
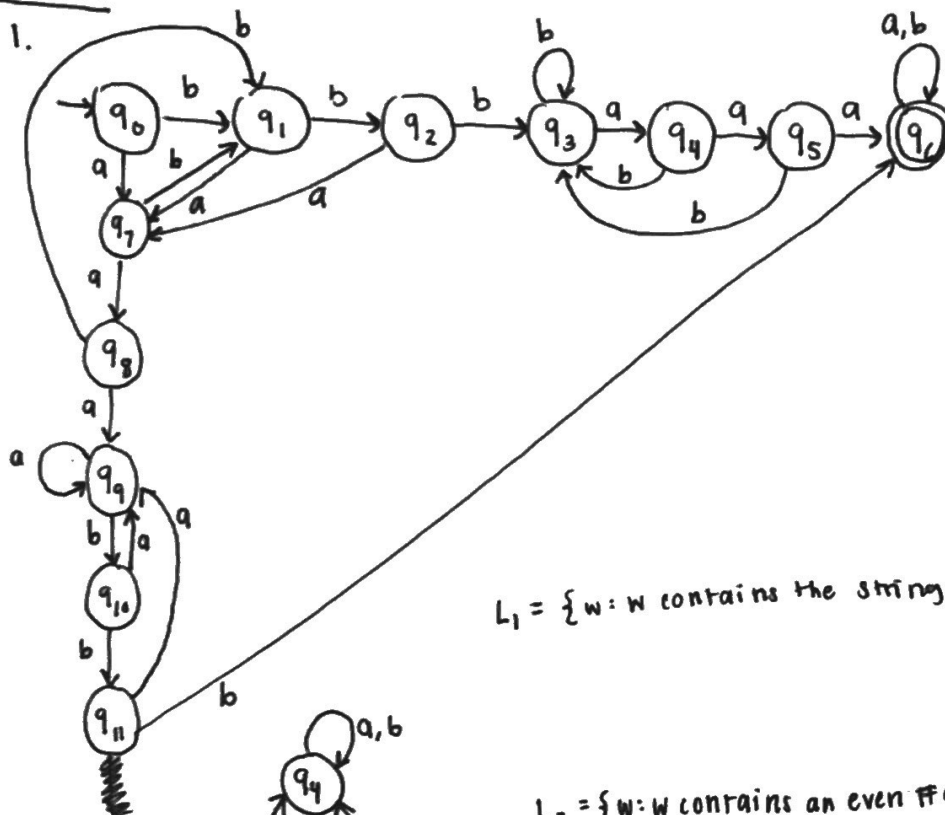


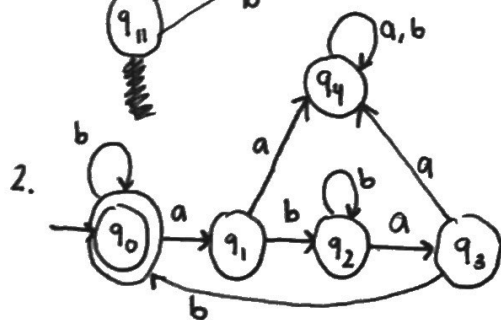
CS 334 PROBLEM SET 1

PROBLEM 1

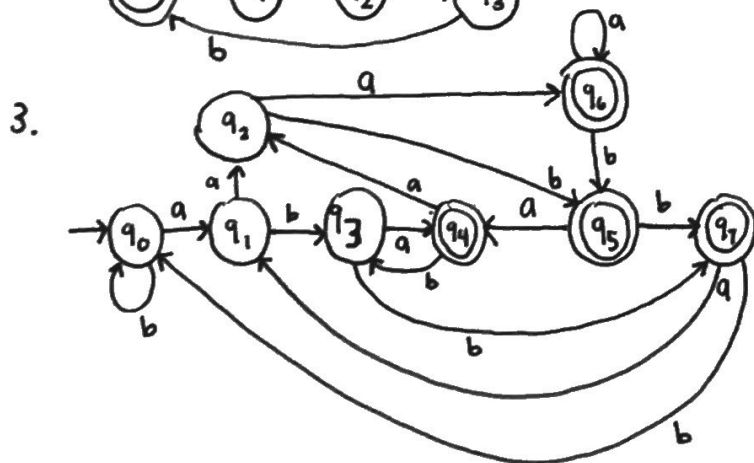
Constance "Connie" Xu
I pledge my honor that I
have abided by the Stevens
Honor system. 
Sept 6, 2019



$L_1 = \{w: w \text{ contains the string } aaa + \text{string } bbb\}$



$L_2 = \{w: w \text{ contains an even \# of } a\text{'s} + \text{each } a \text{ is followed by at least 1 } b\}$



$L_3 = \{w: \text{the 3rd last symbol of } w \text{ is an } a\}$

PROBLEM 2

let A, B be regular languages recognized by FSAs M_1 and M_2 .

let $M_1 = (Q_1, \Sigma_1, \delta_1, q_1, F_1)$ and $M_2 = (Q_2, \Sigma_2, \delta_2, q_2, F_2)$

Define a new FSA $M = (Q, \Sigma, \delta, q_0, F)$

$Q = Q_1 \times Q_2$

$\Sigma = \Sigma_1 \cup \Sigma_2$

$\delta(r_1, r_2, a) = \begin{cases} \text{case I: } (\delta_1(r_1, a), r_2) \\ \text{case II: } (r_1, \delta_2(r_2, a)) \\ \text{case III: } (\delta_1(r_1, a), \delta_2(r_2, a)) \end{cases}$

$q_0 = (q_1, q_2)$

$F = (F_1 \times Q_2) \cup (Q_1 \times F_2)$

... You can prove this by induction