Automata and Grammars

Seminar 6

1. Let L be a regular language. Decide whether language $K = \{w | \#w\$ \in L\}$ is regular and justify your answer.

2. Assume finite automaton $A = (Q, X, \delta, q_0, F)$. Construct two way automata, that accepts the following languages:
   a) $L_1 = \{\#w\$ | ww^R \in L(A)\}$
   b) $L_2 = \{\#w\$ | ww \in L(A)\}$
   c) $L_3 = \{\#w\$ | (\exists v \in X^*) wv \in L(A) \wedge |w| = |v|\}$
   d) $L_4 = \{\#w\$ | (\exists u, v \in X^*) w = uv \wedge uu^R v \in L(A)\}$

3. Construct non-deterministic finite automaton that accepts language $L_1 = \{\#w\$ | ww^R \in L(A)\}$. Do not use the knowledge of two way automata for the construction.

4. Describe the principle of construction of an equivalent finite automaton for a given two way automaton.

5. Construct (non-deterministic) finite automata that accept languages L_1, L_2, L_3, L_4. Use the knowledge of two way automata in the construction.

6. Use the proposition regarding the regularity of regular substitution for deciding whether texts conforming to the syntax of simplified HTML (seminar 4, problem 3) form a regular language.