Talal Sawaid

Ch 2.

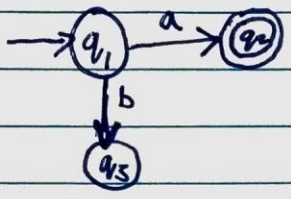
Sect 2.1

#1 Which of the strings are accepted by DFA in Fig 2.1?

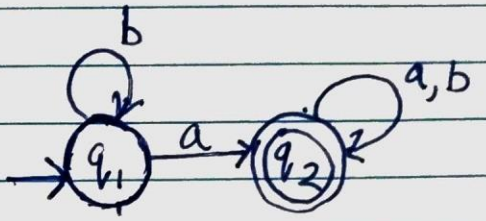
0001 - accepted
01001 - accepted
00100110 - not accepted

#2.

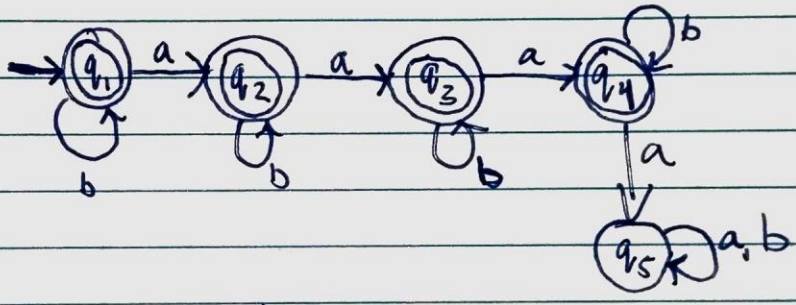
a.)



b.)

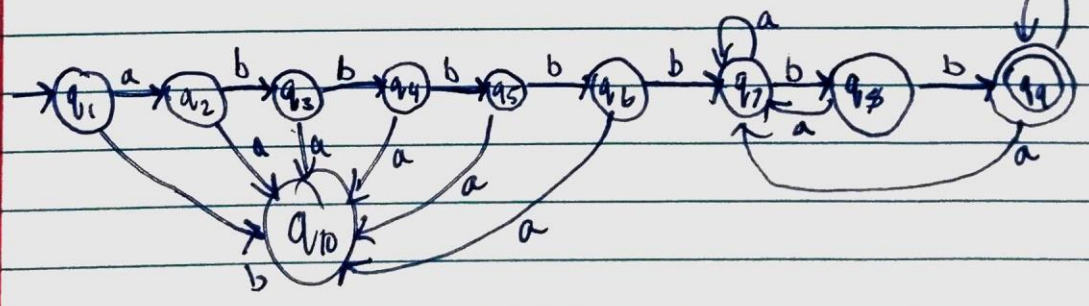


c.)

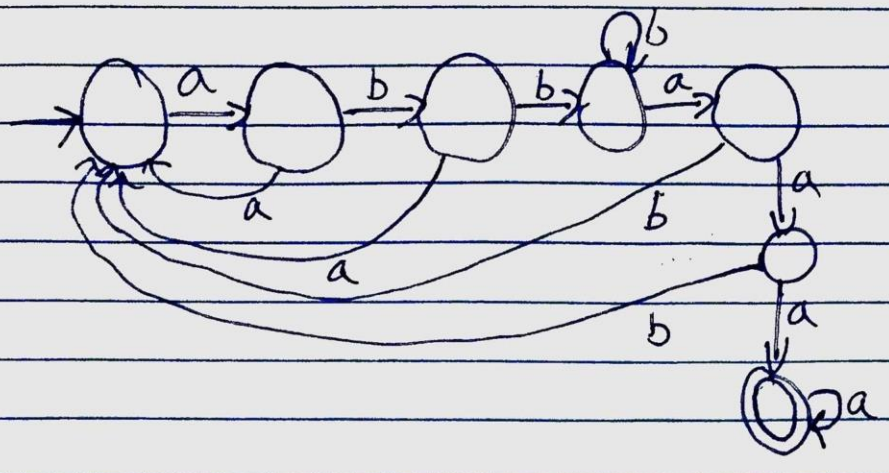


5. Give DFA's for languages

a.) $L = \{ab^5 wb^2 : w \in \{a,b\}^*\}$

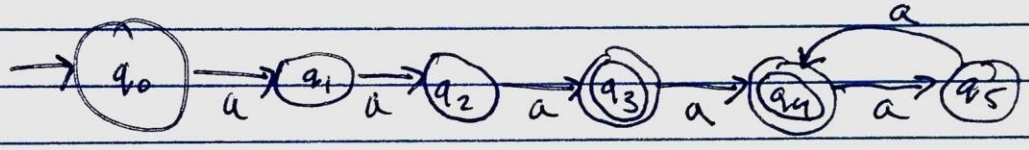


5. b) $L = \{ab^n a^m : n \geq 2, m \geq 3\}$

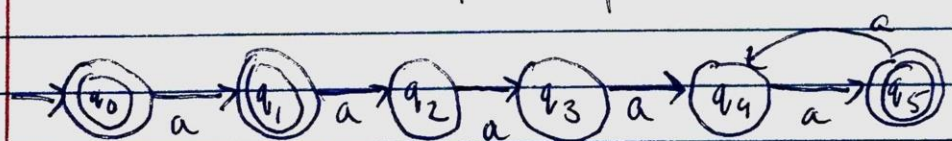


Sect 2.2

#2. Find DFA that accepts language defined by NFA either 3 a's or even # of a's in Fig 2.8



