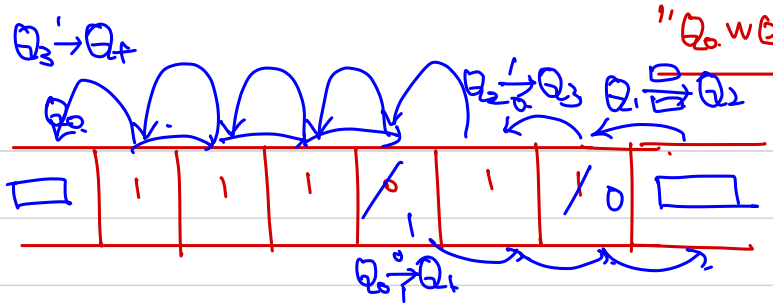
"$Q_0 w(x) \bigcirc w(y) \vdash Q_f^* w(x+y) \bigcirc$"



$\delta(Q_0, 1) = (Q_0, 1, R)$

$\delta(Q_0, 0) = (Q_1, 1, R)$

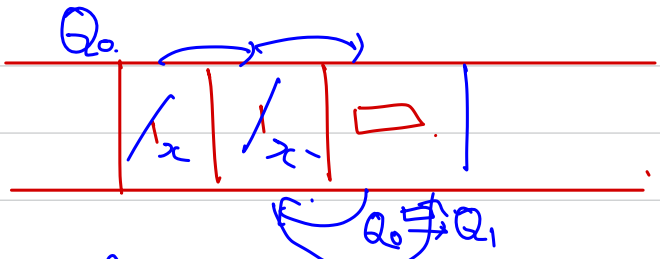
$\delta(Q_1, 1) = (Q_1, 1, R)$

$\delta(Q_1, \square) = (Q_2, \square, L)$

$\delta(Q_2, 1) = (Q_3, 0, L)$

$\delta(Q_3, 1) = (Q_3, 1, L)$

$\delta(Q_3, \square) = (Q_f, \square, R)$



$\delta(Q_0, 1) = (Q_0, x, R)$

$\delta(Q_0, \square) = (Q_1, \square, L)$

$\delta(Q_1, 1) = (Q_1, 1, L)$

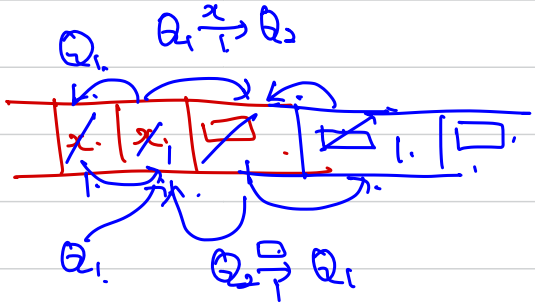
$\delta(Q_1, x) = (Q_2, 1, R)$

$\delta(Q_2, 1) = (Q_2, 1, R)$

$\delta(Q_2, \square) = (Q_1, 1, L)$

$\delta(Q_1, \square) = (Q_f, \square, R)$

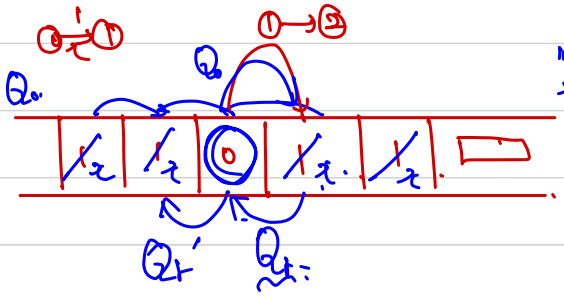
$Q_0 \| \vdash^*$



$Q_1 \rightarrow$ go to rightmost x.

$Q_0 111011$

$$\begin{cases} x \geq y & Q_0 w(x) 0 w(y) \vdash Q_y w(x) 0 w(y) \\ x < y & Q_0 w(x) 0 w(y) \vdash Q_n w(x) 0 w(y) \end{cases}$$



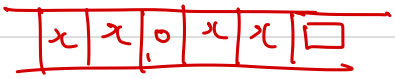
"위수를 매칭시킬 수 있다"

$$Q_0 \to Q_1 \to Q_2 \to Q_r, Q_r'$$

"reset을 했을 때 0을 만나는 상황"

→ 뒤에 뭐가 남았는지를 확인해야 한다.

