TAREA ACEPTADORES FINITOS DETERMINISTAS (DFA)

Centro de Ciencias Básicas

Computación Inteligente

Autómatas I

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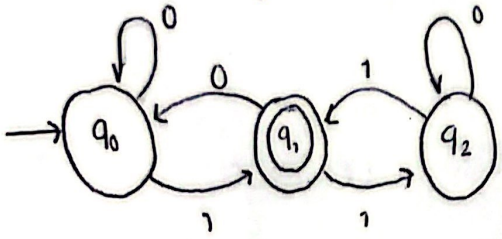
ACEPTADORES FINITOS DETERMINISTAS

① Which of the strings 0001, 01001, 0000110 are accepted by the dfa in figure 2.1?



Cadena 0001

$q_0 \xrightarrow{0} q_0 \xrightarrow{0} q_0 \xrightarrow{0} q_1 \xrightarrow{1}$ = Aceptado (estado final)

Cadena 01001

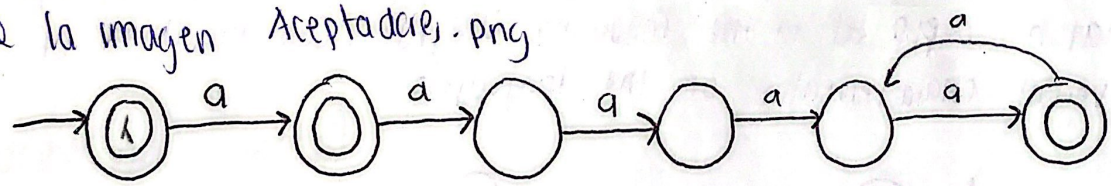
$q_0 \xrightarrow{0} q_1 \xrightarrow{1} q_0 \xrightarrow{0} q_0 \xrightarrow{0} q_1 \xrightarrow{1}$ = Aceptado (Edo. final)

Cadena 0000110

$q_0 \xrightarrow{0} q_0 \xrightarrow{0} q_0 \xrightarrow{0} q_0 \xrightarrow{1} q_1 \xrightarrow{1} q_2 \xrightarrow{0} q_2$ = Rechazado (No es estado final)

② Expresar con notación de conjunto los lenguajes aceptados por los DFA de la imagen Aceptadores.png

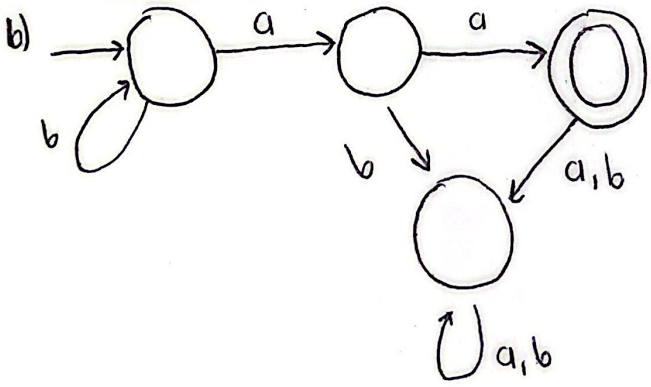
a)



Cadenas aceptadas: $\{\lambda, a, aaaaa, aaaaaaa, \}$

$L(a) = \{\lambda, a, a^n ; n \text{ es impar} \geq 5\}$

b)

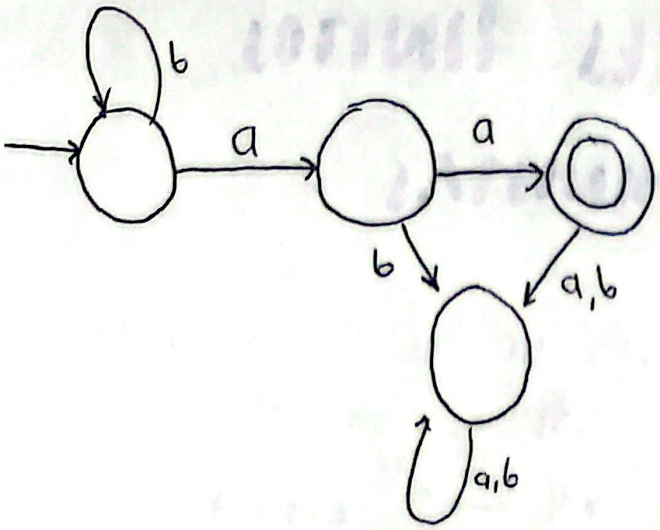


Cadenas aceptadas

$= \{aa, baa, bbbbaa, bbbbbbaa, \}$

$L(b) = \{b^n a^x ; n \geq 0 \text{ y } x = 2\}$

b)

