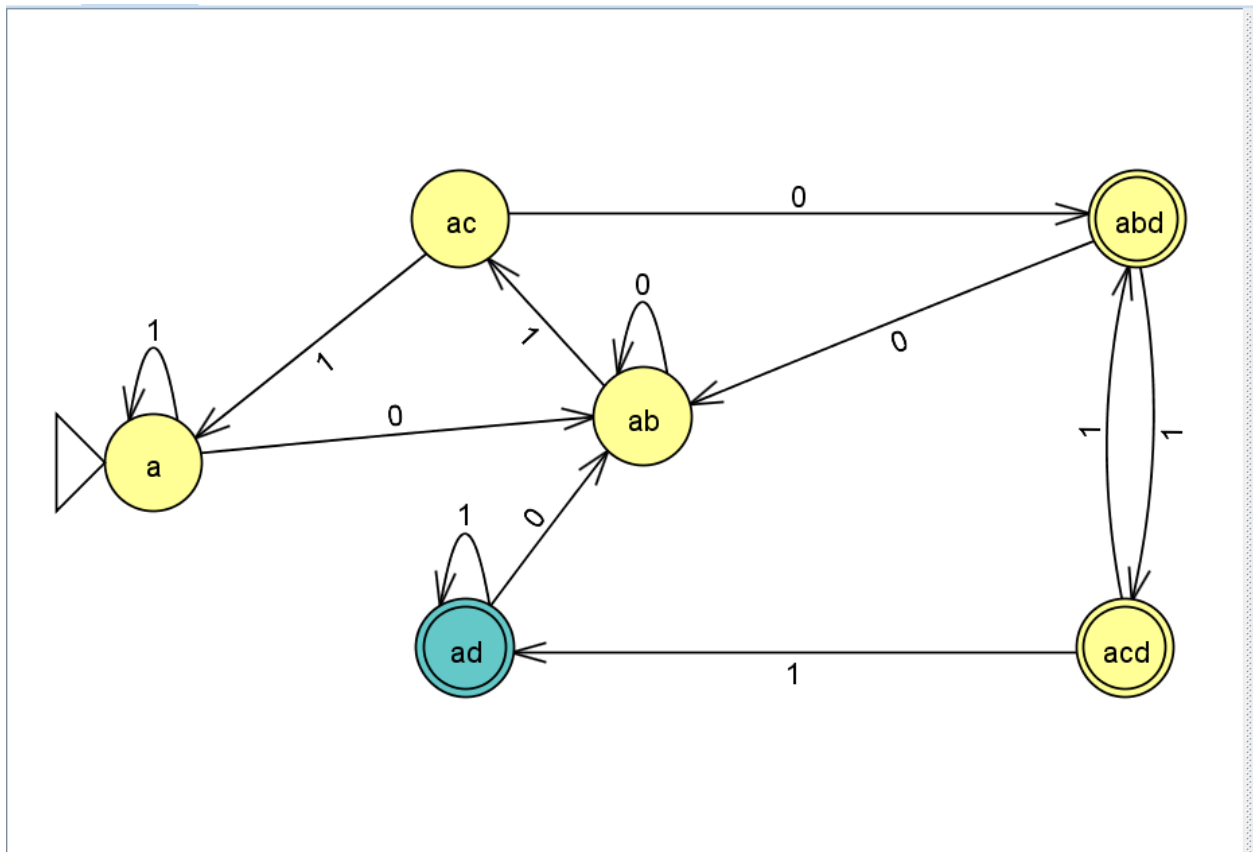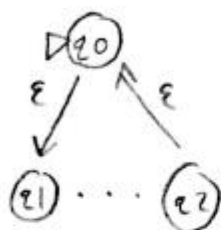Hayden Shelton
U0658884
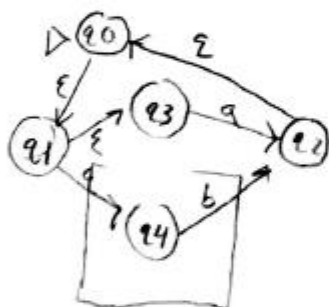CS3100 Fall '14

**PS2-2**

(a)



(b) (next page)

Convert $(a + ab^*)^*$ into an NFA.
Strategy: break regex into smaller NFAs recursively
and combine.