$Q_0 \to Q_c$



남아있는 1이 없는 경우

$\delta(Q_c, \square) = (Q_{y0}, 1, L)$ (preparing accept)

$\delta(Q_c, 1) = (Q_{n0}, 1, L)$

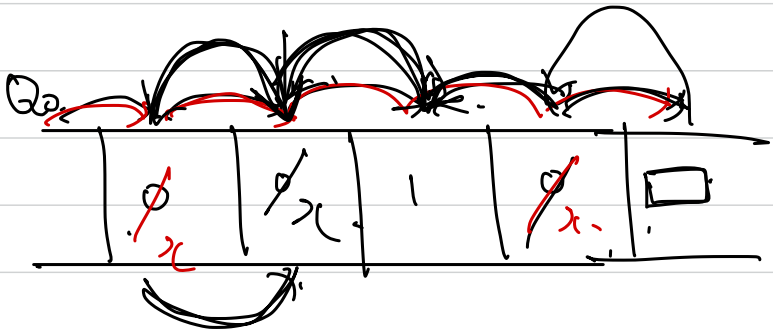
$\delta(Q_{n0}, x) = (Q_{n0}, 1, L)$, $\delta(Q_{n0}, \square) = \delta(Q_n, \square, R)$

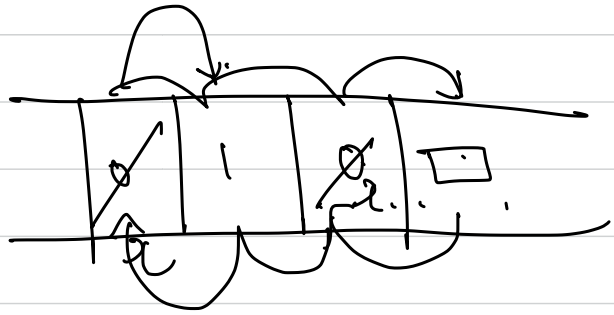
#

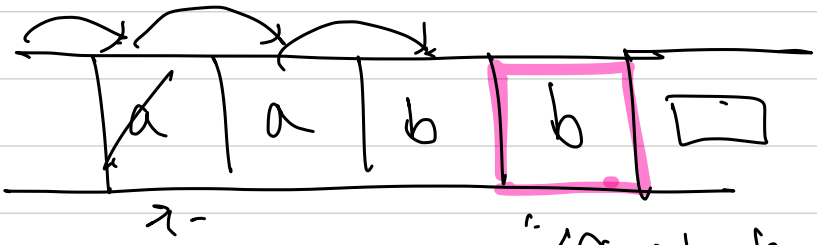
Construct a Turing machine that will accept the following language on $\boxed{\{0,1\}}$.

$L = \{ w : |w| \bmod 4 = 0 \}$. ("길이가 4의 배수이면 accept")

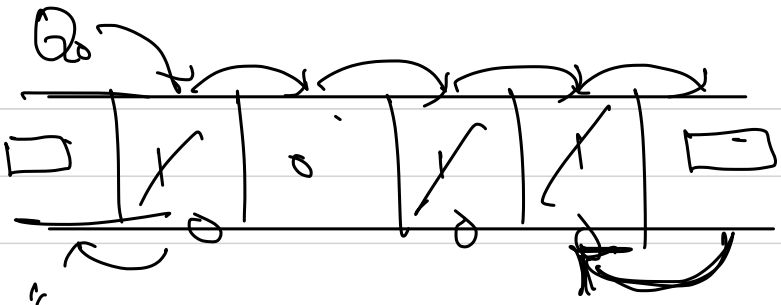
$M = (Q, \Sigma, \Gamma, \delta, Q_0, \square, F)$

