Universität Koblenz-Landau

FB 4 Informatik

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January 18, 2017

Exercises for "Formal Specification and Verification"
Exercise sheet 6

Exercise 6.1:
Prove the following equivalences of CTL formulae:

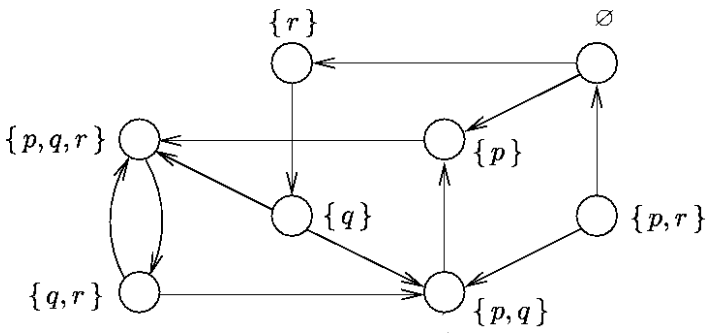
(1) $\neg E\Diamond F \equiv A\Box\neg F$

(2) $E(F\mathcal{U}G) \equiv G \vee (F \wedge E \bigcirc E(F\mathcal{U}G))$

(3) $E\Box F \equiv F \wedge E \bigcirc E\Box F$

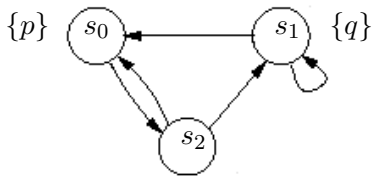
(4) $\neg A(F\mathcal{U}G) \equiv E(\neg G\mathcal{U}(\neg F \wedge \neg G)) \vee E\Box\neg G$

Exercise 6.2:
Consider the following transition system:



- Compute $sat(E(p\mathcal{U}q))$ using the algorithm presented in th electure from Tuesday, 24.01.2017.
- Use the system NuSMV to compute $sat(E(p\mathcal{U}q))$.

Exercise 6.3:
Consider the following transition system:



- Compute $sat(E(q \mathcal{U} p))$.
- Apply the algorithm presented in the lecture from Tue, 24.01.17 – using OBDDs in the ordering [p, q] to represent sets of states and transitions – to compute the set of states of this transition system which satisfy $E(q \mathcal{U} p)$.

Please submit your solution until Wednesday, 25.01.2017 at 12:00. Please do not forget to write your name on your solution.

Submission possibilities:

- By e-mail to `mbender@uni-koblenz.de` with the keyword "Homework FSV" in the subject.
- Hand it in to me (Room B225) or drop it in the box in front of Room B224.