

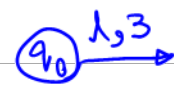
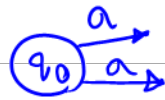
DFA $\Sigma = \{a, b\}$



$$\delta(q_i, a) = q_i$$

$$\delta^*(q_i, \text{string}) = q_i$$

NFA $\Sigma = \{a, b\}$

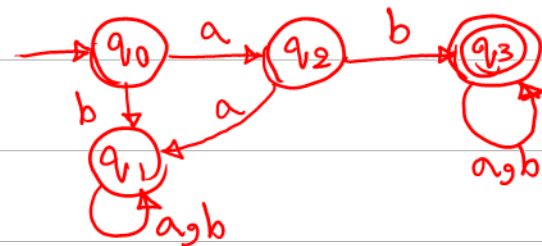


$$\delta(q_i, a) = \{q_i, q_k, \dots\}$$

$$\delta^*(q_i, \text{string}) = \{ _ \}$$

Q: $L = \{\text{All strings with prefix 'ab'}\}$ $\Sigma = \{a, b\}$

DFA:

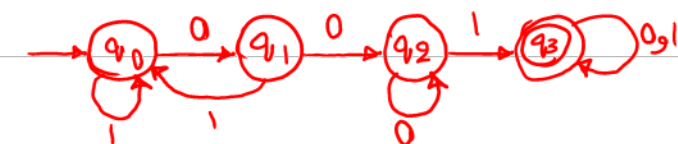


NFA:

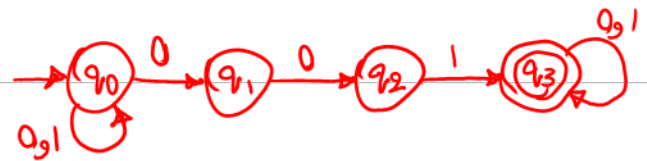


Q: $L = \{\text{All string include '001'}\}$ $\Sigma = \{0, 1\}$

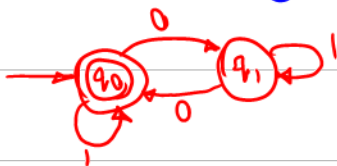
DFA:



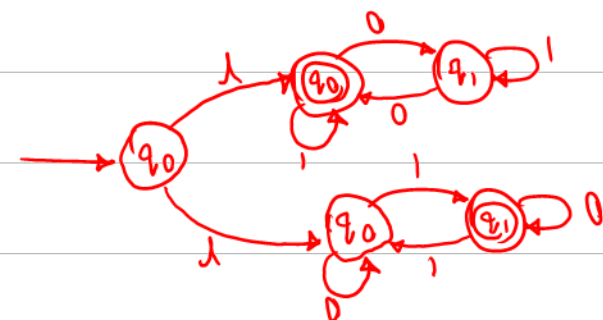
NFA



Q: $L = \{\text{All string with even number '0'}\}$ $\Sigma = \{0, 1\}$



Q: $L = \{\text{even number of '0' or odd numbers of '1's'}\}$

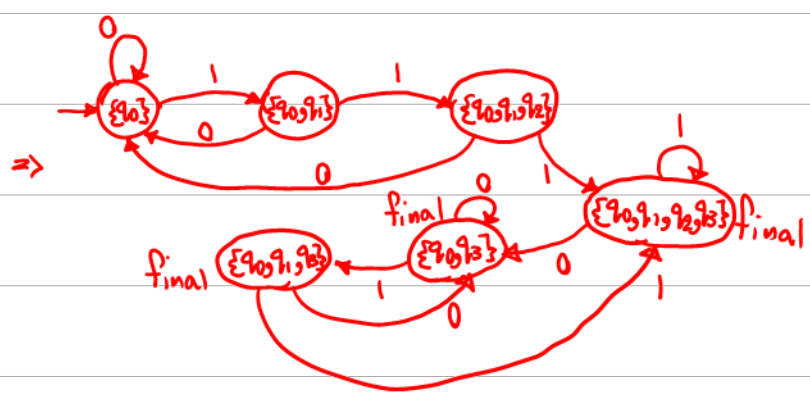


Q: NFA to DFA



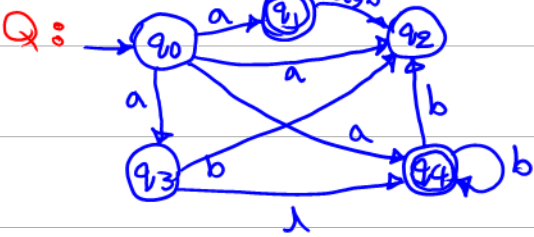
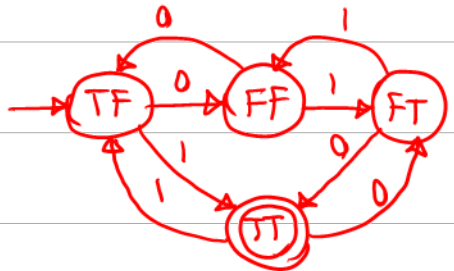
δ^*

