

Homework #2  
CS322/KAIST 2011 Fall  
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**Exercise 1 (10pt)** Construct DFA accepting each of the following languages.

- a)  $\{w \in \{0, 1\}^* \mid \text{each } 0 \text{ in } w \text{ is immediately preceded by a } 1\}$ .
- b)  $\{w \in \{0, 1\}^* \mid w \text{ has neither } 00 \text{ nor } 11 \text{ as a substring}\}$ .

**Exercise 2 (10pt)** Construct DFA accepting languages which have 10100 as a) prefix, b) substring, and c) postfix.

**Exercise 3 (10pt)** Let  $M = (\{p, q, r, s\}, \{0, 1\}, \delta, p, \{s\})$  be an NFA given by

$\delta$	0	1
p	{p, q}	{p}
q	{r}	{r}
r	{s}	$\emptyset$
s	{s}	{s}

- a) Give all the strings of length three or less accepted by the automaton.
- b) Convert the automaton to a DFA