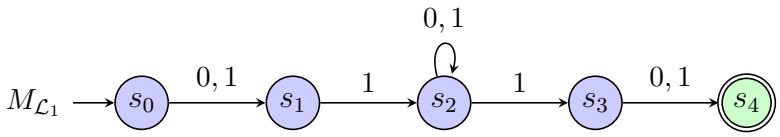
Expressões regulares:

$\mathcal{L}_1 = \{w \in \Sigma^* = \{0,1\}^* \mid |w| \geqslant 4$ e o segundo e o penúltimo símbolos de w são, ambos, $1\}$.

ER($\mathcal{L}_1$) : $(0 \cup 1)1(0 \cup 1)^*1(0 \cup 1)$.

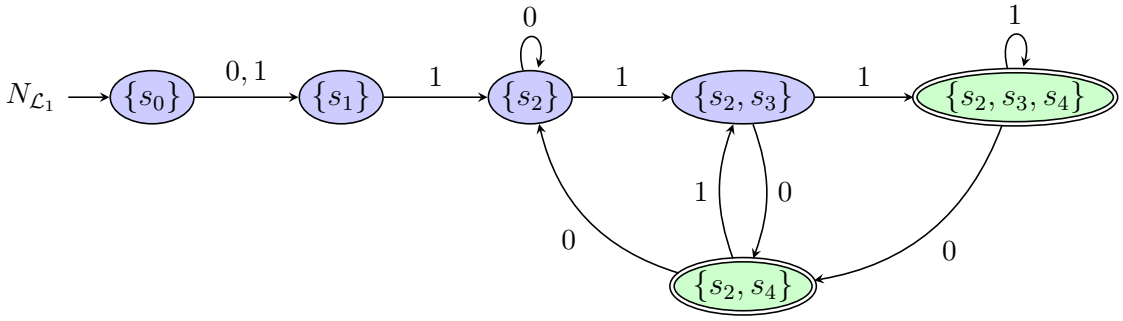
- NFA que reconhece a linguagem $\mathcal{L}_1$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_1\}$
s_1	$\varnothing$	$\{s_2\}$
s_2	$\{s_2\}$	$\{s_2, s_3\}$
s_3	$\{s_4\}$	$\{s_4\}$
s_4	$\varnothing$	$\varnothing$

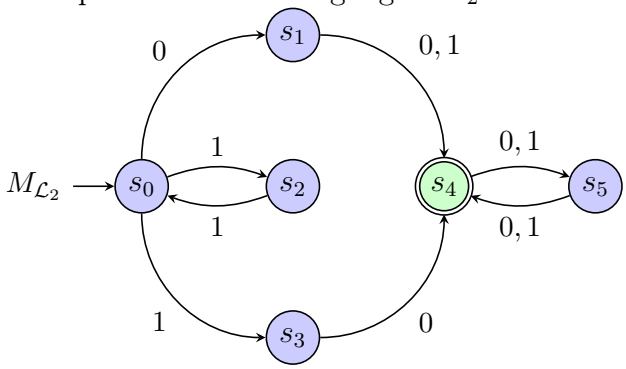
- DFA que reconhece a linguagem $\mathcal{L}_1$:



$\mathcal{L}_2 = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é par e w contém pelo menos um símbolo $0\}$.

ER($\mathcal{L}_2$) : $(11)^*(00 \cup 01 \cup 10)((0 \cup 1)(0 \cup 1))^*$.

- NFA que reconhece a linguagem $\mathcal{L}_2$:

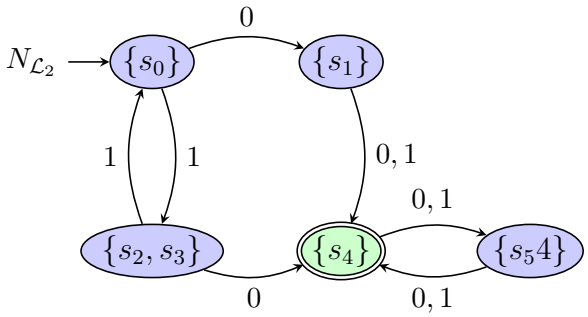


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_2, s_3\}$
s_1	$\{s_4\}$	$\{s_4\}$
s_2	$\varnothing$	$\{s_0\}$
s_3	$\{s_4\}$	$\varnothing$
s_4	$\{s_5\}$	$\{s_5\}$
s_5	$\{s_4\}$	$\{s_4\}$

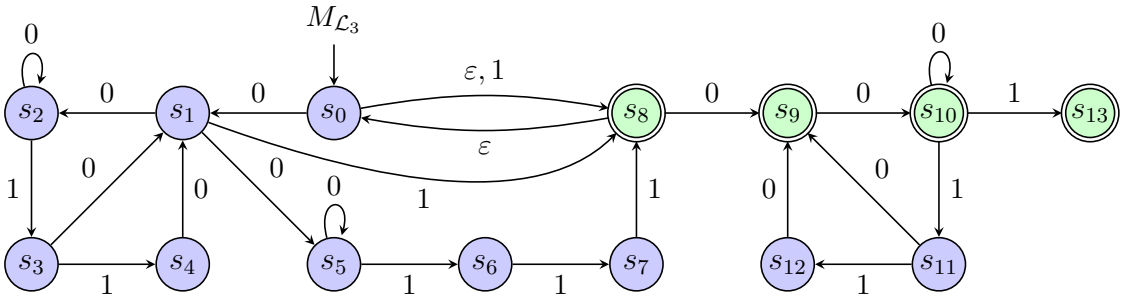
- DFA que reconhece a linguagem $\mathcal{L}_2$:



$\mathcal{L}_3 = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não termina com a subcadeia $0011\}$.

ER($\mathcal{L}_3$) : $(1 \cup 0(0^+1(0 \cup 10))^*(1 \cup 0^+111))^*(\varepsilon \cup 0(0^+1(0 \cup 10))^*(\varepsilon \cup 0^+ \cup 0^+1))$.

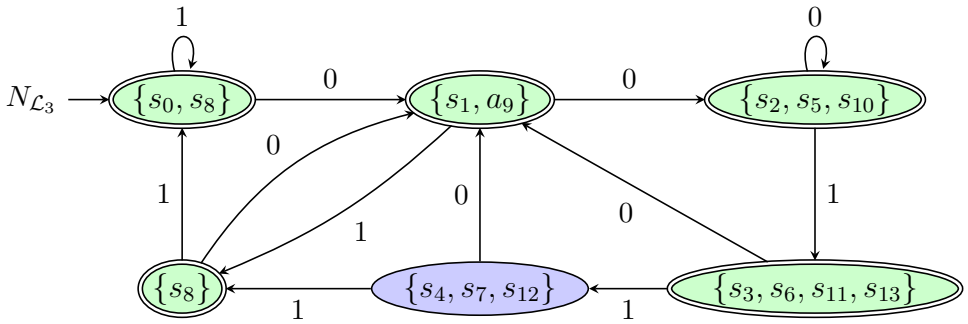
- NFA que reconhece a linguagem $\mathcal{L}_3$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_8\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1, s_9\}$	$\{s_0, s_8\}$
s_1	$\{s_2, s_5\}$	$\{s_8\}$
s_2	$\{s_2\}$	$\{s_3\}$
s_3	$\{s_1\}$	$\{s_4\}$
s_4	$\{s_1\}$	$\varnothing$
s_5	$\{s_5\}$	$\{s_6\}$
s_6	$\varnothing$	$\{s_7\}$
s_7	$\varnothing$	$\{s_8\}$
s_8	$\{s_1, s_9\}$	$\{s_0, s_8\}$
s_9	$\{s_{10}\}$	$\varnothing$
s_{10}	$\{s_{10}\}$	$\{s_{11}, s_{13}\}$
s_{11}	$\{s_9\}$	$\{s_{12}\}$
s_{12}	$\{s_9\}$	$\varnothing$
s_{13}	$\varnothing$	$\varnothing$

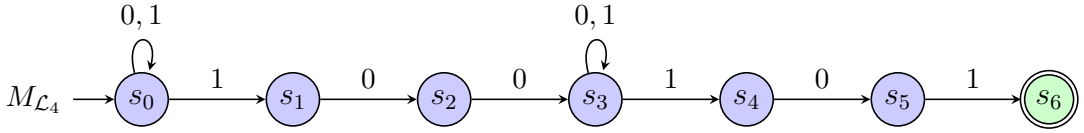
- DFA que reconhece a linguagem $\mathcal{L}_3$:



$\mathcal{L}_4 = \{w \in \Sigma^* = \{0,1\}^* \mid w$ termina com 101 e contém $100\}$.

