ALBERT-LUDWIGS-
UNIVERSITÄT FREIBURG

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Room: 101 SR 01-016

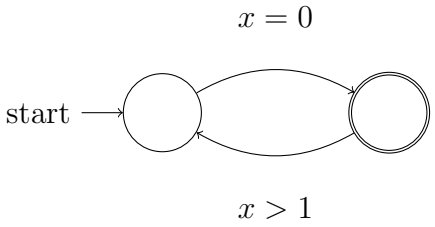
Tutorials for Cyber-Physical Systems I - Model Checking
Exercise sheet 7

Exercise 1: LT Properties

Consider the set AP of atomic propositions defined by $AP = \{x = 0, x > 1\}$ and consider a nonterminating sequential computer program P that manipulates the variable x.
For example, the property "the value of x alternates between zero and a value larger than one" can be expressed by the ω-regular expression

$$((x = 0).(x > 1))^{\omega}$$

and by the NBA



For each of the following informally stated properties, please give an ω-regular expression and an NBA:

(a) initially x is equal to zero

(b) initially x differs from zero

(c) initially x is equal to zero, but at some point x exceeds one

(d) x exceeds one only finitely many times

(e) x exceeds one infinitely often

(f) *true*

(*) how about the property *false*? Is there an ω-regular expression that represents it?

Exercise 2: Lecture Evaluation (optional)
We would like to make sure you are following the lecture and having fun at the same time.

(a) What can we improve about the lecture?

(b) Briefly name the main concepts that you have found interesting and what you have learned about them during the last lectures.