DatZ1037: Automata Theory

Autumn 2019 — Instructor: Abuzer Yakaryılmaz

EXAM 2 (duration: 75 minutes)

Name and surname:

Date: Tuesday, November 26, 2019

Questions

(There are 5 questions with total 10 points.)

For each of the following languages, give the state diagram of a deterministic or nondeterministic finite automaton (DFA or NFA) recognizing it.

1) $L_1 = \{a^i \mid i \equiv 1 \mod 3 \text{ or } i \equiv 2 \mod 5\}$, where the alphabet is $\Sigma = \{a\}$. (2 points)

2) $L_2 = \{a^i \mid i \equiv 1 \mod 3 \text{ and } i \equiv 3 \mod 4\}$, where the alphabet is $\Sigma = \{a\}$. (2 points)

3) $L_3 = \{w \mid w \text{ contains the substring } aab\}$, where the alphabet is $\Sigma = \{a, b\}$. (2 points)

4) $L_4 = \{w \mid w \text{ does not contain the substring } bbb\}$, where the alphabet is $\Sigma = \{a, b\}$. (2 points)

5) $L_5 = \{w \mid \text{the third symbol of } w \text{ from the end is symbol } b\}$, where the alphabet is $\Sigma = \{a, b\}$. (2 points)