	0	1
q_0	$\{q_0\}$	$\{q_0, q_1\}$
q_1	\emptyset	$\{q_2\}$
q_2	\emptyset	$\{q_3\}$
q_3	$\{q_3\}$	$\{q_3\}$



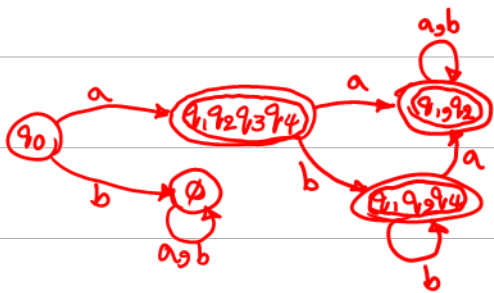
Q: even 0's AND odd 1's

A	B	
T	T	T
F	T	F
T	F	F
F	F	F



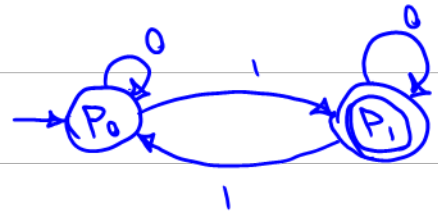
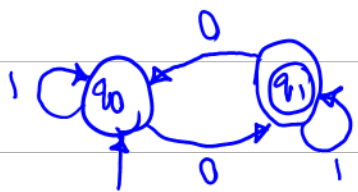
δ^*

	a	b
q_0	$\{q_1, q_2, q_3, q_4\}$	\emptyset
q_1	$\{q_1, q_2\}$	$\{q_1, q_2\}$
q_2	$\{q_1\}$	$\{q_1\}$
q_3	\emptyset	$\{q_2, q_1, q_4\}$
q_4	\emptyset	$\{q_1, q_2, q_4\}$

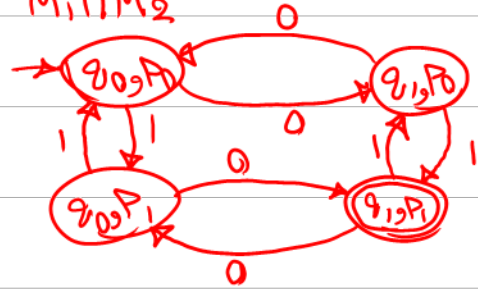


Q: M_1

M_2



$M_1 \cap M_2$



Q: $(0^* | 0^* 1)^* 0^* \rightsquigarrow L = \{w \mid n(1) = 2k+1\}$

- ① *
- ② 0
- ③ +

Q: $R_1 * R_2 + R_3 \rightsquigarrow ((R_1 *) R_2) + R_3$

Q: $(0^* | 0^* 1 | 0^* 1 0^*)^* | (0^* | 0^* 1 | 0^*)^*$ \rightsquigarrow $0^* 1^* 0^*$

Q: $\{w \in \{0,1\}^* \mid w \text{ doesn't contain '10'}\} \rightsquigarrow 0^* 1^*$

Q: $\{w \in \{0,1\}^* \mid w \text{ contains } 00\} \rightsquigarrow (0+1)^* 00 (0+1)^*$

Q: w contains at least three 0 $\rightarrow (0+1)^* 0 (0+1)^* 0 (0+1)^* 0 (0+1)^*$

Q: at most one zero $\rightarrow 1^* \underbrace{(0+1)}_{0?} 1^*$

Q: $|w|$ is odd $\rightarrow ((0+1)(1+0))^* (0+1)$

$\alpha \equiv \beta$ ① $\alpha \equiv \alpha$ ② $\alpha \equiv \beta \Rightarrow \beta \equiv \alpha$ ③ $\alpha \equiv \beta, \beta \equiv \gamma \Rightarrow \alpha \equiv \gamma$ (ترالذي)

① $A+B \equiv B+A$ ② $\alpha + \alpha \equiv \alpha$ ③