Homework

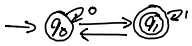
3.) Don't Contain 110

Ok 0010100
Ok 01011111
Not ok 01110101

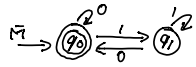
5.) DFA M recognizes language L

Create DFA $\bar{M}$
M, $\bar{M}$ have the same State
" " " transition
" " " Start state

States find in M, not found in $\bar{M}$ and vice versa
Find language recognized by $\bar{M}$



M recognizes strings ending in 1
Language L



$\bar{M}$ recognizes string ending in a 0

Notes

Regular Operations

Def: If A and B are languages then
$A \cup B = \{w \mid w \in A \text{ or } w \in B\}$
↑ union
(usually A, B have the same alphabet)

Concatenation - $A \circ B = \{xy \mid x \in A \text{ and } y \in B\}$

Star - $A^* = \{x_1, x_2, \ldots, x_k \mid k \geq 0 \text{ and each } x_i \in A\}$

When k=0, you have the empty string,
denoted ε ← Epsilon

$\Sigma = \{0,1\}$
$A = \{10, 0, 11\}$
$B = \{011, 1, 01\}$
$A \cup B = \{10, 0, 11, 011, 1, 01\}$
$A \circ B = \{10011, 101, 1001,$
$0011, 01, 001$
$11011, 111, 1101\}$

$A^* = \{\varepsilon, 10, 0, 11, 1010, 100$
$1011, 010, 00, 011, 1110$
$110, 1111, 101010, 1000$
$101111, \ldots\}$

Regular languages are closed under the operation
$\cup, \circ, *$

$\{w \mid w$ has an even number of 0's
and an even number of 1's$\}$ Not a regular language

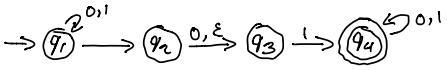
1.2

Nondeterministic Finite Automata (NFA)

There can be multiple possible transition with a given input.

The empty string ε can be input.

The NFA can have no transition for a particular input



001 could end in q_1 or q_2 or q_3
but not q_4, Not recognized by NFA.