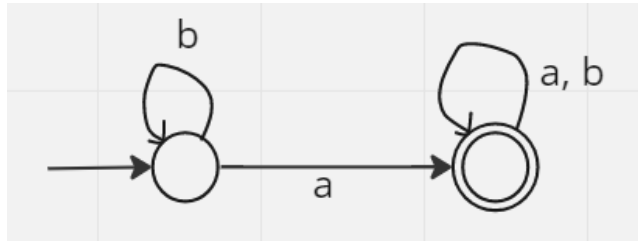


Deterministic Finite Automata

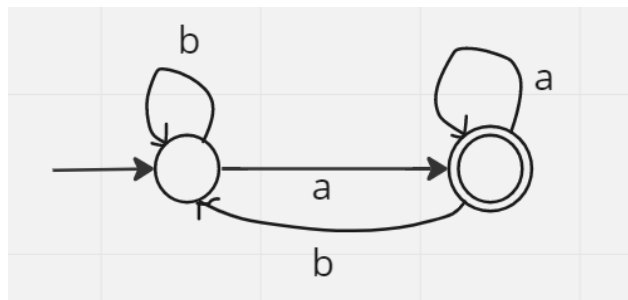
$L(M) = \{w : w \text{ is a string over } \Sigma \text{ and } M \text{ accepts } w\}, \Sigma = \{a, b\}$

All the following examples have same alphabet Σ

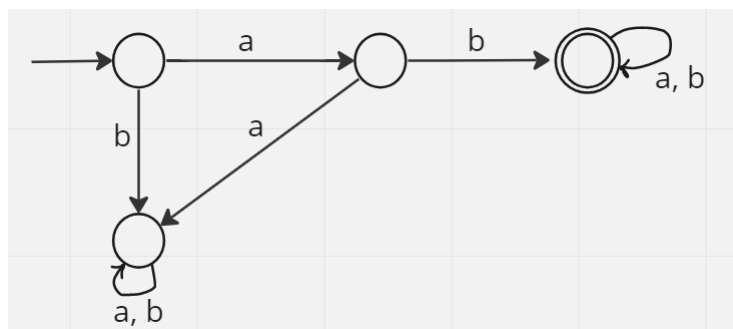
$L(M) = \{w : w \text{ contains 'a'}\}$



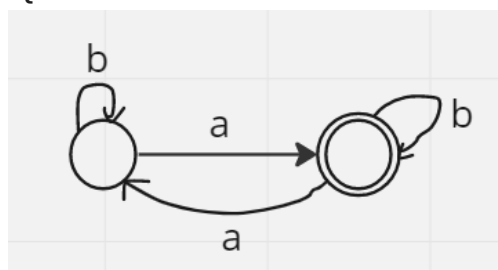
$L(M) = \{w : w \text{ ends with 'a'}\}$



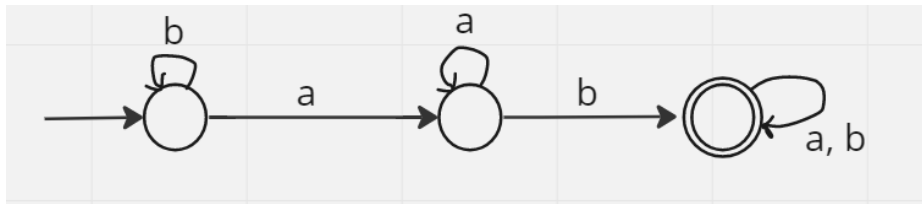
$L(M) = \{w : w \text{ starts with 'ab'}\}$



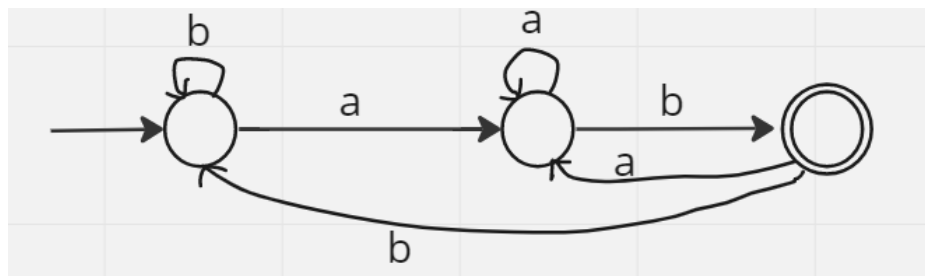
$L(M) = \{w : w \text{ contains odd number of 'a'}\}$