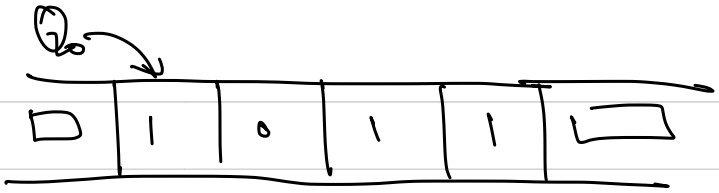






"leftmost b"



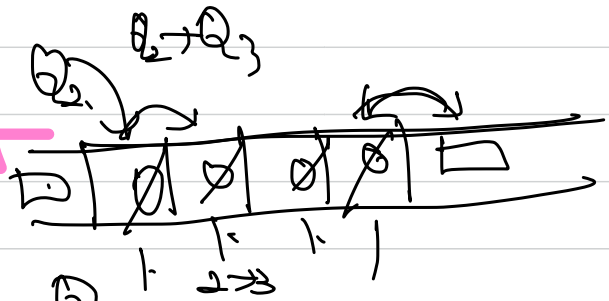


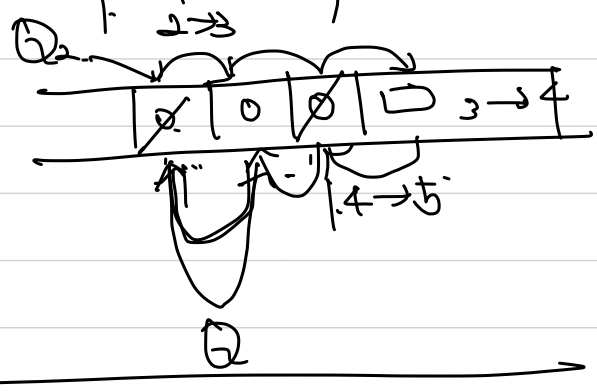
일단 싹다 0으로 바꾸기

$\delta(Q_0, 1) = (Q_0, 0, R)$

$\delta(Q_0, 0) = (Q_0, 0, R)$

$\delta(Q_0, \square) = (Q_1, \square, L)$





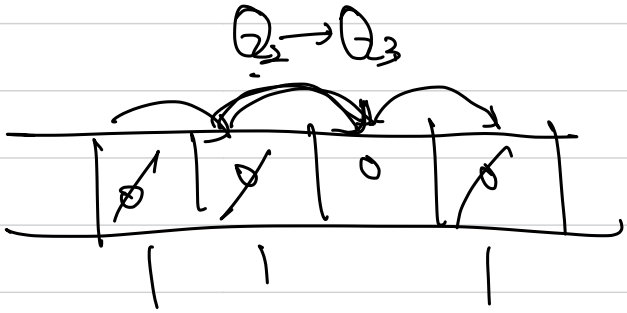
$\delta(Q_1, 0) = (Q_1, 0, L)$

$\delta(Q_1, \square) = (Q_2, \square, R)$

↓

$\delta(Q_2, 0) = (Q_3, 1, R)$

$\delta(Q_2,$



$\delta(Q_3, 0) = (Q_3, 0, R)$

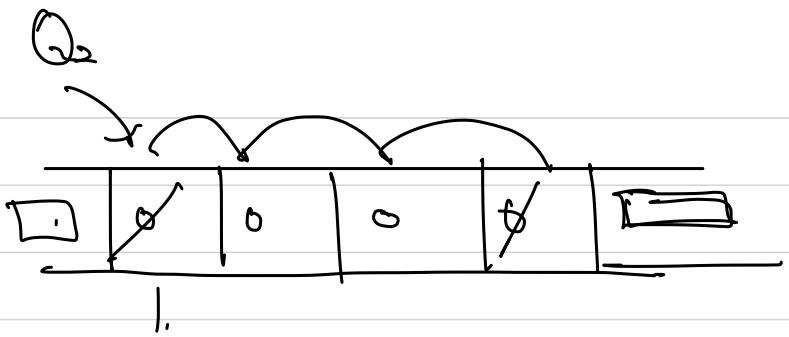
$\delta(Q_3$

$\delta(Q_3, \square) = (Q_4, \square, L)$

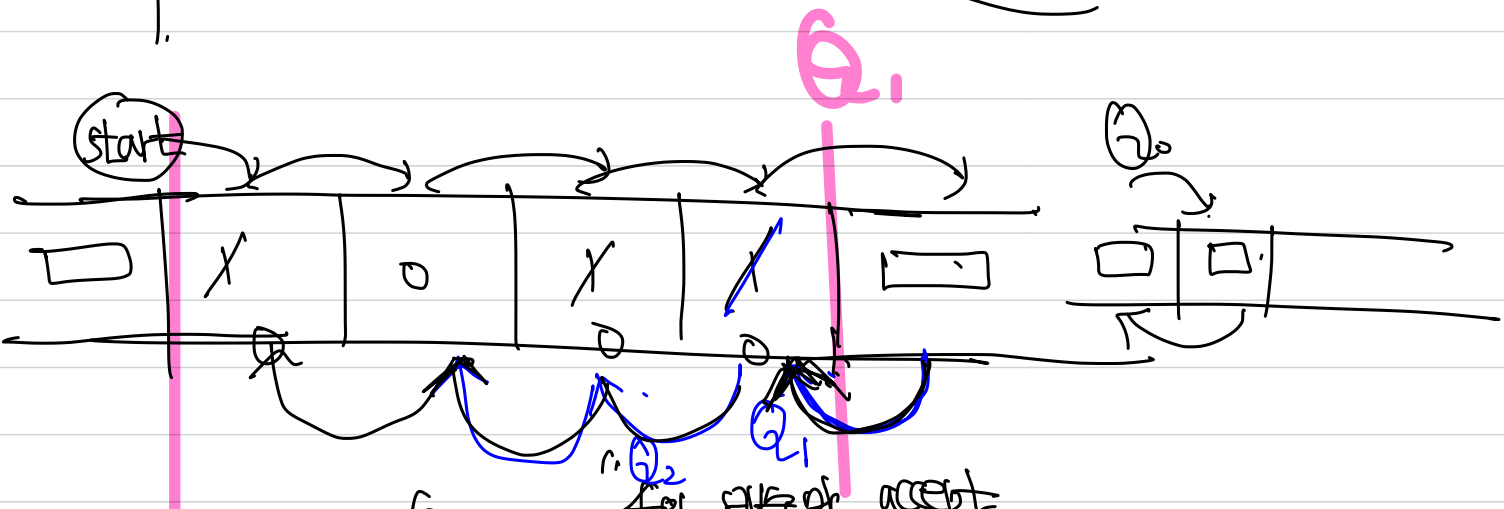
