

Introduction to Model Checking Summer term 2010

– Series 10 –

Hand in on July 14 before the exercise class.

Exercise 1

(1 + 1 points)

Transform the CTL-formula $\Phi = \neg\forall\Diamond(\forall(\forall\Box b) \cup (\forall\Box a))$ into an equivalent CTL-formula in

- (a) existential normal form and
- (b) positive normal form.

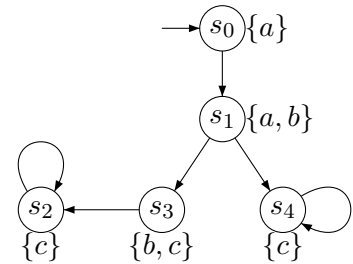
Exercise 2

(4 points)

Consider the following CTL-formula

$$\Phi = \forall(a \cup \forall\Diamond c)$$

and the transition system outlined on the right. Decide whether $TS \models \Phi$ using the CTL model checking algorithm from the lecture. Sketch its main steps!



Exercise 3

(4 points)

Consider the CTL-formula $\Phi = \forall\Box(a \rightarrow \forall\Diamond(b \wedge \neg a))$ together with the following CTL fairness assumption

$$\begin{aligned} fair = & \Box\Diamond\forall\Box(a \wedge \neg b) \rightarrow \Box\Diamond\forall\Box(b \wedge \neg a) \\ & \wedge \Box\Diamond\exists\Diamond b \rightarrow \Box\Diamond b. \end{aligned}$$

Prove that $TS \models_{fair} \Phi$!