ER($\mathcal{L}_4$) : $(0 \cup 1)^*100(0 \cup 1)^*101$.

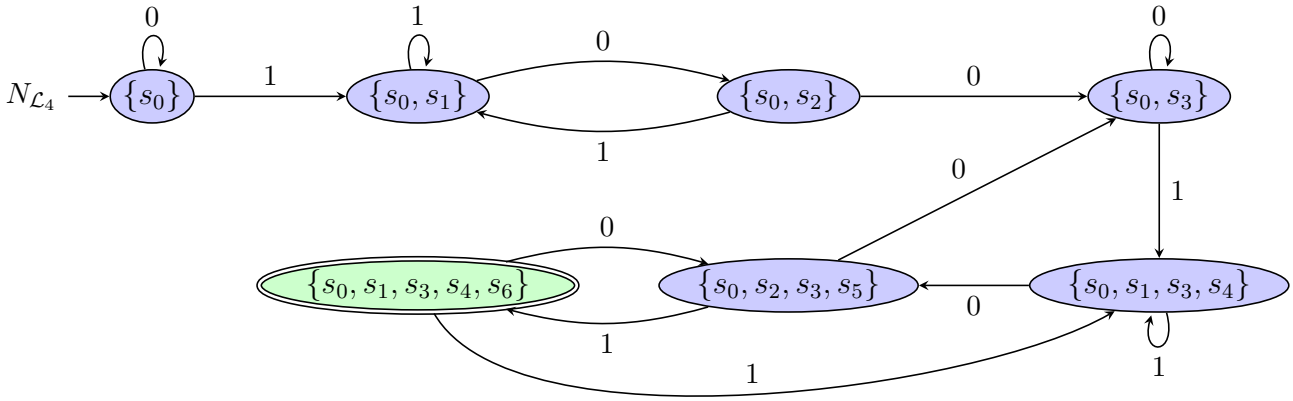
- NFA que reconhece a linguagem $\mathcal{L}_4$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_0\}$	$\{s_0, s_1\}$
s_1	$\{s_2\}$	$\varnothing$
s_2	$\{s_3\}$	$\varnothing$
s_3	$\{s_3\}$	$\{s_3, s_4\}$
s_4	$\{s_5\}$	$\varnothing$
s_5	$\varnothing$	$\{s_6\}$
s_6	$\varnothing$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_4$:



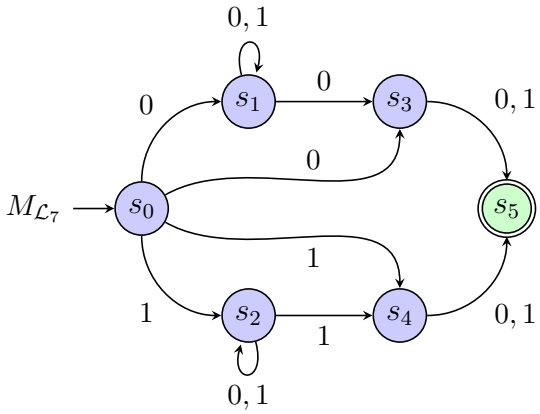
$\mathcal{L}_5 = \{w \in \Sigma^* = \{0,1\}^* \mid |w| \neq 2\}$.

$\mathcal{L}_6 = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não começa com 000 e não termina com $111\}$.

$\mathcal{L}_7 = \{w \in \Sigma^* = \{0,1\}^* \mid |w| > 0$ e o primeiro e o penúltimo símbolos de w são idênticos$\}$.

ER($\mathcal{L}_7$) : $(0 \cup 1)(0 \cup 1) \cup (0(0 \cup 1)^*0 \cup 1(0 \cup 1)^*1)(0 \cup 1)$.

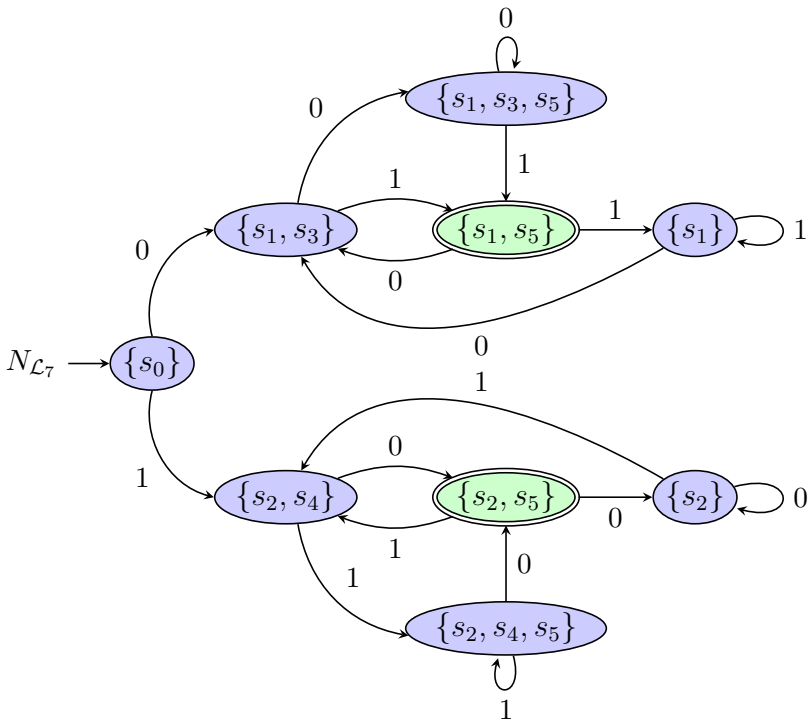
- NFA que reconhece a linguagem $\mathcal{L}_7$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1, s_3\}$	$\{s_2, s_4\}$
s_1	$\{s_1, s_3\}$	$\{s_1\}$
s_2	$\{s_2\}$	$\{s_2, s_4\}$
s_3	$\{s_5\}$	$\{s_5\}$
s_4	$\{s_5\}$	$\{s_5\}$
s_5	$\varnothing$	$\varnothing$

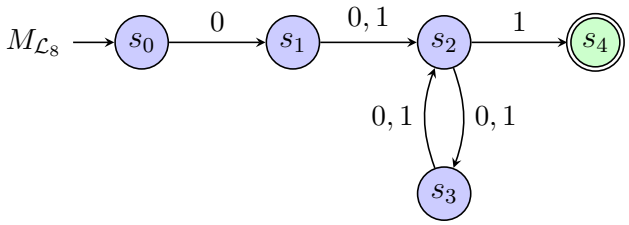
- DFA que reconhece a linguagem $\mathcal{L}_7$:



$\mathcal{L}_8 = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é ímpar e w começa com 0 e termina com $1\}$.

ER($\mathcal{L}_8$) : $0(0 \cup 1)((0 \cup 1)(0 \cup 1))^*1$.

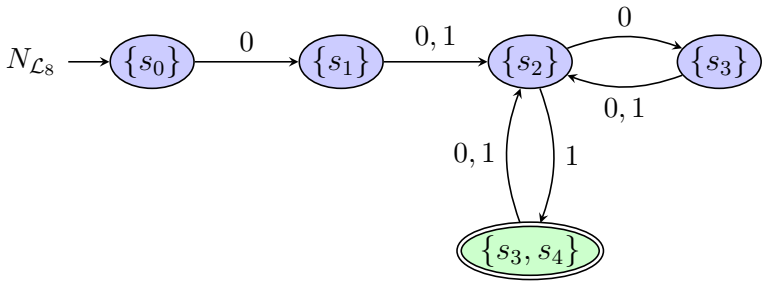
- NFA que reconhece a linguagem $\mathcal{L}_8$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\varnothing$
s_1	$\{s_2\}$	$\{s_2\}$
s_2	$\{s_3\}$	$\{s_3, s_4\}$
s_3	$\{s_2\}$	$\{s_2\}$
s_4	$\varnothing$	$\varnothing$

