Exercises PV 09/10

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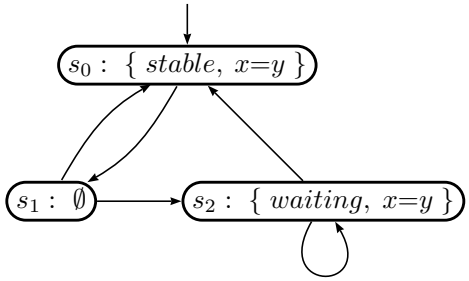
1 LTL Model Checking

1. Consider the Kripke structure K depicted below. The states are $\{ s_0, s_1, s_2 \}$, with s_0 as the innitial state. We use $Prop = \{ stable, waiting, x{=}y \}$. Which propositions hold (and otherwise) at each state can be seen below.



   (a) Consider the property ϕ given as: $\Box(waiting \rightarrow (waiting\ \mathbf{W}\ stable))$. What does it say?

   (b) What is its negation?

   (c) Give a Buchi automaton $A_\neg$ that represent this negation.

   (d) Construct the automaton $K \cap A_\neg$.

   (e) So, does K satisfies the property ϕ?

2. Verify whether in the K above eventually $x{=}y$ will remain to hold.

3. Verify whether the K from No. 1 satisfies the following properties:

   (a) $\Box\Diamond(x = y)$

   (b) $\neg waiting\ \mathbf{U}\ (waiting \wedge x{=}y)$