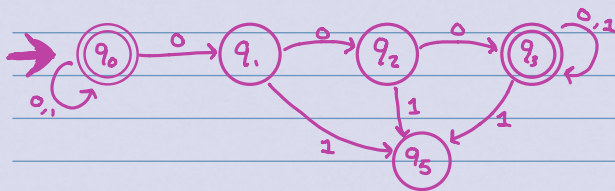Jessica Noel & Jack Schniederhan

"I pledge my honor that I have abided by the Stevens Honor System."
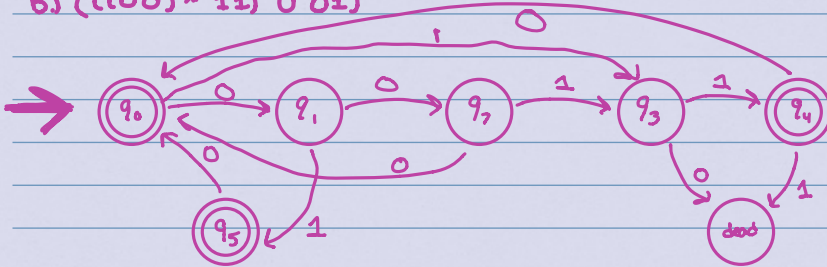
Problem 1

Construct an equivalent NFA

a.) $(0 \cup 1)^* 000 (0 \cup 1)^*$

b.) $((00)^* 11) \cup 01)^*$

c.) $\emptyset^*$

Problem 2

Give regular expressions to generate each language below

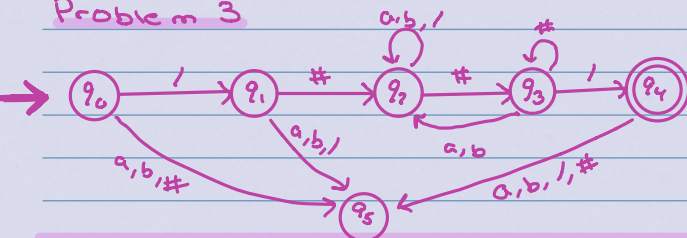a.) $\{w \in \{a,b\}^* : w \text{ does not end in } ba\}$

$\Sigma^* ((aa) \cup (bb) \cup (ab))^*$

b.) $\{w \in \{0,1\}^* : w = \alpha\beta, \alpha \text{ has an even number of 1's and } \beta \text{ has an even number of 0's}\}$

$\alpha = \{11\}^* \qquad \beta = \{00\}^*$

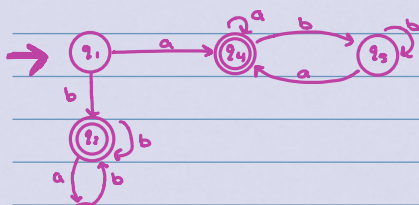$((11)^* (00)^* (0101)^* (1010)^* (0110)^* (1001)^*)^*$

Problem 3

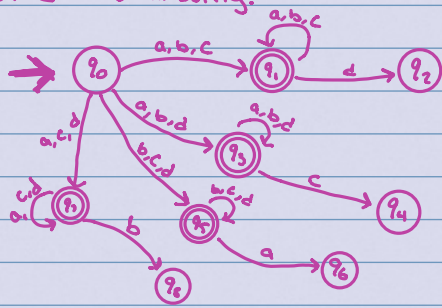$(1\#)(a \cup b \ \ \cup \ (\#^* (0 \cup b)))^* (\#1)$

Problem 4

a.) $\{w : w \text{ starts and ends with the same symbol}\}$

$a \circlearrowleft q_3$

b.) Let $\Sigma = \{a, b, c, d\}$. The language L consists of all strings in which at least one symbol of Σ is missing.

[diagram: states $q_0, q_1, q_2, q_3, q_4, q_5, q_6, q_7$ with transitions labeled a,b,c; a,b,c; d; a,b,d; a,b,d; a,c,d; b,c,d; c; b,c,d; c,d; a; b; a]

c.) $\{w : w$ has even length and an odd number of $a's\}$

[diagram: states q_1, q_2, q_3, q_4 with transitions labeled a, a, b, b, b, b, a, a]