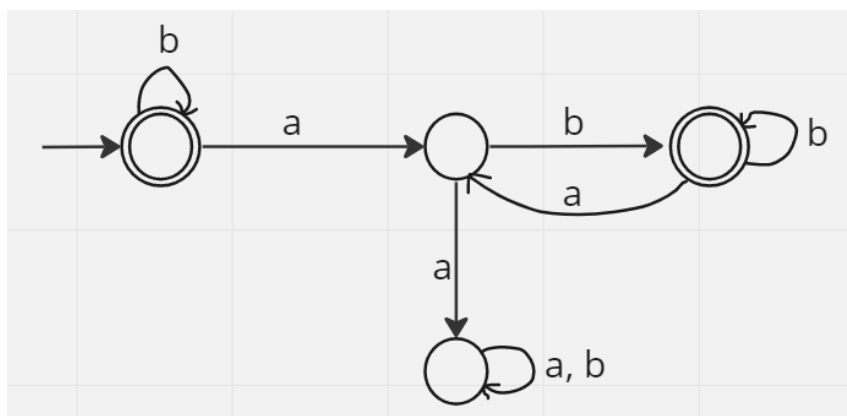
$L(M) = \{ w : w \text{ contains 'ab'} \}$



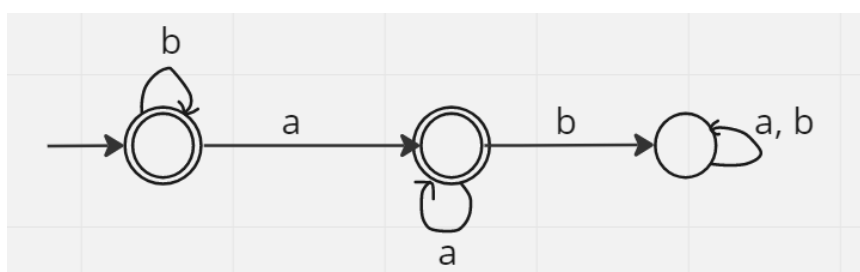
$L(M) = \{ w : w \text{ ends with 'ab'} \}$



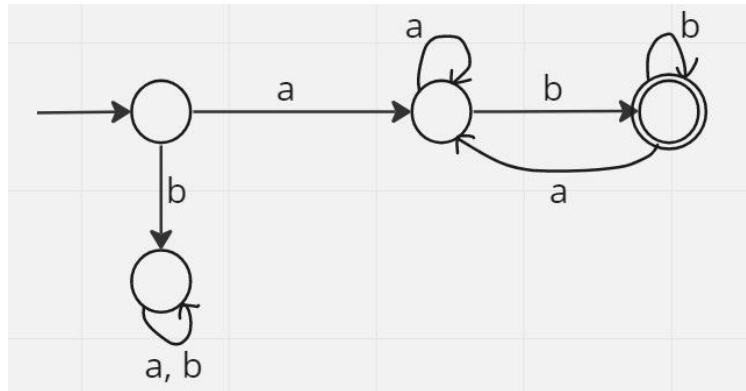
$L(M) = \{ w : \text{every 'a' should be followed by 'b'} \}$



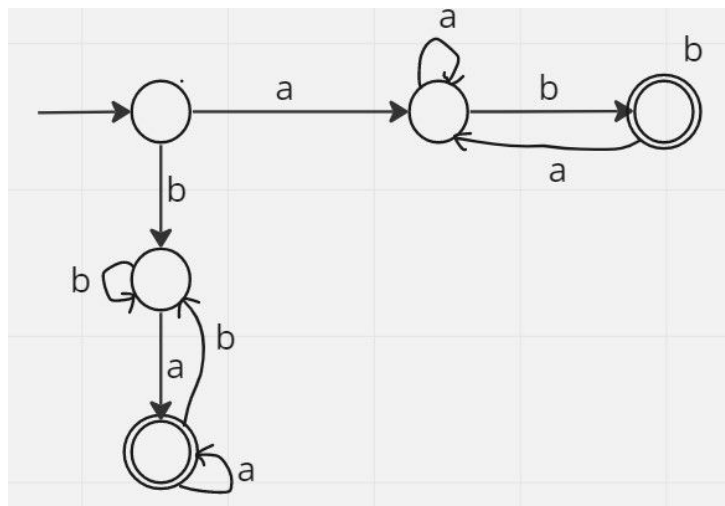
$L(M) = \{ w : \text{'a' must not be followed by 'b'} \}$



