

COMPUTER SCIENCE 3630
Theoretical Foundations of CS
Assignment #1

Spring 2012

Due: Wed. Feb 1, 2012 at 2 p.m.

Late Penalty: -10% per day late

Finite Automata and Regular Expressions

1. Regular expressions

Find regular expressions that describe each of the following languages on $\Sigma = \{0,1\}$

- (a) all strings containing an odd number of 1's.
- (b) all strings containing at least two 0's.

2. Finite Automata

Draw a Non-Deterministic Finite Automata for the following language on $\Sigma = \{0,1\}$.
 $L =$ all strings that do not contain the substring 110.

3. NFA to DFA

Convert the following NFA to a DFA using the subset construction technique – Draw the state diagram for both. State q_0 is the start state, and q_1 is the only accepting state.

Q	Σ	δ
q_0	0	$\{q_0, q_1\}$
q_0	1	$\{q_1\}$
q_1	0	$\{q_2\}$
q_1	1	$\{q_2\}$
q_2	0	ϕ
q_2	1	$\{q_2\}$