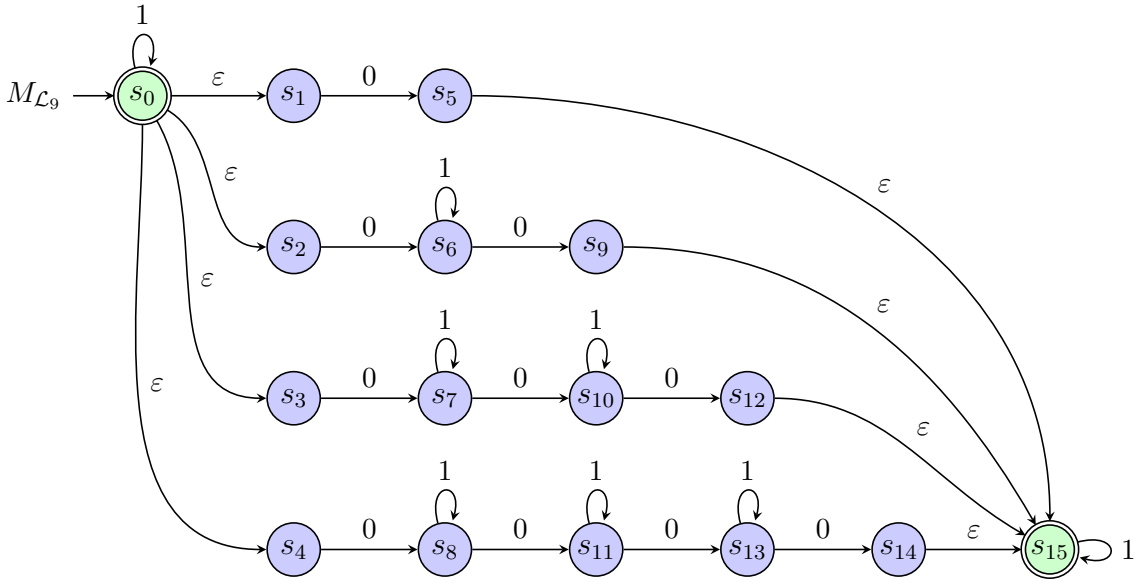
- DFA que reconhece a linguagem $\mathcal{L}_8$:



$\mathcal{L}_9 = \{w \in \Sigma^* = \{0,1\}^* \mid w$ contém no máximo 4 ocorrências do símbolo $0\}$.

ER($\mathcal{L}_9$) : $1^*(\varepsilon \cup 0 \cup 01^*0 \cup 01^*01^*0 \cup 01^*01^*01^*0)1^*$.

- NFA que reconhece a linguagem $\mathcal{L}_9$:

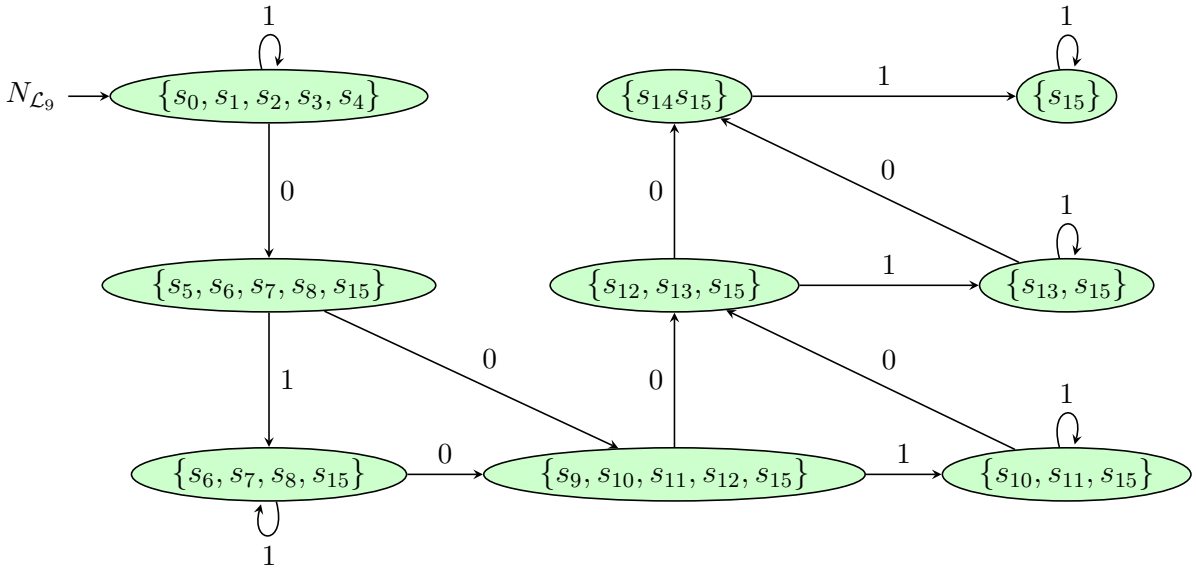


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_2, s_3, s_4\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_5, s_6, s_7, s_8\}$	$\{s_0, s_1, s_2, s_3, s_4\}$
s_1	$\{s_5, s_{15}\}$	$\varnothing$
s_2	$\{s_6\}$	$\varnothing$
s_3	$\{s_7\}$	$\varnothing$
s_4	$\{s_8\}$	$\varnothing$
s_5	$\varnothing$	$\{s_{15}\}$
s_6	$\{s_9, s_{15}\}$	$\{s_6\}$
s_7	$\{s_{10}\}$	$\{s_7\}$
s_8	$\{s_{11}\}$	$\{s_8\}$
s_9	$\varnothing$	$\{s_{15}\}$
s_{10}	$\{s_{12}, s_{15}\}$	$\{s_{10}\}$
s_{11}	$\{s_{13}\}$	$\{s_{11}\}$
s_{12}	$\varnothing$	$\{s_{15}\}$
s_{13}	$\{s_{14}, s_{15}\}$	$\{s_{13}\}$
s_{14}	$\varnothing$	$\{s_{15}\}$
s_{15}	$\varnothing$	$\{s_{15}\}$

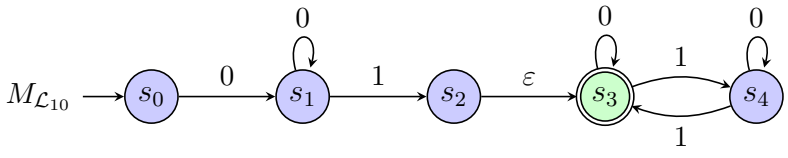
- DFA que reconhece a linguagem $\mathcal{L}_9$:



$\mathcal{L}_{10} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ começa com 0 e contém quantidade ímpar de 1's$\}$.

ER($\mathcal{L}_{10}$) : $0^+1(0 \cup 10^*1)^*$.

- NFA que reconhece a linguagem $\mathcal{L}_{10}$:

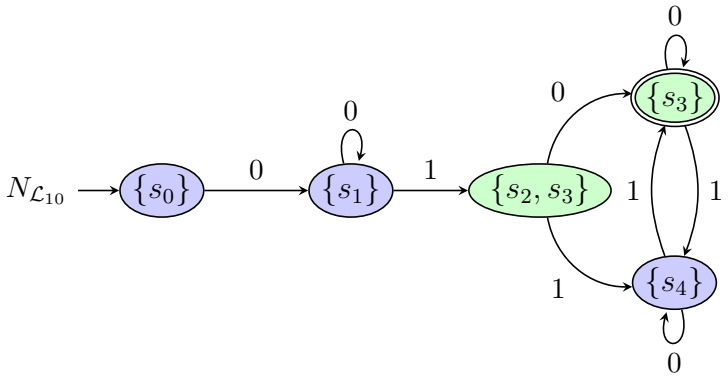


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\varnothing$
s_1	$\{s_1\}$	$\{s_2, s_3\}$
s_2	$\{s_3\}$	$\{s_4\}$
s_3	$\{s_3\}$	$\{s_4\}$
s_4	$\{s_4\}$	$\{s_3\}$

- DFA que reconhece a linguagem $\mathcal{L}_{10}$:

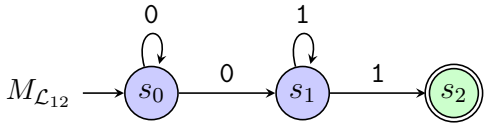


$\mathcal{L}_{11} = \{w \in \Sigma^* = \{0,1\}^* \mid$ todo símbolo 0 em w é seguido de pelo menos dois 1's consecutivos, exceto a última ocorrência de 0 em $w\}$.

$\mathcal{L}_{12} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ começa com 0, não contém 10 e termina com $1\}$.

ER($\mathcal{L}_{12}$) : 0^+1^+.