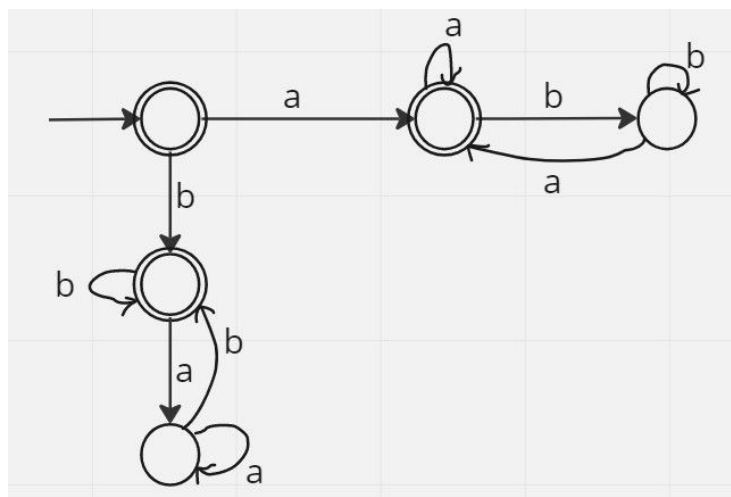
$L(M) = \{ w : w \text{ starts with 'a' and ends with 'b'} \}$



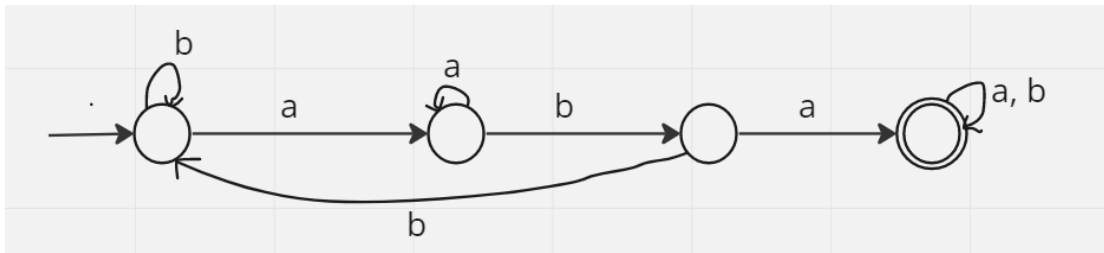
$L(M) = \{ w : \text{start and end with different character} \}$



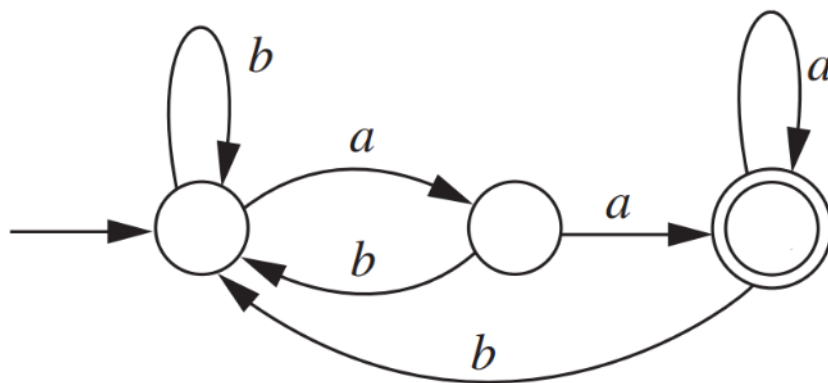
$L(M) = \{ w : \text{start and end with same character} \}$



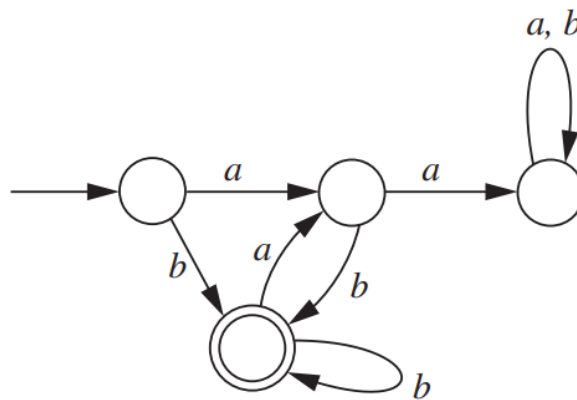
$L(M) = \{ w : w \text{ contains 'aba' as a substring} \}$



