Determinización

a. $M_1 = \langle \{q_0, q_1, q_2, q_3\}, \{a, b\}, \delta_1, q_0, \{q_3\} \rangle$

$$\delta_1 = \begin{array}{c|c|c|c} & a & b & \lambda \\ \hline q_0 & \{q_0, q_1\} & \{q_0\} & \varnothing \\ q_1 & \{q_2\} & \{q_0\} & \varnothing \\ q_2 & \{q_3\} & \{q_0\} & \varnothing \\ q_3 & \{q_3\} & \{q_3\} & \varnothing \end{array}$$

Notación: llamamos los estados $0 \equiv q_0$, $1 \equiv q_1$, $2 \equiv q_2$, $3 \equiv q_3$

Construimos M AFD tq $L(M) = L(M_1)$

$M = (Q, \Sigma, \delta, M_{q_0}, F)$ $\quad Q \subseteq \mathcal{P}(\{0,1,2,3\})$ $\quad \Sigma = \{a, b\}$ $\quad M_{q_0} = \{0\}$

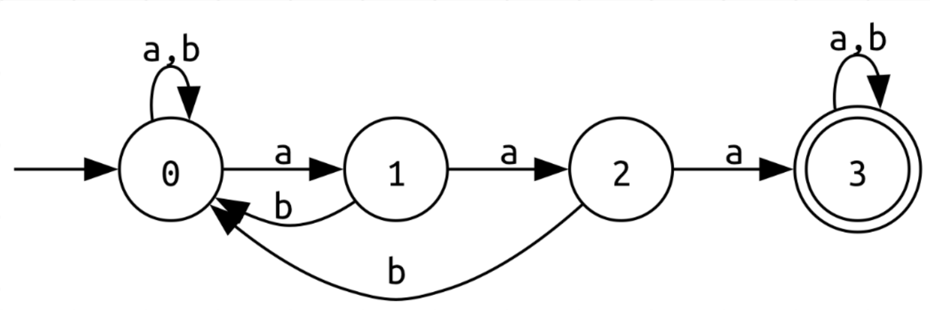
Aplicamos el algoritmo de determinización para definir $\delta : Q \to Q$ al mismo tiempo que encontramos los nuevos estados en Q.

δ	a	b
$\{0\}$	$\{0,1\}$	$\{0\}$
$\{0,1\}$	$\{0,1\} \cup \{2\} = \{0,1,2\}$	$\{0\} \cup \{0\} = \{0\}$
$\{0,1,2\}$	$\{0,1\} \cup \{2\} \cup \{3\} = \{0,1,2,3\}$	$\{0\} \cup \{0\} \cup \{0\} = \{0\}$
$\{0,1,2,3\}$	$\{0,1\} \cup \{2\} \cup \{3\} \cup \{3\} = \{0,1,2,3\}$	$\{0\} \cup \{0\} \cup \{0\} \cup \{3\} = \{0,3\}$
$\{0,3\}$	$\{0,1\} \cup \{3\} = \{0,1,3\}$	$\{0\} \cup \{3\} = \{0,3\}$
$\{0,1,3\}$	$\{0,1\} \cup \{2\} \cup \{3\} = \{0,1,2,3\}$	$\{0\} \cup \{0\} \cup \{3\} = \{0,3\}$

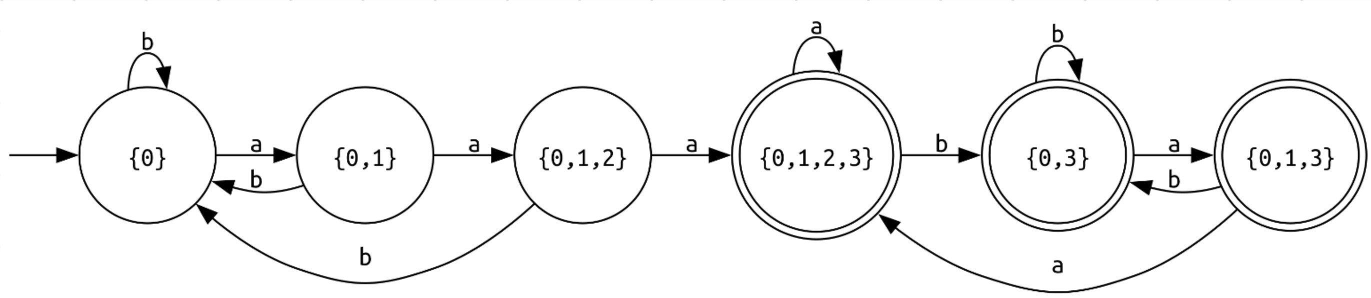
$Q = \{ \{0\}, \{0,1\}, \{0,1,2\}, \{0,1,2,3\}, \{0,3\}, \{0,1,3\} \}$

$F = \{ q \in Q : q \cap \{3\} \neq \varnothing \} = \{ \{0,1,2,3\}, \{0,3\}, \{0,1,3\} \}$

M_1 AFND



M AFD



Acepta: aaa aaaba abbaabaaaaa

Rechaza: λ bba aabbb

Minimización

Estados	$\equiv_0$	a	b	$\equiv_1$	a	b	$\equiv_2$	a	b	$\equiv_3$
$\{0\}$	NF	NF	NF	○	○	○	1	2	1	A
$\{0,1\}$	NF	NF	NF	○	△	○	2	3	1	B
$\{0,1,2\}$	NF	F	NF	△	□	○	3	4	1	C
$\{0,1,2,3\}$	F	F	F	□	□	□	4	4	4	D
$\{0,3\}$	F	F	F	□	□	□	4	4	4	D
$\{0,1,3\}$	F	F	F	□	□	□	4	4	4	D

Terminamos porque $(\equiv_2) = (\equiv_3)$
Resultan 4 clases de equivalencia $\Rightarrow$ 4 estados

Sea M' AFD mínimo tq $L(M') = L(M)$
$M' = (\{A, B, C, D\}, \{a, b\}, \delta', A, \{D\})$

$\delta'(A, a) = B$ $\quad$ $\delta'(B, a) = C$ $\quad$ $\delta'(C, a) = D$ $\quad$ $\delta'(D, a) = D$
$\delta'(A, b) = A$ $\quad$ $\delta'(B, b) = A$ $\quad$ $\delta'(C, b) = A$ $\quad$ $\delta'(D, b) = D$