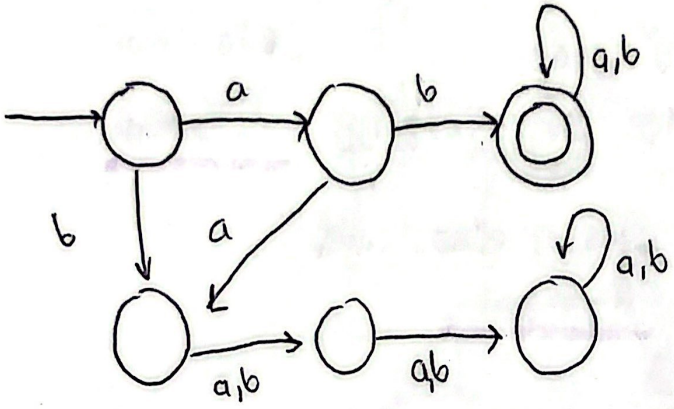


Cadena, aceptada,

$= \{baa, bbaa, bbbaa\}$

$L(b) = \{b^n a^2 ; n \geq 0\}$

c)

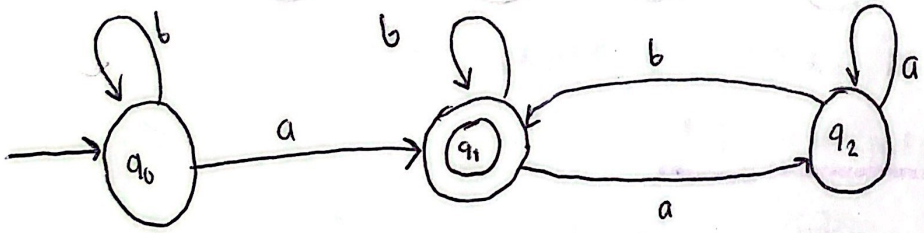


Cadena, aceptada,

$= \{aba, abb, abaa, abbb, \ldots\}$

$L(c) = \{abw ; w \in \{a,b\}^*\}$

(3) Give a set notation description of the language accepted by the automaton depicted in the following diagram. Can you think of a simple verbal characterization of the language?



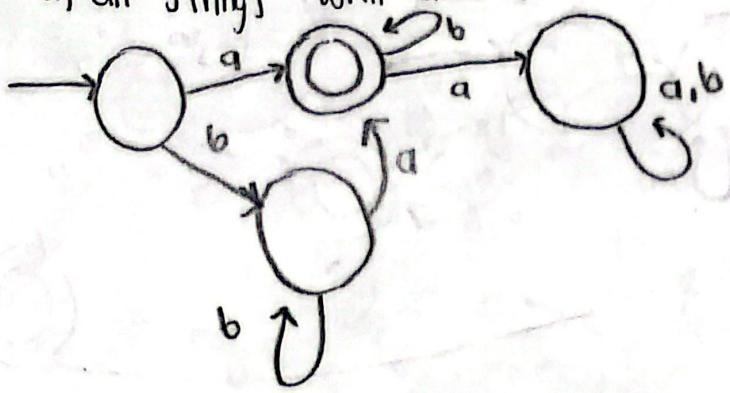
Cadena, aceptada,

$= \{a, ba, ab, bab, aaab\}$

$L = \{b^n a^x w b ; n \geq 0, x \geq 1, w \in \{a,b\}^*\}$

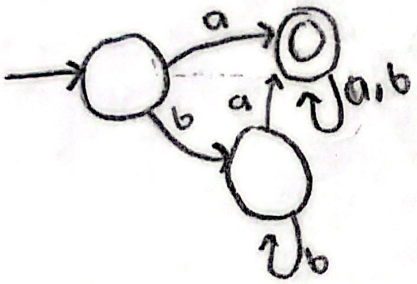
(4) For $\Sigma = \{a, b\}$, construct dfa's that accept the sets consisting of