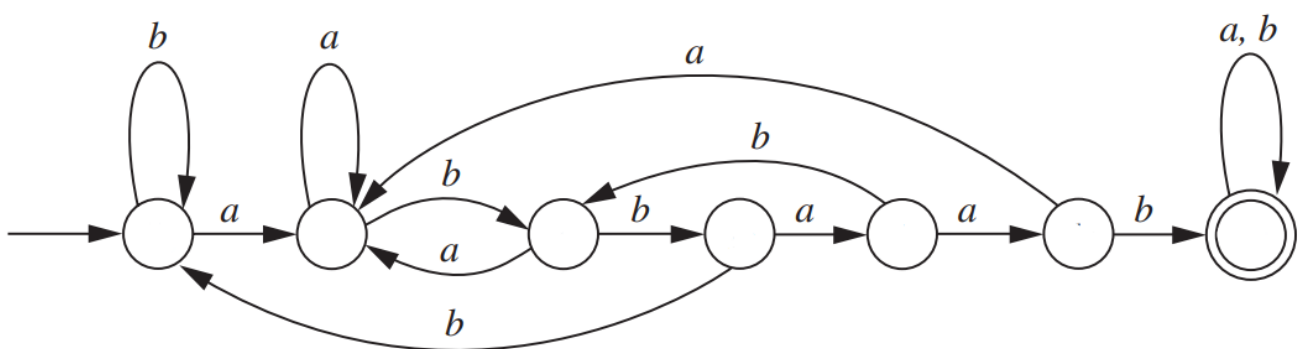
$L(M) = \{ w : w \text{ ends with 'aa'} \}$



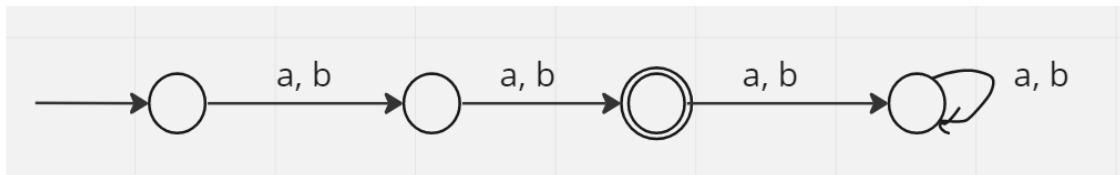
$L(M) = \{ w : w \text{ ends with 'b' and doesn't contain 'aa'} \}$



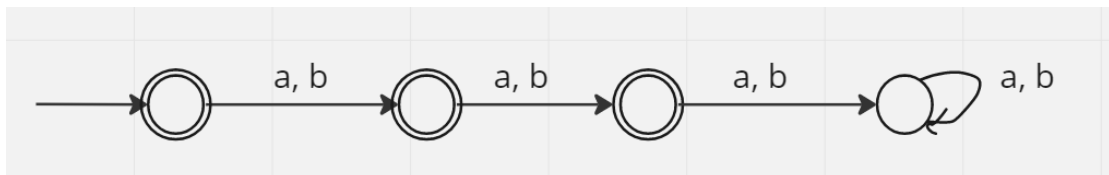
$L(M) = \{ w : w \text{ contains 'abbaab'} \}$



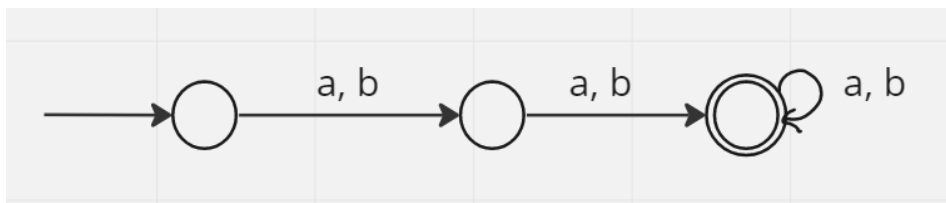
$$L(M) = \{ w : \text{length of } w \text{ is exactly } 2 \}$$



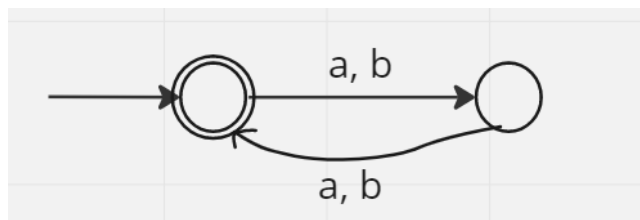
$$L(M) = \{ w : \text{length of } w \text{ is at most } 2 \}$$