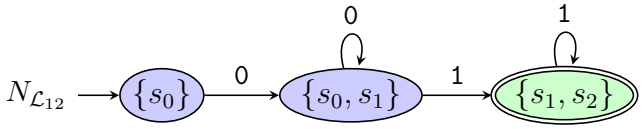
- NFA que reconhece a linguagem $\mathcal{L}_{12}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_0, s_1\}$	$\varnothing$
s_1	$\varnothing$	$\{s_1, s_2\}$
s_2	$\varnothing$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{12}$:

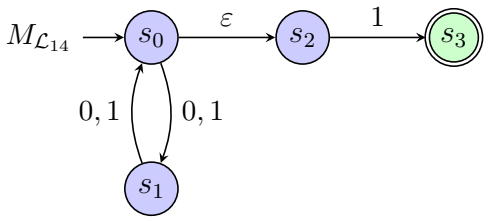


$\mathcal{L}_{13} = \{w \in \Sigma^* = \{0,1\}^* \mid w = xyz$ e $|x| = 2\}$.

$\mathcal{L}_{14} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é ímpar e w termina com $1\}$.

ER($\mathcal{L}_{14}$) : $((0 \cup 1)(0 \cup 1))^*1$.

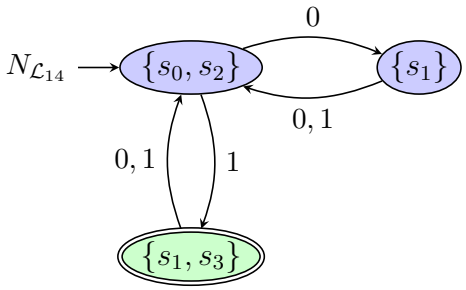
- NFA que reconhece a linguagem $\mathcal{L}_{14}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_2\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_1, s_3\}$
s_1	$\{s_1, s_2\}$	$\{s_0, s_2\}$
s_2	$\varnothing$	$\{s_3\}$
s_3	$\varnothing$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{14}$:



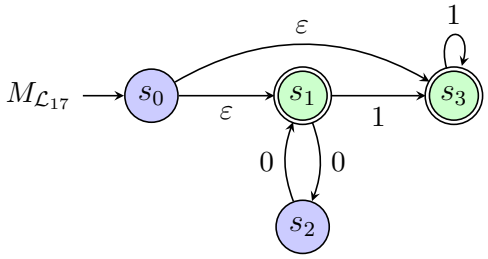
$\mathcal{L}_{15} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ contém quantidade par de 0's ou ímpar de 1's (ou ambos)$\}$.

$\mathcal{L}_{16} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ termina com um 0 seguido de uma quantidade ímpar de 1's$\}$.

$\mathcal{L}_{17} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_0$ é par e todos os 0's antecedem todos os 1's$\}$.

ER($\mathcal{L}_{17}$) : $(00)^*1^*$.

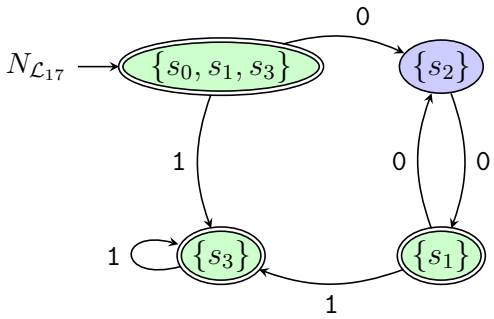
- NFA que reconhece a linguagem $\mathcal{L}_{17}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_3\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_2\}$	$\{s_3\}$
s_1	$\{s_2\}$	$\{s_3\}$
s_2	$\{s_1\}$	$\varnothing$
s_3	$\varnothing$	$\{s_3\}$

- DFA que reconhece a linguagem $\mathcal{L}_{17}$:

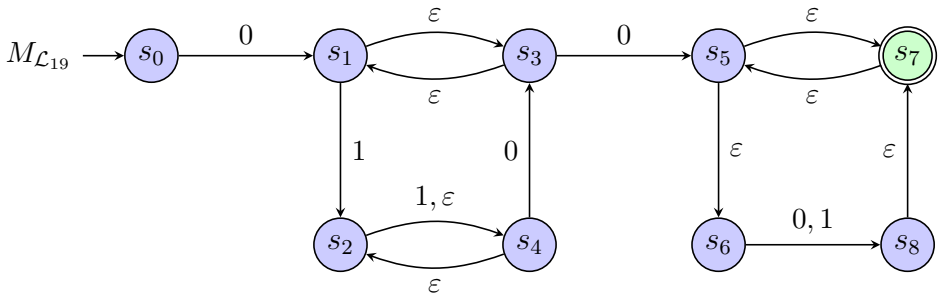


$\mathcal{L}_{18} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ contém quantidade par de 01's e ímpar de 0's$\}$.

$\mathcal{L}_{19} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ começa com 0 e contém 00$\}$.

ER($\mathcal{L}_{19}$) : $0(1^+0)^*0(0 \cup 1)^*$.

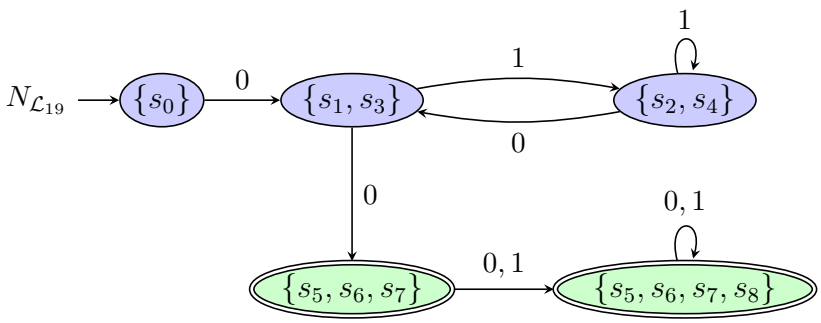
- NFA que reconhece a linguagem $\mathcal{L}_{19}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\varnothing$
s_1	$\{s_5, s_6, s_7\}$	$\{s_2, s_4\}$
s_2	$\{s_1, s_3\}$	$\{s_2, s_4\}$
s_3	$\{s_5, s_6, s_7\}$	$\{s_2, s_4\}$
s_4	$\{s_1, s_3\}$	$\{s_2, s_4\}$
s_5	$\{s_5, s_6, s7, s8\}$	$\{s_5, s_6, s7, s8\}$
s_6	$\{s_5, s_6, s7, s8\}$	$\{s_5, s_6, s7, s8\}$
s_7	$\{s_5, s_6, s7, s8\}$	$\{s_5, s_6, s7, s8\}$
s_8	$\{s_5, s_6, s7, s8\}$	$\{s_5, s_6, s7, s8\}$

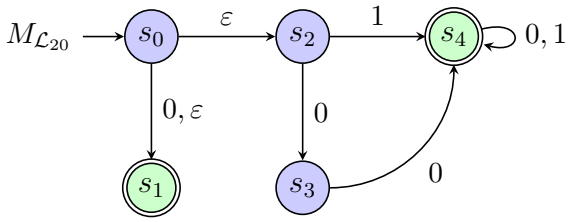
- DFA que reconhece a linguagem $\mathcal{L}_{19}$:



$\mathcal{L}_{20} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não contém 01 como prefixo$\}$.

ER($\mathcal{L}_{20}$) : $(\varepsilon \cup 0) \cup (00 \cup 1)(0 \cup 1)^*$.

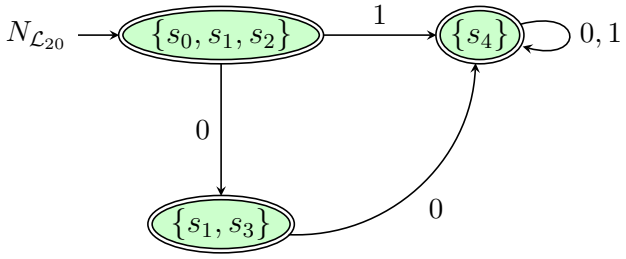
- NFA que reconhece a linguagem $\mathcal{L}_{20}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_2\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1, s_2\}$	$\{s_4\}$
s_1	$\varnothing$	$\varnothing$
s_2	$\{s_3\}$	$\{s_4\}$
s_3	$\{s_e\}$	$\varnothing$
s_4	$\{s_4\}$	$\{s_4\}$

- DFA que reconhece a linguagem $\mathcal{L}_{20}$:

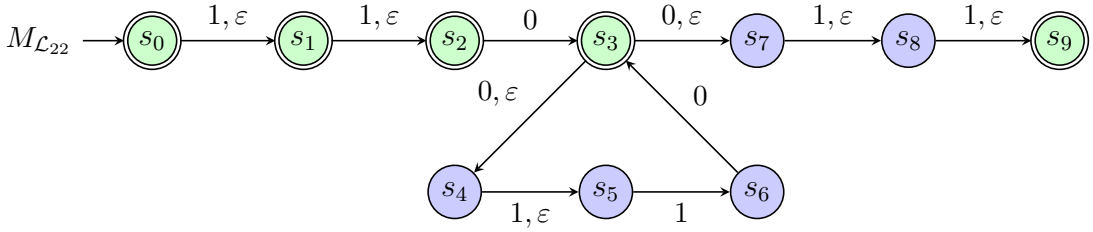


$\mathcal{L}_{21} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_1$ é par e w não contém a subcadeia $11\}$.

