Homework 1
COSE215, Spring 2018

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Due: 4/3, 14:00 (in class)

Problem 1 (10pts) Design a DFA (deterministic finite automata) that accepts the following language:
$$L = \{w00 \mid w \in \{0,1\}^*\}$$

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:

$$L = \{u00v \mid u, v \in \{0,1\}^*\}$$

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

Problem 5 (10pts) Design an NFA that recognizes the following sets of strings:
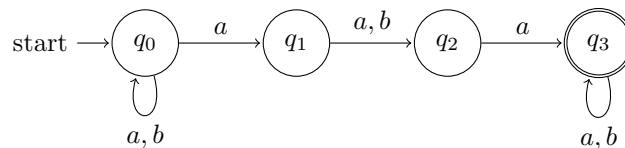
$$L = \{\texttt{theory}, \texttt{dfa}\}.$$

where assume that Σ is the set of lowercase letters.

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:

	ϵ	a	b	c
p	$\emptyset$	$\{p\}$	$\{q\}$	$\{r\}$
q	$\{p\}$	$\{q\}$	$\{r\}$	$\emptyset$
r	$\{q\}$	$\{r\}$	$\emptyset$	$\{p\}$

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.