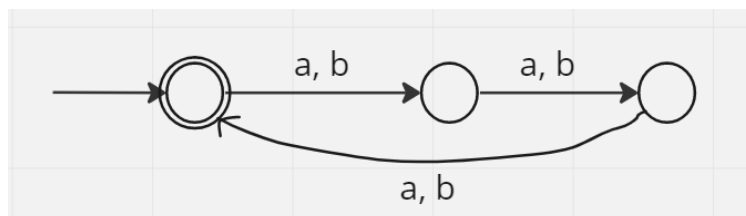
$$L(M) = \{ w : \text{length of } w \text{ is at least } 2 \}$$



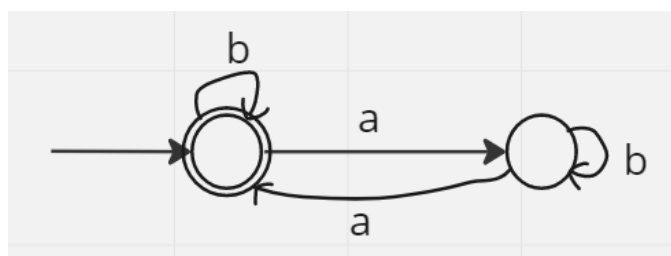
$$L(M) = \{ w : \text{length is multiple of } 2 \}$$



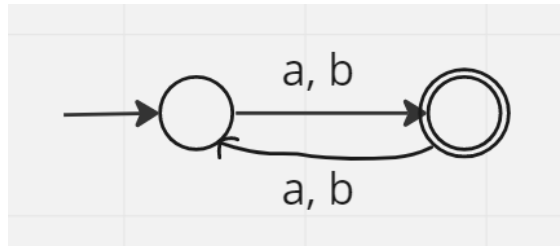
$$L(M) = \{ w : \text{length is multiple of } 3 \}$$



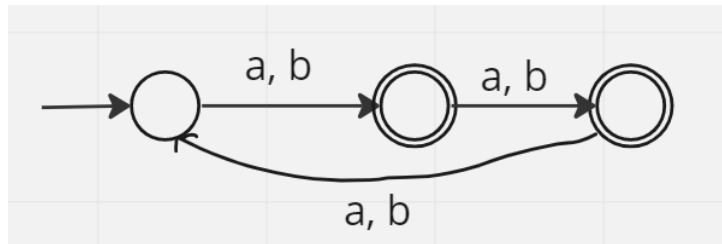
$$L(M) = \{ w : \text{number of } a \text{ is even} \}$$



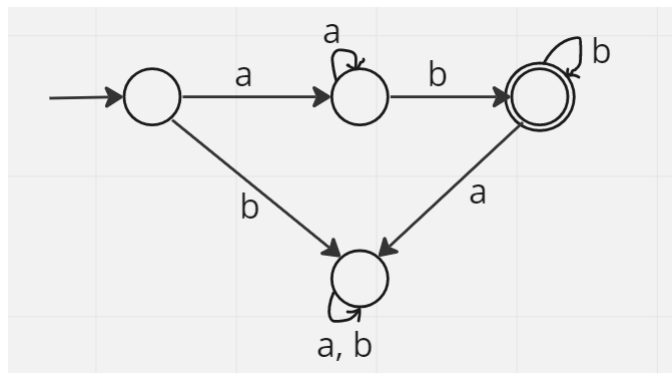
$$L(M) = \{ w : \text{length is odd} \}$$



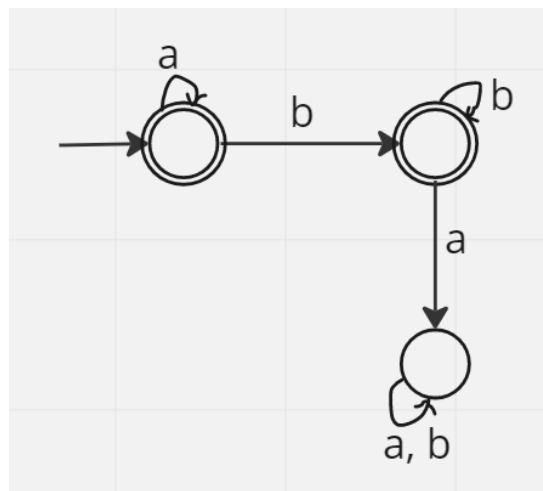
$$L(M) = \{ w : \text{length is not divisible by 3} \}$$