$\mathcal{L}_{22} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não contém três símbolos idênticos consecutivos$\}$.

ER($\mathcal{L}_{22}$) : $\varepsilon \cup 1 \cup 11 \cup (0 \cup 1(0 \cup 10))((1 \cup 01)(0 \cup 10))^*(\varepsilon \cup 0 \cup 1 \cup 01 \cup 11 \cup 011)$.

- NFA que reconhece a linguagem $\mathcal{L}_{22}$:

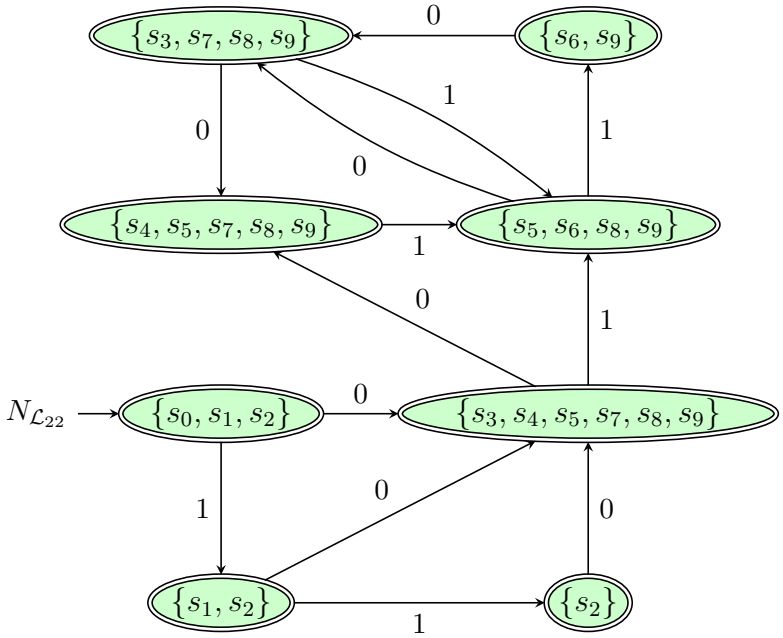


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_2\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_3, s_4, s_5, s_7, s_8, s_9\}$	$\{s_1, s_2\}$
s_1	$\{s_3, s_4, s_5, s_7, s_8, s_9\}$	$\{s_2\}$
s_2	$\{s_3, s_4, s_5, s_7, s_8, s_9\}$	$\varnothing$
s_3	$\{s_4, s_5, s_7, s_8, s_9\}$	$\{s_5, s_6, s_8, s_9\}$
s_4	$\varnothing$	$\{s_5, s_6\}$
s_5	$\varnothing$	$\{s_6\}$
s_6	$\{s_3, s_7, s_8, s_9\}$	$\varnothing$
s_7	$\varnothing$	$\{s_8, s_9\}$
s_8	$\varnothing$	$\{s_9\}$
s_9	$\varnothing$	$\varnothing$

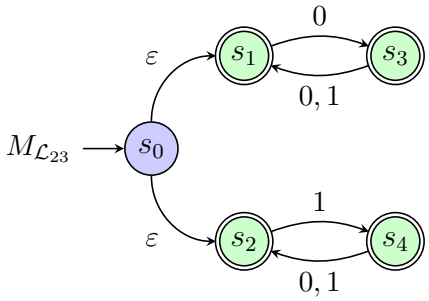
- DFA que reconhece a linguagem $\mathcal{L}_{22}$:



$\mathcal{L}_{23} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ contém o mesmo símbolo em todas as posições pares$\}$.

ER($\mathcal{L}_{23}$) : $(0(0 \cup 1))^*(\varepsilon \cup 0) \cup (1(0 \cup 1))^*(\varepsilon \cup 1)$.

- NFA que reconhece a linguagem $\mathcal{L}_{23}$:

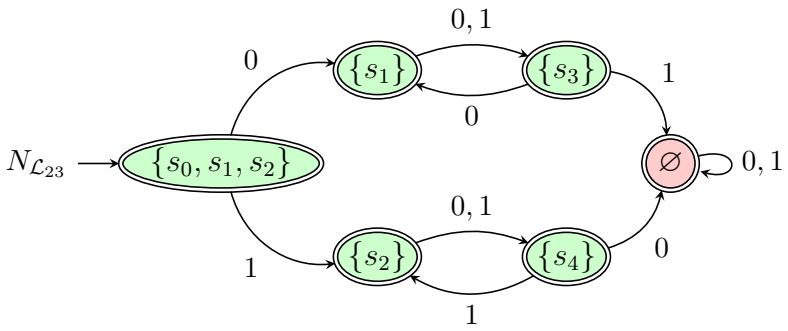


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_2\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_2\}$
s_1	$\{s_3\}$	$\varnothing$
s_2	$\varnothing$	$\{s_4\}$
s_3	$\{s_1\}$	$\{s_1\}$
s_4	$\{s_2\}$	$\{s_2\}$

- DFA que reconhece a linguagem $\mathcal{L}_{23}$:



$\mathcal{L}_{24} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_{01} = |w|_{10}\}$.

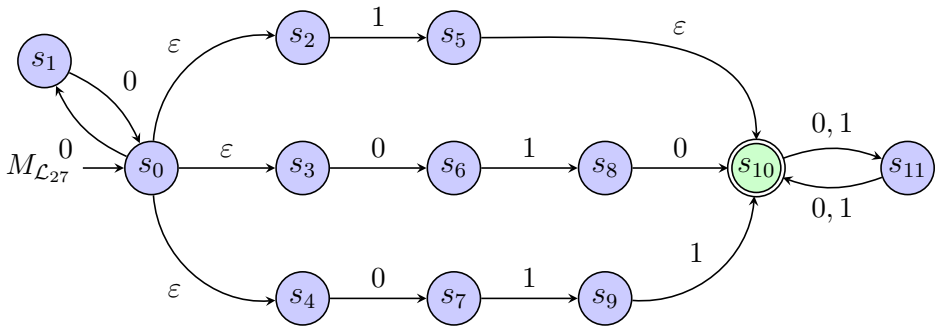
$\mathcal{L}_{25} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é múltiplo de $3\}$.

$\mathcal{L}_{26} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é uma sequência de subcadeias 01 ou $10\}$.

$\mathcal{L}_{27} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é ímpar e w contém pelo menos uma ocorrência do símbolo $1\}$.

ER($\mathcal{L}_{27}$) : $(00)^*(1 \cup 01(0 \cup 1))((0 \cup 1)(0 \cup 1))^*$.

