Ejercicio 3. Dado el alfabeto $\Sigma = \{0,1\}$ y los siguientes lenguajes $\mathcal{L}_1$ y $\mathcal{L}_2$, dar un autómata finito determinístico para $\mathcal{L}_1 \cap \mathcal{L}_2$:

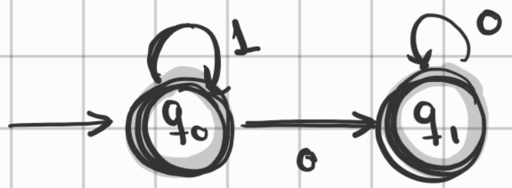
$\mathcal{L}_1 = \{\alpha \mid \alpha \in \Sigma^* \wedge 01 \text{ es subcadena de } \alpha\}$.

$\mathcal{L}_2 = \{\alpha \mid \alpha \in \Sigma^* \wedge \alpha \text{ tiene una cantidad par de ceros}\}$.

$$\left.\begin{array}{l} (\mathcal{L}_1 \cap \mathcal{L}_2)^c = \mathcal{L}_1^c \cup \mathcal{L}_2^c \\ (\mathcal{L}_1^c \cup \mathcal{L}_2^c)^c = \mathcal{L}_1 \cap \mathcal{L}_2 \end{array}\right\} \text{ Busco } \mathcal{L}_1^c \text{ y } \mathcal{L}_2^c$$

$\mathcal{L}_1^c = \{\alpha \in \Sigma^* \mid 01$ no es subcadena$\}$

01* NO *01* NO *01



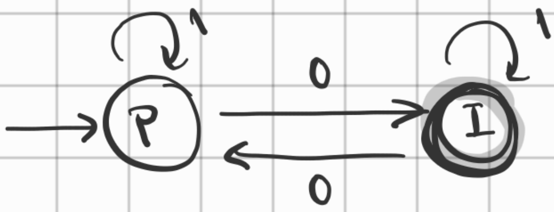
00 ✓

01* ✓

00101 x ✓

11 ✓

$\mathcal{L}_2^c = \{\alpha \in \Sigma^* \mid \alpha$ tiene una cant impar de 0$\}$

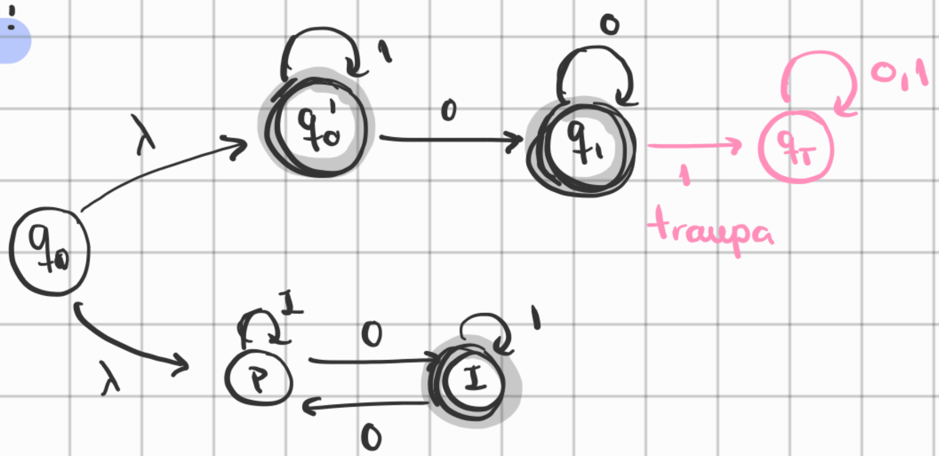


010 x ✓

011 ✓

01100 ✓

$\mathcal{L}_1^c \cup \mathcal{L}_2^c$:



Ahora hay que pasarlo a AFD y después buscamos el 1^c

	0	1	λ
q_0	$\emptyset$	$\emptyset$	$\{q_0', p\}$
q_0'	q_1	q_0'	q_0'
q_1	q_1	q_T	q_1
q_T	q_T	q_T	q_T
p	I	p	p
I	p	I	I

Tengo esto

$$Cl_\lambda(q_0) = \{q_0, q_0', p\}$$

$$M'(\{q_0, q_0', p\}) \underset{0}{=} M'(\{\emptyset, q_1, i\}) \underset{\lambda}{=} \{q_1, i\}$$

$$\underset{1}{=} M'(\{\emptyset, q_0', p\}) \underset{\lambda}{=} \{q_0', p\}$$

Q' \ q \ Σ	M' 0	M' 1
1) $Cl_\lambda(q_0)$	2) $\{q_1, i\}$	3) $\{q_0', p\}$
$Cl_\lambda(q_1, i)$	4 $\{q_1, p\}$	5 $\{q_T, i\}$
$Cl_\lambda(q_0', p)$	$\{q_1, i\}$	$\{q_0', p\}$
$Cl_\lambda(q_1, p)$	$\{q_1, i\}$	6) $\{q_T, p\}$
$Cl_\lambda(q_T, i)$	$\{q_T, p\}$	$\{q_T, p\}$
$Cl_\lambda(q_T, p)$	$\{q_T, i\}$	$\{q_T, p\}$

$$Cl_\lambda(\{q_1, i\}) = \{q_1, i\}$$

- $M'(\{q_1, i\}) \overset{0}{=} \{q_1, p\} \underset{\lambda}{=} \{q_1, p\}$
  $\underset{1}{=} \{q_T, i\}$
- $M'(q_0', p) \underset{0}{=} \{q_1, i\} \underset{\lambda}{=} q_1, i$
  $\underset{1}{=} \{q_0', p\} \underset{\lambda}{=} \{q_0', p\}$
- $M'(q_1, p) \underset{0}{=} \{q_1, i\} \underset{\lambda}{=} \{q_1, i\}$

$(L_1^c \cup L_2^c)^c \rightarrow$ como ya está completo.

Antes $q_f = i \mid q_0' \mid q_1 \rightsquigarrow$ ahora: $q_f = \{q_T, p\}$