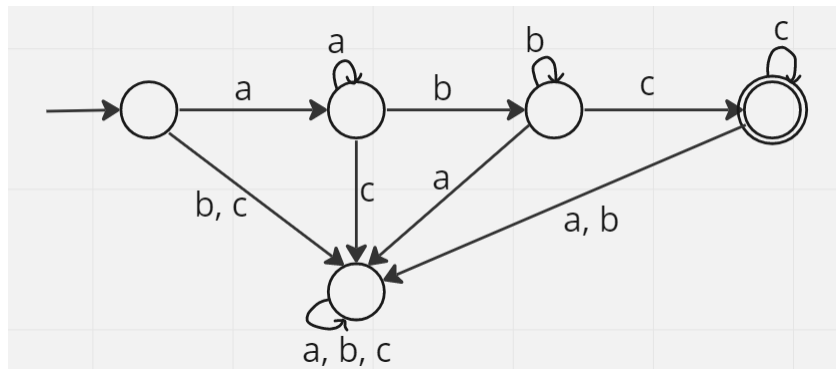
$$L = \{ a^m b^n \text{ where } m, n \geq 1 \}$$



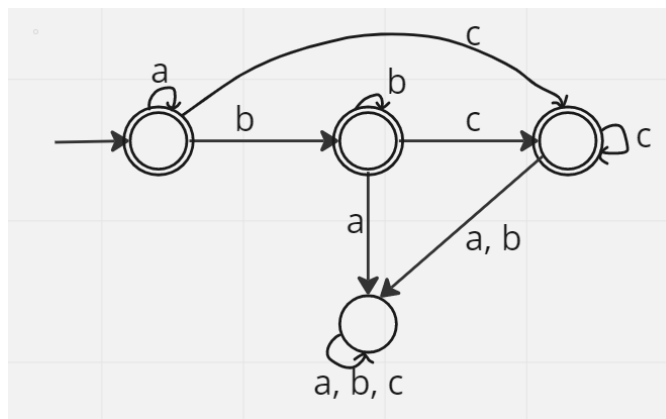
$$L = \{ a^m b^n \text{ where } m, n \geq 0 \}$$



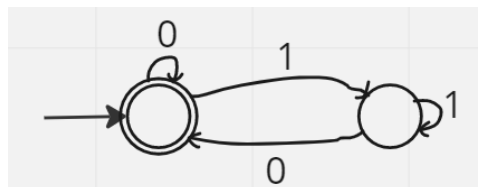
$$L = \{a^m b^n c^l \text{ where } m, n, l \geq 1\}$$



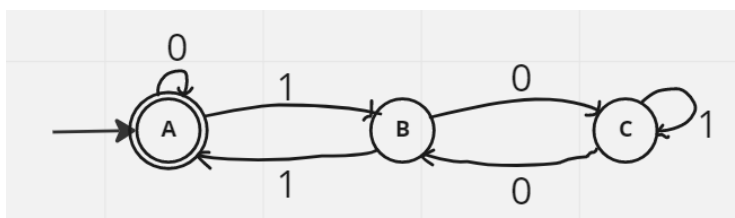
$$L = \{a^m b^n c^l \text{ where } m, n, l \geq 0\}$$



$$L = \{w : w \in \{0, 1\}^* \text{ is a binary number divisible by '2'}\}$$



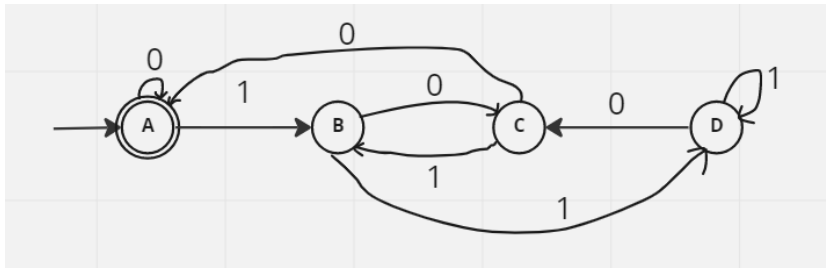
$$L = \{w : w \in \{0, 1\}^* \text{ is a binary number divisible by '3'}\}$$



Use transition table to easily construct DFA

	0	1
*A	A	B
B	C	A
C	B	C

$L = \{ w : w \in \{0, 1\}^* \text{ is a binary number divisible by '4'} \}$



	0	1
*A	A	B
B	C	D
C	A	B
D	C	D