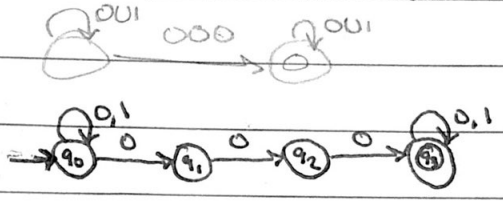
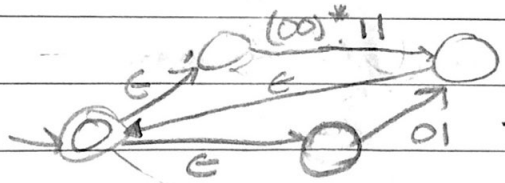
Julia Nelson Problem Set 3 "I pledge my honor that I have abided by the Stevens Hs"

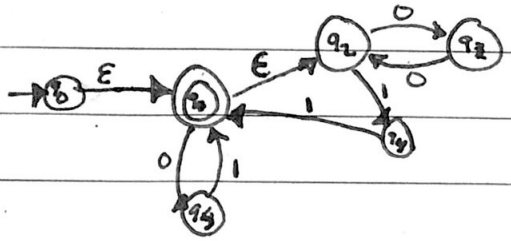
## Problem 1

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

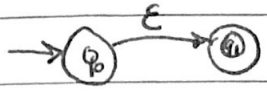



b) $((((00)^* 11) \cup 01)^*$




c) $\emptyset^* = \{\epsilon\}$



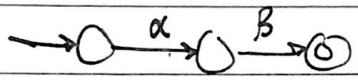
Pledge JNelson

## Problem 2

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

$((a \cup b)^* (b \cup aa))^*$

b. $\{w \in \{0,1\}^* : w = \alpha \circ \beta$ $\alpha$ has even # 1s, $\beta$ has even # 0s




even # 1s: $(0^*10^*10^*)^*$

even # 0s: $(1^*01^*01^*)^*$

$(0^*10^*10^*)^* (1^*01^*01^*)^*$

Pledge Nelson

## Problem 3

$\Sigma = \{a, b, /, \#\}$

must begin /#
end #/

$/\#\,(a \cup b)^* \,\#/$

missing if just / or #

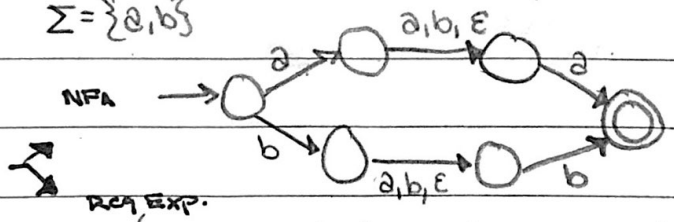
$/\#\,(a^* \cup b^* \cup /^* \cup (\#^*(a \cup b))^*)^* \,\#/$

$/\#\,(a \cup b \cup / \cup (\#^*(a \cup b))^*)^* \,\#/$

## Problem 4

a. $\{w : w$ starts & ends w/ same symbol$\}$

$\Sigma = \{a, b\}$




$(a(a \cup b)^* a) \cup (b(a \cup b)^* b)$

b. $\Sigma = \{a, b, c, d\}$ L consists of all strings in which at least 1 symbol is missing

$(b \cup c \cup d)^* \cup (a \cup c \cup d)^* \cup (a \cup b \cup d)^* \cup (a \cup b \cup c)^*$

pledge
antelope

4 continue

c. $\{w : w$ odd # a's and is even length