formula, using R, S'_0, and p.
- Is the formula satisfiable? Explain.