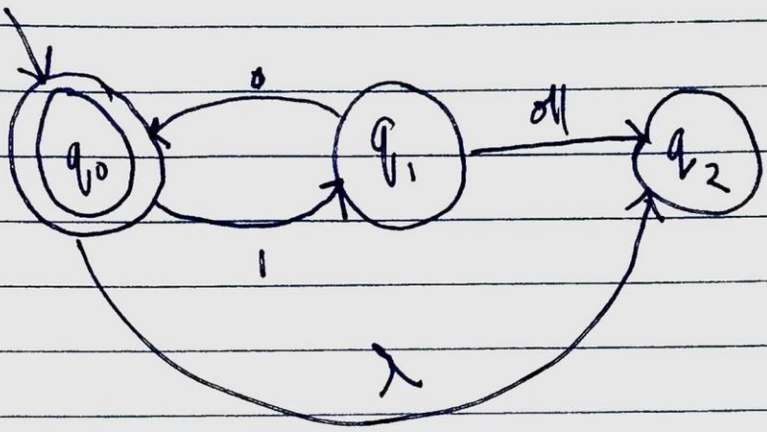
#3 Find DFA that accepts complement of the language in 2.8



For NFA in fig. 2.9 find $\delta^*(q_0, 1010)$ and $\delta^*(q_1, 00)$

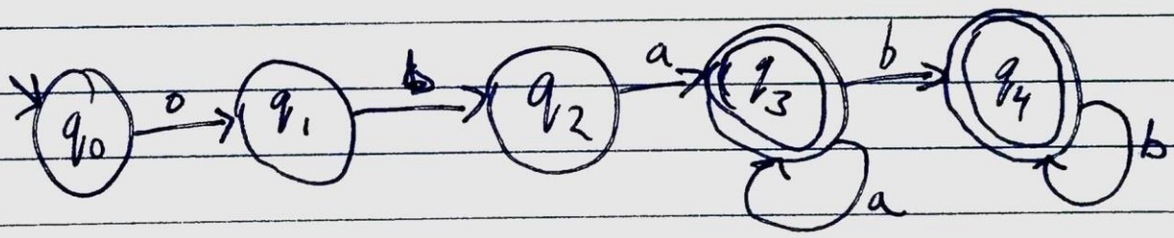
$\delta^*(q_0, 1010) = \{q_0, q_1, q_2\}$

$\delta^*(q_1, 00) = \emptyset$

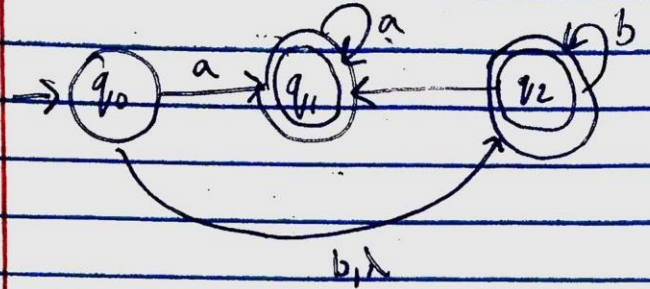


Design NFA w/ ≤ 5 states for the set

$\{abab^n : n > 0\} \cup \{aba^n : n \geq 0\}$

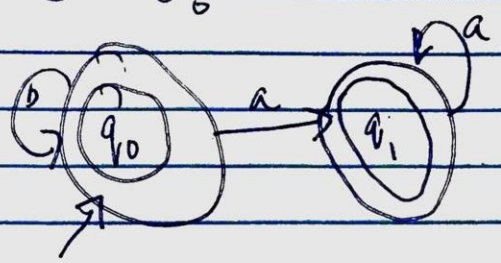


10 (a) Find an NFA w/ 3 states that accepts the language:
$L = \{a^n : n \geq 1\} \cup \{b^m a^k : m \geq 0, k \geq 0\}$



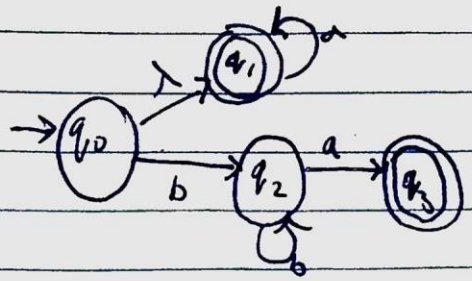
RE = $\underbrace{aa^*}_{RE_1} + \underbrace{b^*a^*}_{RE_2}$

b) < 3 states?