a) all strings with exactly one a,



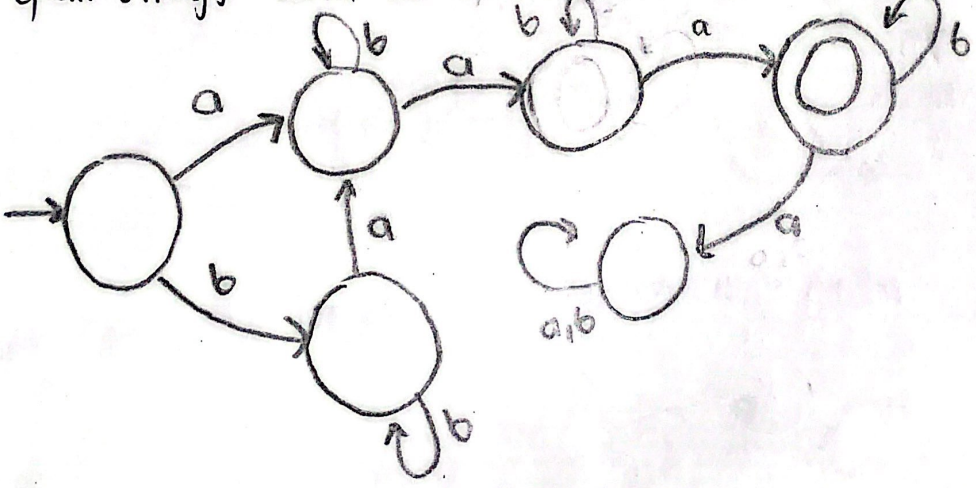
Cadenas aceptadas
= {a, ab, ba, abbb, }

b) all strings with at least one a,

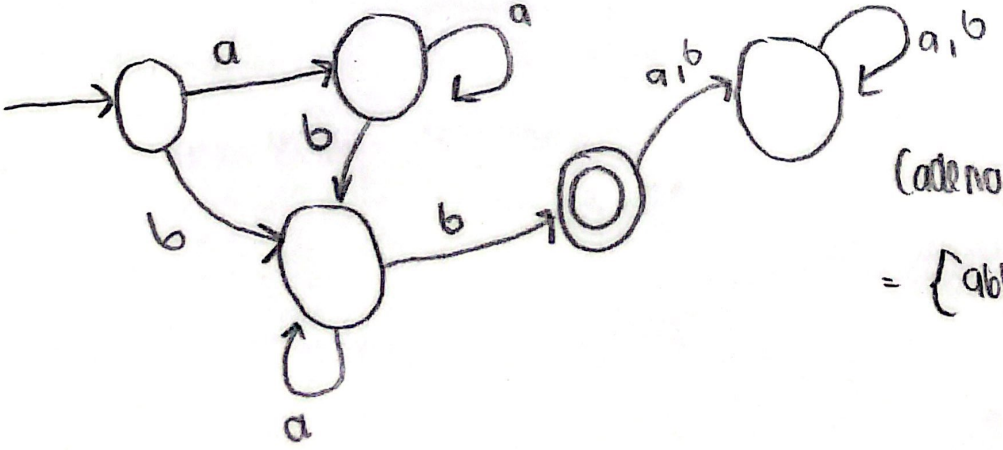


Cadenas aceptadas
= {a, aa, aad, ab, aba, abba, ...}

c) all strings with no more than three a's

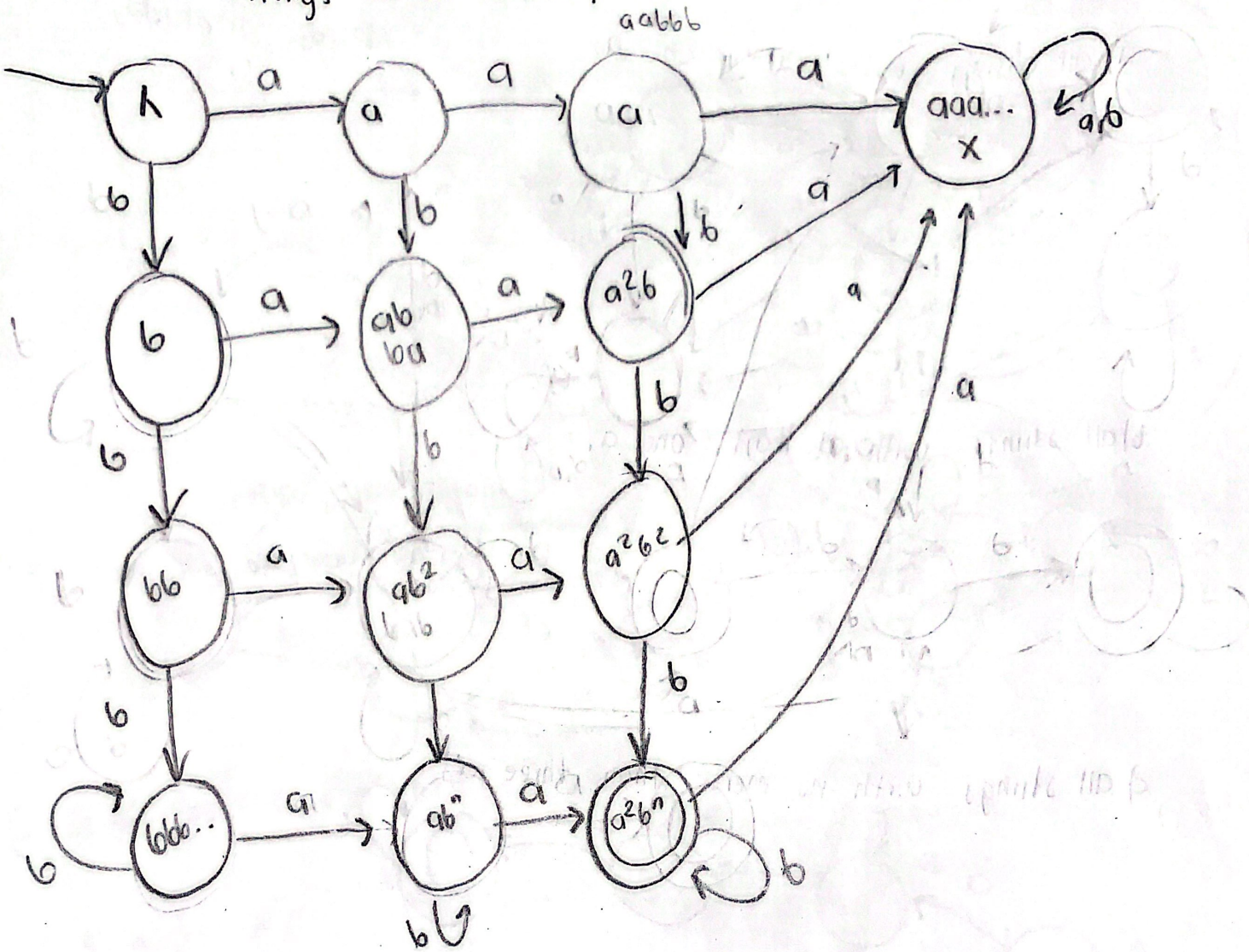


