WS 2011-2012 27.10.2011

Exercises to the Lecture FSVT

Prof. Dr. Klaus Madlener sheet 2

Exercise 1:

1. Model the state of the Euclidean algorithm as abstract state.
2. Prove that the Euclidean algorithm can be viewed as a sequential algorithm.
3. Model the state of a Moore automaton with abstract state.
4. Prove that Moore Automata can be viewed as sequential algorithms.
5. Model the state of Turing machines as abstract state.
6. Prove that Turing machines can be viewed as sequential algorithms.

Exercise 2:

Let A be a sequential algorithm with set of critical terms T. Let R_A^X be the update rule of A in the state X as considered in consequence 3.10 on slide 59 of the lecture. Let the equivalence relation E_X on a state X be defined by

$$E_X(t_1, t_2) \Longleftrightarrow Val(t_1, X) = Val(t_2, X)$$

on the set of critical terms T. Let states X, Y be called T-similar, if $E_X = E_Y$.

Prove:

1. If the states X, Y coincide on T, then $\Delta(R_A^X, Y) = \Delta(A, Y)$.
2. Let X, Y be states and $\Delta(R_A^X, Z) = \Delta(A, Z)$ for a state Z isomorphic to Y, then $\Delta(R_A^X, Y) = \Delta(A, Y)$ as well.
3. Let T be a set of ground terms. If X and Y are T-similar, then there is a state Z which is isomorphic to X and coincides with Y over T.
4. If X and Y are T-similar states, then $R_A^X = R_A^Y$.

Delivery: until 03.11.2011,
by E-Mail to huechting@informatik.uni-kl.de