$\delta(Q_4, 0) = (Q_5, 1, L)$

$\delta(Q_5, 0) = (Q_5, 0, L)$

$\delta(Q_5, 1) = (Q_2, 1, R)$



아무것도 Q는 language.



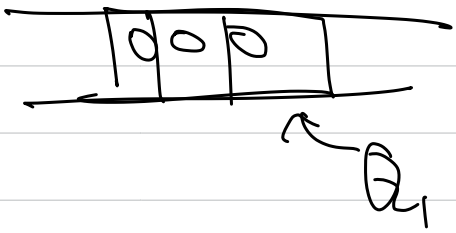
4의 배수만 accept

$\delta(Q_0, \square) = (Q_1, \square, L)$

input

$$\boxed{\begin{aligned} \delta(Q_0, 1) &= (Q_0, 0, R \\ \delta(Q_0, 0) &= (Q_0, 0, R) \\ \delta(Q_0, \square) &= (Q_1, \square, L) \end{aligned}}$$

다. 0으로 바꿈.



$\delta(Q_1, 0) = (Q_2, 0, L)$

$\delta(Q_2, 0) = (Q_3, 0, L)$

$\delta(Q_3, 0) = (Q_4, 0, L)$

$\delta(Q_4, 0) = (Q_1, 0, L)$

⇒ 만약 중간에 끊기

Q_3에서 $\square$ 나오면

$\delta(Q_1, \square) = (Q_4, \square, R)$

START