d) all strings with at least one a and exactly two b's



Cadenas aceptadas
= {abb, aabb, aaabb, bb, bab, }

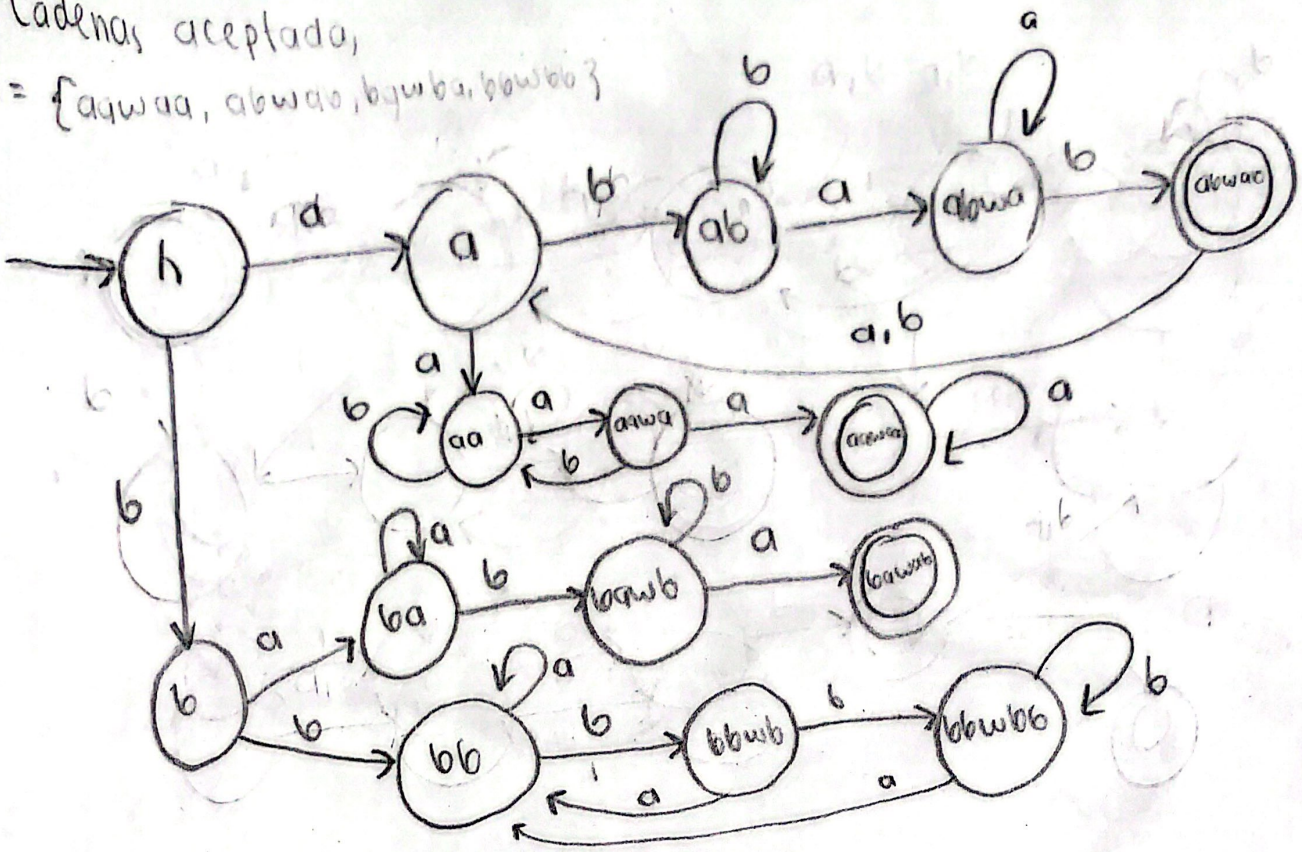
e) all the strings with exactly two a's and more than two b's



(5) Show that the language $L = \{vwv : v, w \in \{a,b\}^*, |v| = 2\}$ is regular

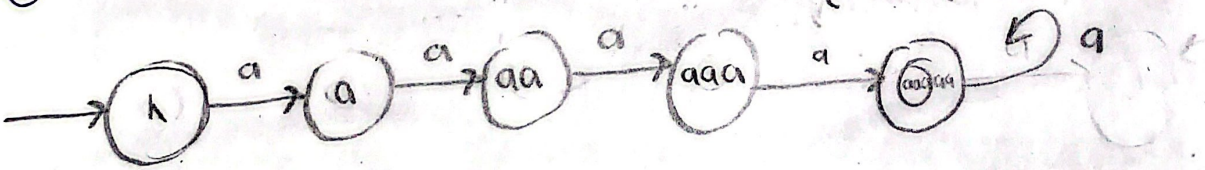