- NFA que reconhece a linguagem $\mathcal{L}_{27}$:

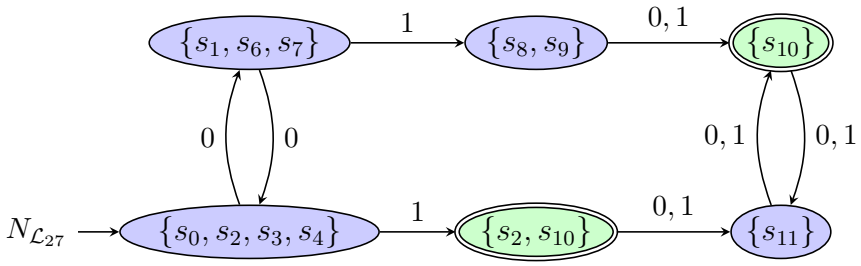


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_2, s_3, s_4\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_1, s_6, s_7\}$	$\{s_5\}$
s_1	$\{s_0\}$	$\varnothing$
s_2	$\varnothing$	$\{s_5, s_{10}\}$
s_3	$\{s_6\}$	$\varnothing$
s_4	$\{s_7\}$	$\varnothing$
s_5	$\{s_{11}\}$	$\{s_{11}\}$
s_6	$\varnothing$	$\{s_8\}$
s_7	$\varnothing$	$\{s_9\}$
s_8	$\{s_{10}\}$	$\varnothing$
s_9	$\varnothing$	$\{s_{10}\}$
s_{10}	$\{s_{11}\}$	$\{s_{11}\}$
s_{11}	$\{s_{10}\}$	$\{s_{10}\}$

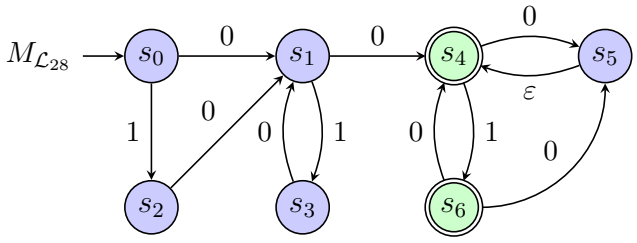
- DFA que reconhece a linguagem $\mathcal{L}_{27}$:



$\mathcal{L}_{28} = \{w \in \Sigma^* = \{0,1\}^* \mid w \text{ contém 00 e não contém 11}\}$.

ER($\mathcal{L}_{28}$) : $(0 \cup 10)(10)^*0(0 \cup 10)^*(\varepsilon \cup 1)$.

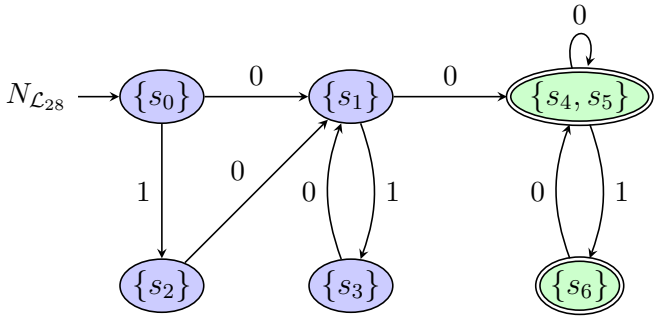
- NFA que reconhece a linguagem $\mathcal{L}_{28}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_2\}$
s_1	$\{s_4\}$	$\{s_3\}$
s_2	$\{s_1\}$	$\varnothing$
s_3	$\{s_1\}$	$\varnothing$
s_4	$\{s_4, s_5\}$	$\{s_6\}$
s_5	$\{s_4, s_5\}$	$\{s_6\}$
s_6	$\{s_4, s_5\}$	$\varnothing$

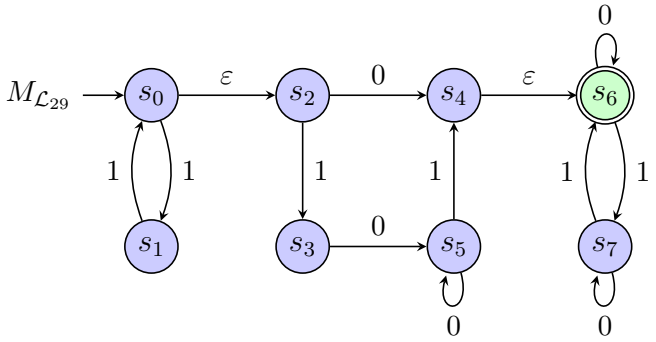
- DFA que reconhece a linguagem $\mathcal{L}_{28}$:



$\mathcal{L}_{29} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ contém pelo menos um 0 e contém quantidade par de 1's$\}$.

ER($\mathcal{L}_{29}$) : $(11)^*(0 \cup 10^+1)(0 \cup 10^*1)^*$.

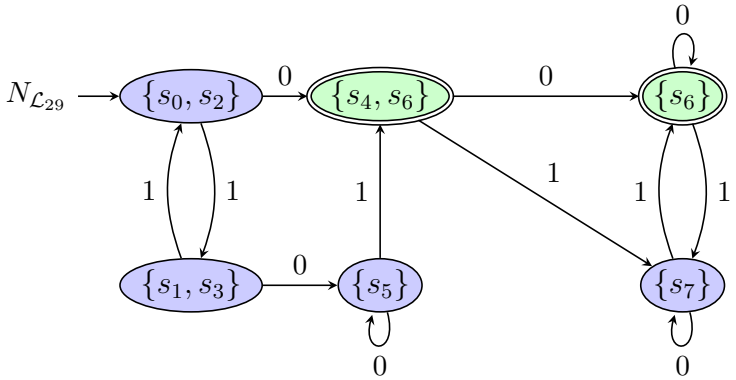
- NFA que reconhece a linguagem $\mathcal{L}_{29}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_2\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_4, s_6\}$	$\{s_1, s_3\}$
s_1	$\varnothing$	$\{s_0\}$
s_2	$\{s_4, s_6\}$	$\{s_3\}$
s_3	$\{s_5\}$	$\varnothing$
s_4	$\{s_6\}$	$\{s_7\}$
s_5	$\{s_5\}$	$\{s_4, s_6\}$
s_6	$\{s_6\}$	$\{s_7\}$
s_7	$\{s_7\}$	$\{s_6\}$

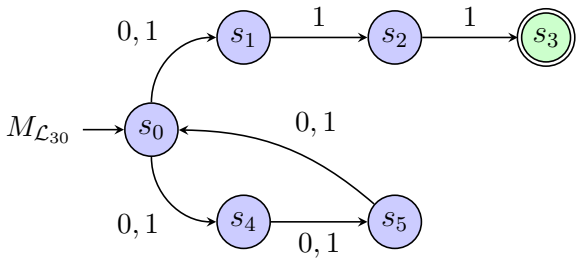
- DFA que reconhece a linguagem $\mathcal{L}_{29}$:



$\mathcal{L}_{30} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é múltiplo de 3 e w termina com 11$\}$.

ER($\mathcal{L}_{30}$) : $((0 \cup 1)(0 \cup 1)(0 \cup 1))^*(0 \cup 1)11$.

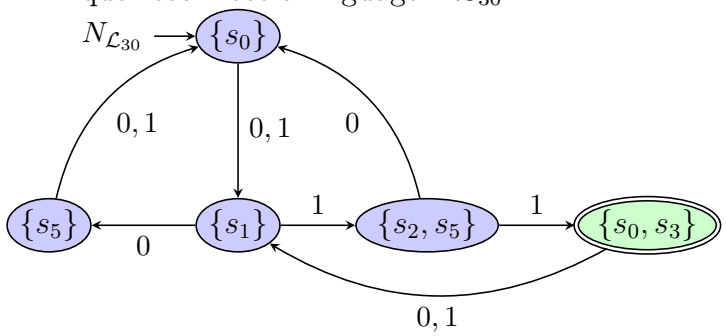
- NFA que reconhece a linguagem $\mathcal{L}_{30}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1, s_4\}$	$\{s_1, s_4\}$
s_1	$\varnothing$	$\{s_2\}$
s_2	$\varnothing$	$\{s_3\}$
s_3	$\varnothing$	$\varnothing$
s_4	$\{s_5\}$	$\{s_5\}$
s_5	$\{s_0\}$	$\{s_0\}$

- DFA que reconhece a linguagem $\mathcal{L}_{30}$:



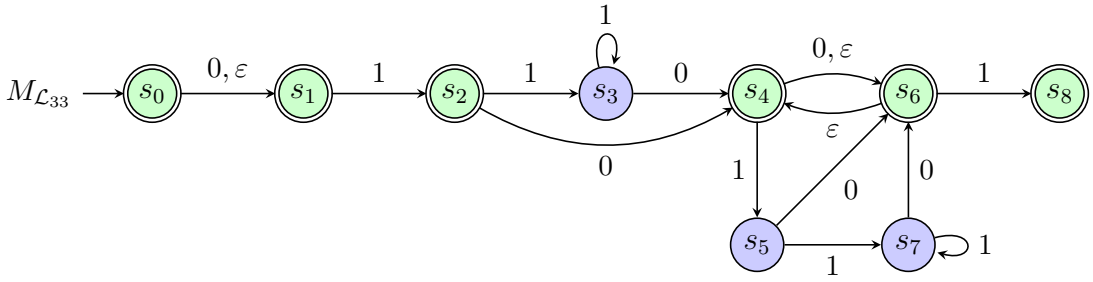
$\mathcal{L}_{31} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ não contém a subcadeia 00 ou a subcadeia 11$\}$.