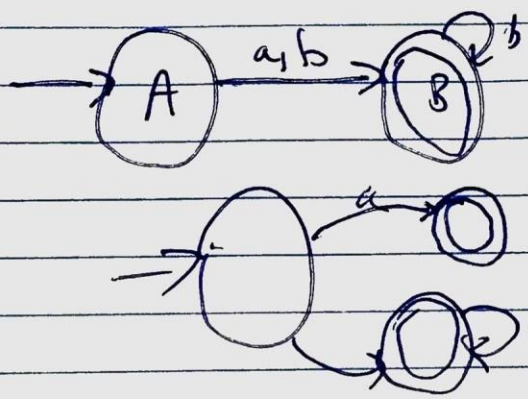


Yes

11 Find an nfa w/ four states for $L = \{a^n : n \geq 0\} \cup \{b^n a : n \geq 1\}$



2.3 #8 Find an NFA w/o λ-transitions ; w/ a single final state that accepts the set $\{a\} \cup \{b^n : n > 1\}$



RE: $a + bb^*$

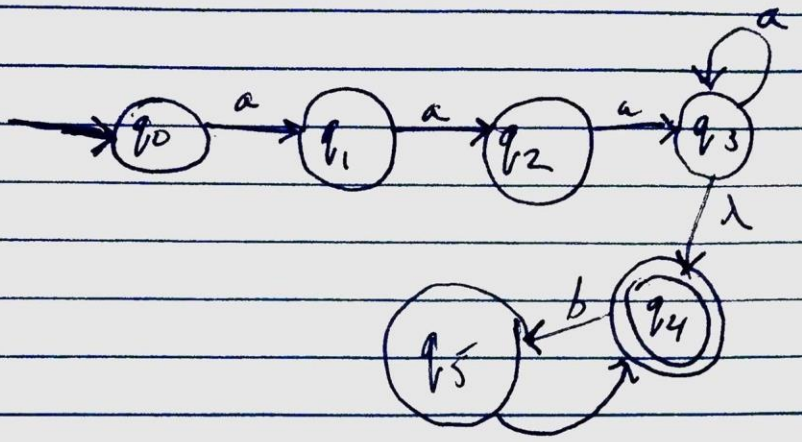
3.1 #1 Find all strings of less than four in

$$L((a+b)^*b(a+ab)^*)$$

1 b
2 ab, bb, ba
3 aba, aab, bba, bbb, baa, bab, abb

#4 Find a regex for $\{a^n b^m : n \geq 3, m \text{ is even}\}$

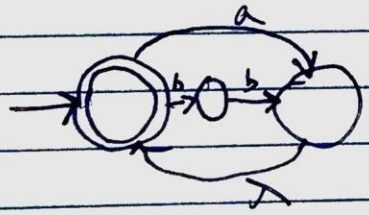
$aaaa^* (bb)^*$



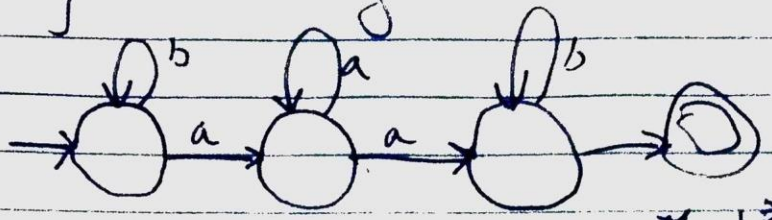
#5 Find a reg ex for the set $\{a^n b^m : (n+m) \text{ is even}\}$

$[(aa)^*(bb)^* + (aa)^* a(bb)^* b]$

3.2 #3 Give an nfa that accepts the language $L((a+b)^* b(a+bb)^*)$



10(a)i. Find the reg ex for the language accepted by the following automata



$RE = b^* a a^* a b^* a$

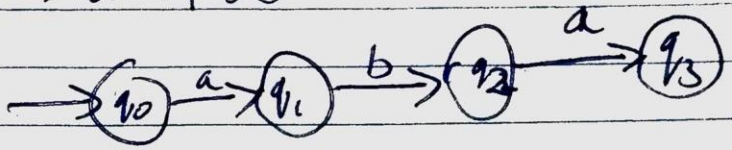
3.3

1

$S \rightarrow abA$

$A \rightarrow baB$

$B \rightarrow aA \mid bb$



#2 Find regular grammar that generates the language

$L(aa^*(ab+a)^*)$

$S \rightarrow aS \mid aA$

$A \rightarrow abA \mid aA \mid A$