

Homework 1

COSE215, Spring 2017

Hakjoo Oh

Due: 3/29, 09:00 (in class)

Problem 1 (10pts) Design a DFA (deterministic finite automata) that accepts the following language:

$$L = \{a^m b^n \mid m, n \geq 1\}$$

Problem 2 (10pts) Design an NFA (nondeterministic finite automata) that accepts the language in Problem 1.

Problem 3 (10pts) Design a DFA that accepts the following language:

$$L = \{w \in \{a, b\}^* \mid w \text{ does not end with } bb\}$$

Problem 4 (10pts) Design an NFA that accepts the language in Problem 3.

Problem 5 (10pts) Design an NFA that recognizes the following set of strings:

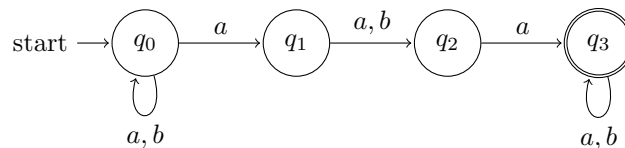
$$L = \{2016, 0331\}$$

where assume that Σ is the set of digits.

Problem 6 (10pts) Design an ϵ -NFA that accepts the following language:

$$L = \{a^m b^n c^o \mid m, n, o \geq 0\}$$

Problem 7 (20pts) Convert the following NFA to a DFA:



Problem 8 (20pts) Consider the following transition table of a ϵ -NFA:

p				
q				
r				

where p is the initial state and r is the final state.

1. (10pts) Compute the ϵ -closure(ECLOSE) of each state.
2. (10pts) Convert the automaton to a DFA.