$\mathcal{L}_{32} = \{w \in \Sigma^* = \{0,1\}^* \mid$ todo par de 0's adjacentes ocorre antes de qualquer par de 1's adjacentes$\}$.

$\mathcal{L}_{33} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não começa com 00 e não termina com 11$\}$.

ER($\mathcal{L}_{33}$) : $\varepsilon \cup 0 \cup 1 \cup 01 \cup (1 \cup 01)(0 \cup 1^+0)(0 \cup 1(0 \cup 1^+0))^*(\varepsilon \cup 1)$.

- NFA que reconhece a linguagem $\mathcal{L}_{33}$:

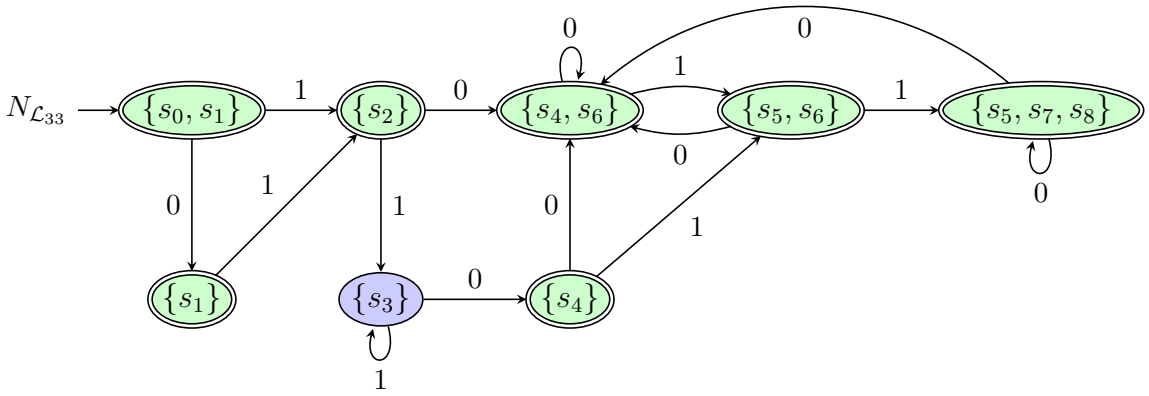


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\{s_2\}$
s_1	$\varnothing$	$\{s_2\}$
s_2	$\{s_4, s_6\}$	$\{s_3\}$
s_3	$\{s_4\}$	$\{s_3\}$
s_4	$\{s_4, s_6\}$	$\{s_5, s_8\}$
s_5	$\{s_6\}$	$\{s_7\}$
s_6	$\{s_4, s_6\}$	$\{s_5, s_8\}$
s_7	$\{s_6\}$	$\{s_7\}$
s_8	$\varnothing$	$\varnothing$

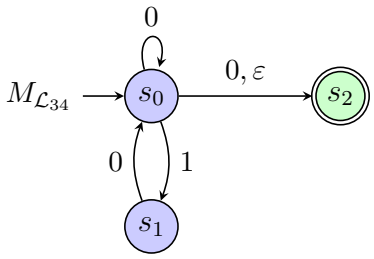
- DFA que reconhece a linguagem $\mathcal{L}_{33}$:



$\mathcal{L}_{34} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ não contém pares de 1's consecutivos$\}$.

ER($\mathcal{L}_{34}$) : $(0 \cup 10)^*(1 \cup \varepsilon)$.

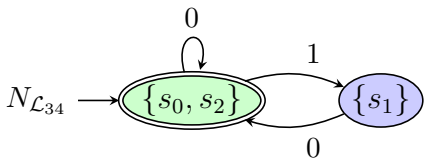
- NFA que reconhece a linguagem $\mathcal{L}_{34}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_2\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_0, s_2\}$	$\{s_1\}$
s_1	$\{s_0, s_2\}$	$\varnothing$
s_2	$\varnothing$	$\varnothing$

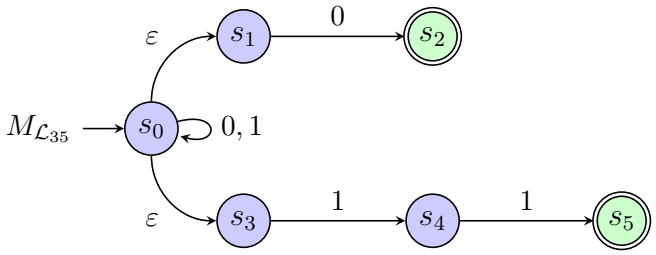
- DFA que reconhece a linguagem $\mathcal{L}_{34}$:



$\mathcal{L}_{35} = \{w \in \Sigma^* = \{0,1\}^* \mid w \text{ termina com 0 ou com 11}\}$.

ER($\mathcal{L}_{35}$) : $(0 \cup 1)^*(0 \cup 11)$.

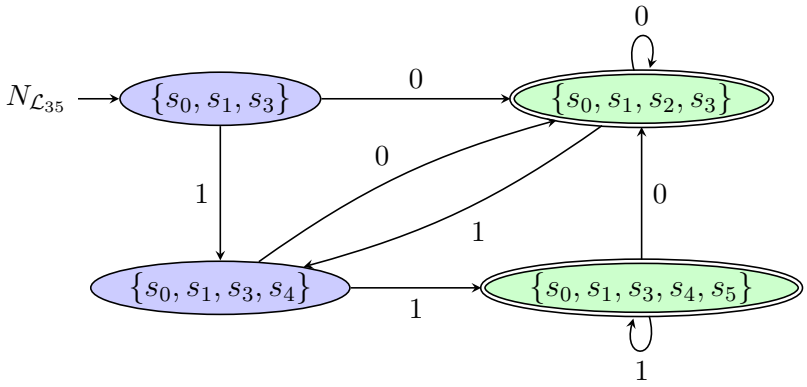
- NFA que reconhece a linguagem $\mathcal{L}_{35}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0, s_1, s_3\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_0, s_1, s_2, s_3\}$	$\{s_0, s_1, s_3, s_4\}$
s_1	$\{s_2\}$	$\varnothing$
s_2	$\varnothing$	$\varnothing$
s_3	$\varnothing$	$\{s_4\}$
s_4	$\varnothing$	$\{s_5\}$
s_5	$\varnothing$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{35}$:

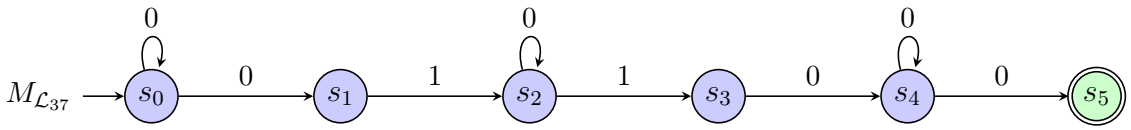


$\mathcal{L}_{36} = \{w \in \Sigma^* = \{0,1\}^* \mid w \text{ contém quantidade par de 0's seguida de quantidade ímpar de 1's}\}$.

$\mathcal{L}_{37} = \{w \in \Sigma^* = \{0,1\}^* \mid w \text{ começa com 0, contém exatamente dois 1's e termina com 00}\}$.

ER($\mathcal{L}_{37}$) : $0^+10^*100^+$.

- NFA que reconhece a linguagem $\mathcal{L}_{37}$:

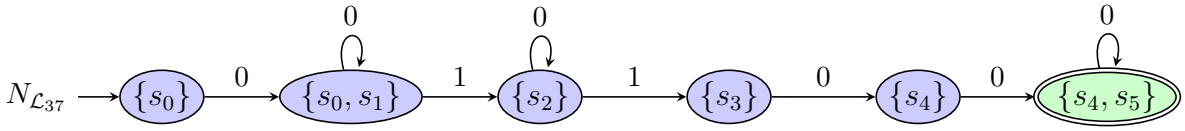


- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.