1. $(\ )^* \approx$ 0 or more
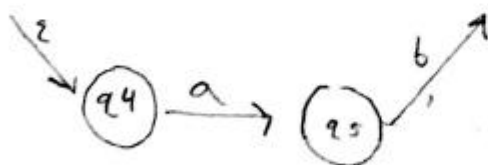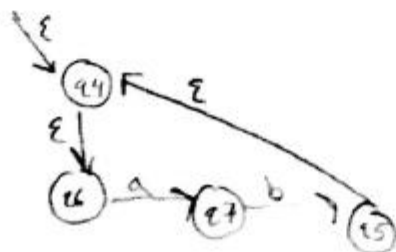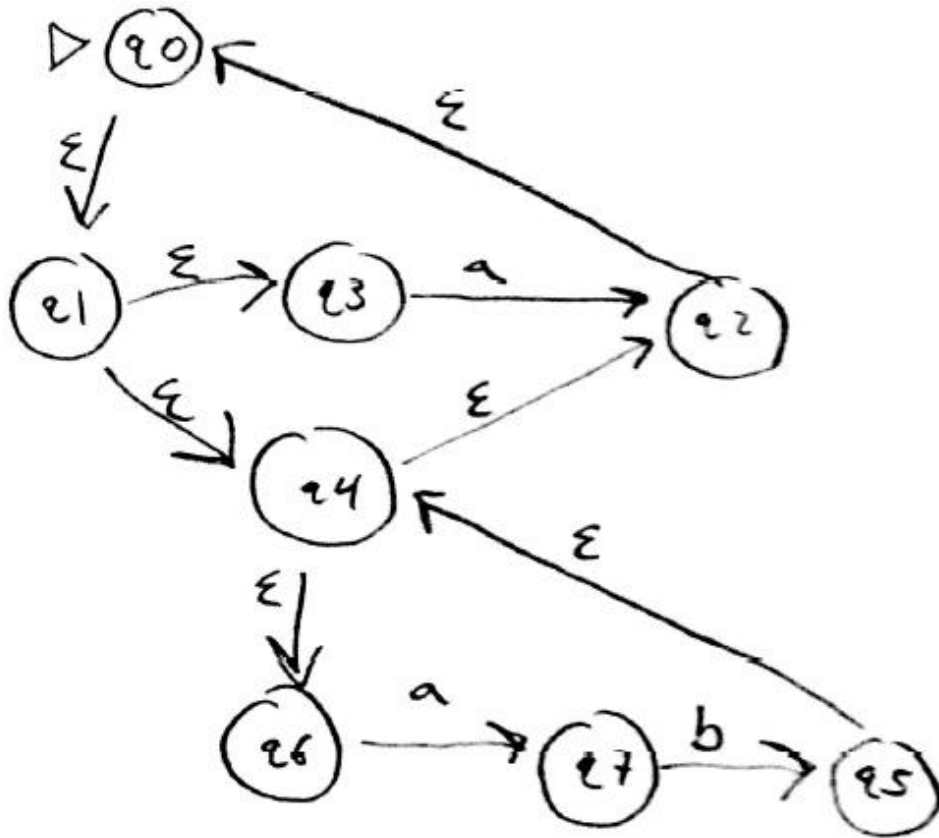


2. 0 or more $(a+b)$



3.

a b



3.5   0 or more   a b

## 4. Combine

▷ (q0)

q0 --ε--> q1

q1 --ε--> q3

q3 --a--> q2

q2 --ε--> q0

q1 --ε--> q4

q4 --ε--> q2

q4 --ε--> q6

q6 --a--> q7

q7 --b--> q5

q5 --ε--> q4

(c) (next page)

$(0|1)^* (00|11) (0|1)^*$

1.

$0|1$

$\rightarrow \bowtie \bigcirc \xrightarrow{\varepsilon} (A) \xrightarrow{0} (B) \xrightarrow{0}$

$(A) \xrightarrow{1}$

$(C) \xrightarrow{1} \rightarrow ((L)) \circlearrowright_1^0$

2.

$\rightarrow \bigcirc \xrightarrow{\varepsilon} \bigcirc \quad 0|1$

$\xrightarrow{00} \bigcirc$

$\xrightarrow{11} \quad (\bigcirc) \circlearrowright_1^0$

3. $\rightarrow \bigcirc \xrightarrow{0|1} \bigcirc \xrightarrow{00} (\bigcirc) \circlearrowright\, 0|1$

4. $\rightarrow \bowtie \bigcirc \xrightarrow{(01)^*(00|11)} ((\bigcirc)) \circlearrowright\, 0|1$

5. $\rightarrow \bowtie \bigcirc \underline{\quad (0|1)^* (00|11) (0|1)^* \quad} ((\bigcirc))$