Cadenas aceptadas,

= {aawaa, abwab, bawba, bbwbb}

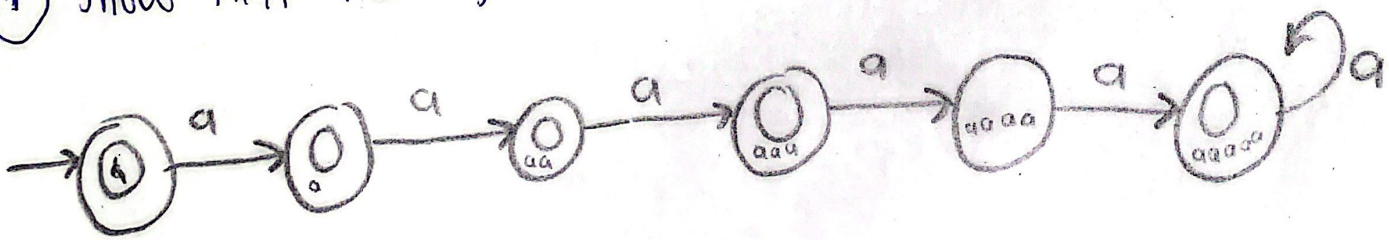


(6) Show that $L = \{a^n : n \geq 4\}$ is regular Cadena aceptada

= {aaaa, aaaaa, ...}



(7) Show that the language $L = \{a^n : n \geq 0, n \neq 4\}$ is regular



Cadena aceptada:

= {h, a, aa, aaa, aaaaa, aaaaaa... }