- Função τ de transições:

τ	0	1
s_0	$\{s_0, s_1\}$	$\varnothing$
s_1	$\varnothing$	$\{s_2\}$
s_2	$\{s_2\}$	$\{s_3\}$
s_3	$\{s_4\}$	$\varnothing$
s_4	$\{s_4, s_5\}$	$\varnothing$
s_5	$\varnothing$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{37}$:

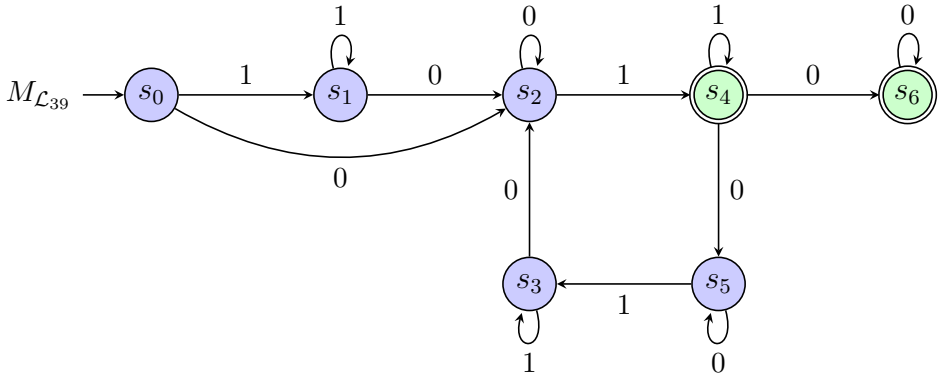


$\mathcal{L}_{38} = \{w \in \Sigma^* = \{0,1\}^* \mid w = 0u1 \text{ ou } w = 1u0, \text{ com } u \in \Sigma^*\}$.

$\mathcal{L}_{39} = \{w \in \Sigma^* = \{0,1\}^* \mid w \text{ contém um número ímpar de ocorrências de } 01\}$.

ER($\mathcal{L}_{39}$) : $(0 \cup 1^+0)(0 \cup 1^+0^+1^+0)^*1^+(\varepsilon \cup 0^+)$.

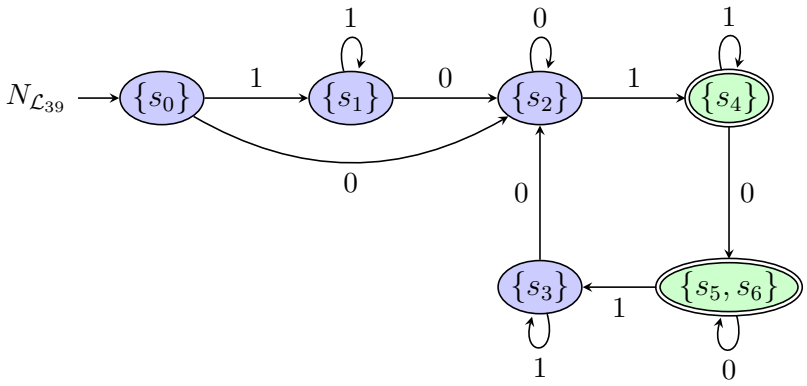
- NFA que reconhece a linguagem $\mathcal{L}_{39}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_2\}$	$\{s_1\}$
s_1	$\{s_2\}$	$\{s_1\}$
s_2	$\{s_2\}$	$\{s_4\}$
s_3	$\{s_2\}$	$\{s_3\}$
s_4	$\{s_5, s_6\}$	$\{s_4\}$
s_5	$\{s_5\}$	$\{s_3\}$
s_6	$\{s_6\}$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{39}$:



$\mathcal{L}_{40} = \{w \in \Sigma^* = \{0,1\}^* \mid 0^n,\ n \in \mathbb{N}$, e n é múltiplo de 2 ou de 3$\}$.

$\mathcal{L}_{41} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ é um número binário maior que zero e múltiplo de 3$\}$.

$\mathcal{L}_{42} = \{w \in \Sigma^* = \{0,1\}^* \mid w$ é número binário, não negativo, divisível por 4 (sem 0's iniciais redundantes)$\}$.

$\mathcal{L}_{43} = \{w \in \Sigma^* = \{0,1\}^* \mid$ toda subcadeia de w de comprimento 4 contém exatamente um 1$\}$.

$\mathcal{L}_{44} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_0$ é par e $|w|_1$ é par.

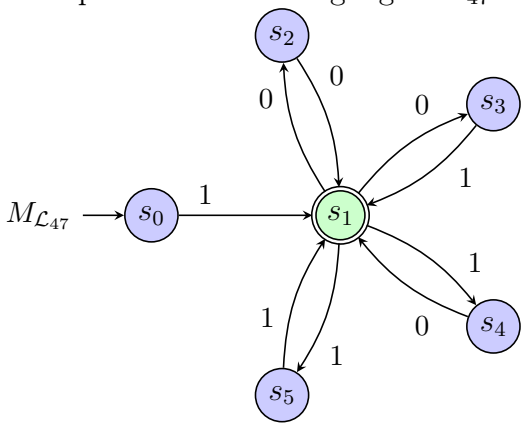
$\mathcal{L}_{45} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_0$ é par e $|w|_1$ é ímpar.

$\mathcal{L}_{46} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|_0$ é par e $|w|_1$ é divisível por 3$\}$.

$\mathcal{L}_{47} = \{w \in \Sigma^* = \{0,1\}^* \mid |w|$ é ímpar e w começa com 1$\}$.

ER($\mathcal{L}_{47}$) : $1((0 \cup 1)(0 \cup 1))^*$.

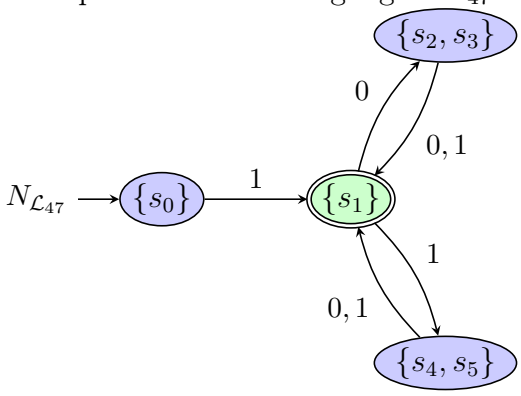
- NFA que reconhece a linguagem $\mathcal{L}_{47}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\varnothing$	$\{s_1\}$
s_1	$\{s_2, s_3\}$	$\{s_4, s_5\}$
s_2	$\{s_1\}$	$\varnothing$
s_3	$\{s_1\}$	$\varnothing$
s_4	$\varnothing$	$\{s_1\}$
s_5	$\varnothing$	$\{s_1\}$

- DFA que reconhece a linguagem $\mathcal{L}_{47}$:



$\mathcal{L}_{48} = \{w \in \Sigma^* = \{0,1\}^* \mid\ w = 0u$ e $|w|$ é ímpar ou $w = 1u$ e $|w|$ é par, com $u \in \Sigma^*\}$.

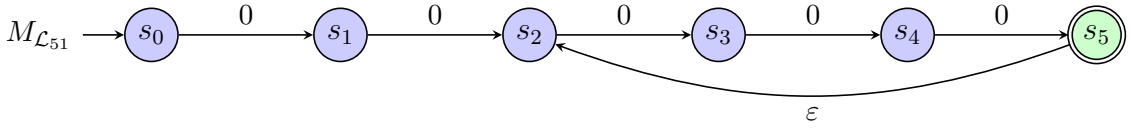
$\mathcal{L}_{49} = \{w \in \Sigma^* = \{0,1\}^* \mid\ w$ termina com 010 e contém 011$\}$.

$\mathcal{L}_{50} = \{w \in \Sigma^* = \{0,1\}^* \mid\ w = 1u1$, com $u \in \Sigma^*$, e w não contém 11 e 000$\}$.

$\mathcal{L}_{51} = \{w \in \Sigma^* = \{0,1\}^* \mid\ w = 0^{3n+5},\ n \geqslant 0\}$.

ER($\mathcal{L}_{51}$) : $(000)^*00000$.

- NFA que reconhece a linguagem $\mathcal{L}_{51}$:



- Fecho-ε do estado s_0: $\mathcal{F}_\varepsilon(s_0) = \{s_0\}$.
- Função τ de transições:

τ	0	1
s_0	$\{s_1\}$	$\varnothing$
s_1	$\{s_2\}$	$\varnothing$
s_2	$\{s_3\}$	$\varnothing$
s_3	$\{s_4\}$	$\varnothing$
s_4	$\{s_2, s_5\}$	$\varnothing$
s_5	$\{s_3\}$	$\varnothing$

- DFA que reconhece a linguagem $\mathcal{L}_{51}$: