ANKARA UNIVERSITY COM364 AUTOMATA THEORY

Week 7

Example Questions

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EXAMPLE QUESTION 1

The following language is the intersection of two simpler languages. Construct DFAs for the simpler languages, then combine them to give the state diagram of a DFA for the language given. $\Sigma = \{a, b\}$.

$\{w \mid w$ has at least three a's and at least two b's$\}$

EXAMPLE QUESTION 2

The following language is the complement of a simpler language. Construct a DFA for the simpler language, then combine use it to give the state diagram of a DFA for the language given. $\Sigma = \{a, b\}$.

$\{w \mid w$ contains neither the substrings ab nor ba$\}$

EXAMPLE QUESTION 3

Design a NFA for the language $1^*(001^+)^*$ with three states.

EXAMPLE QUESTION 4

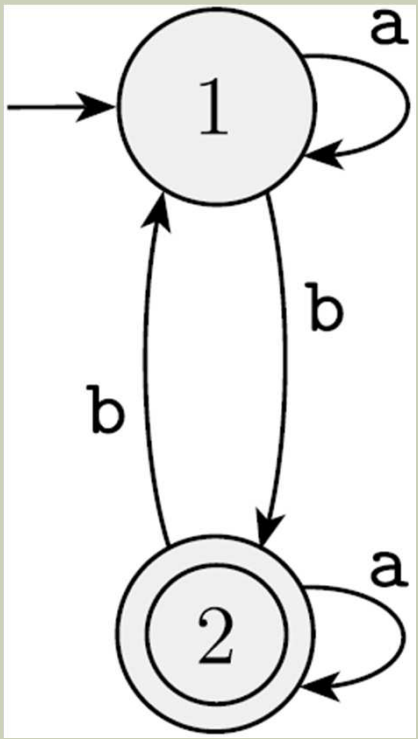
Let F be the language of all strings over {0,1} that do not contain a pair of 1s that are separated by an odd number of symbols. Give the state diagram of a DFA with five states that recognizes F. (You may find it helpful first to find a 4-state NFA for the complement of F.)

EXAMPLE QUESTION 5

Use the procedure we saw in the course to convert the regular expression $(0 \cup 1)^*000(0 \cup 1)^*$ to a NFA.

EXAMPLE QUESTION 6

Use the procedure we saw in the course to convert the automaton below to a regular expression.



EXAMPLE QUESTION 7

Use the pumping lemma to show that the following language is not regular.

$$A_2 = \{www \mid w \in \{a, b\}^*\}$$