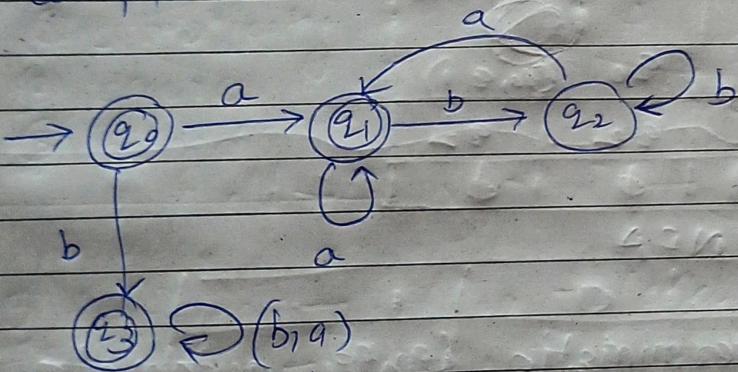


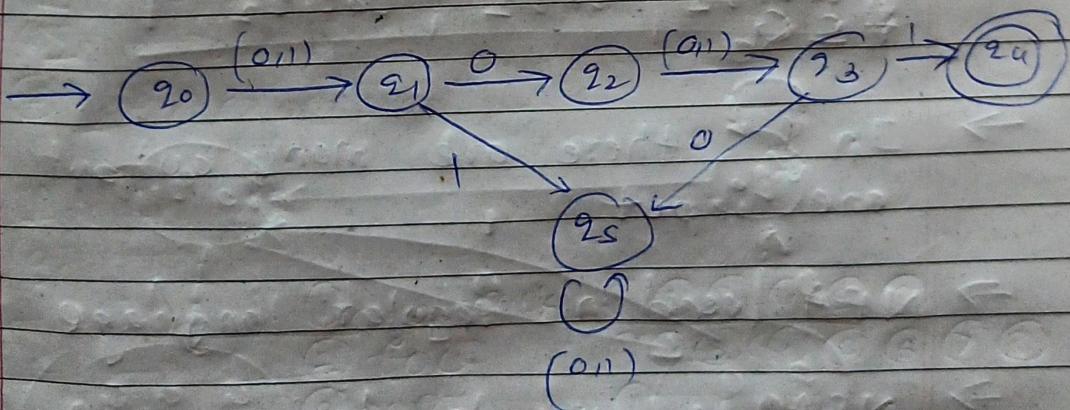
$$L = \{ab, aab, a^3bab\}$$

$\Rightarrow L = \{ \text{not starting with } a, \text{ not ending with } b \}$

Complement



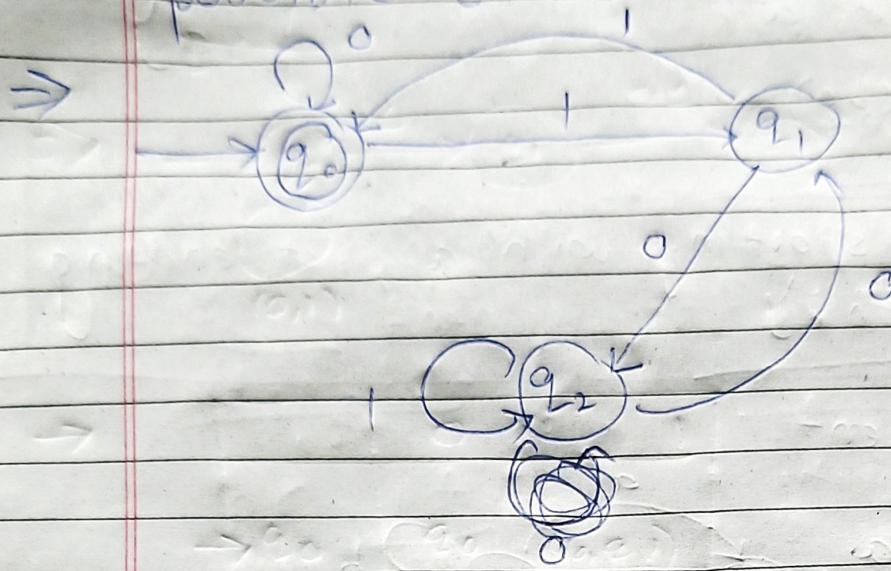
$\Rightarrow L = \{ \text{second symbol is } 0 \text{ or } 4^{\text{th}} \text{ is } 1 \}$



$\Rightarrow L = \{ \text{binary string divisible by 3} \}$

remainder $\rightarrow 0, 1, 2$

possible remainder $\rightarrow 3 \rightarrow 0112$
possible states $\rightarrow 3$



* N DFA / NFA

\rightarrow Non deterministic finite automata

\rightarrow $NFA(Q, \Sigma, q_0, f, \delta)$

$$F \subseteq Q$$

\rightarrow In f there are many output for one input

\rightarrow NFA used in regular language

\rightarrow NFA is easy to design

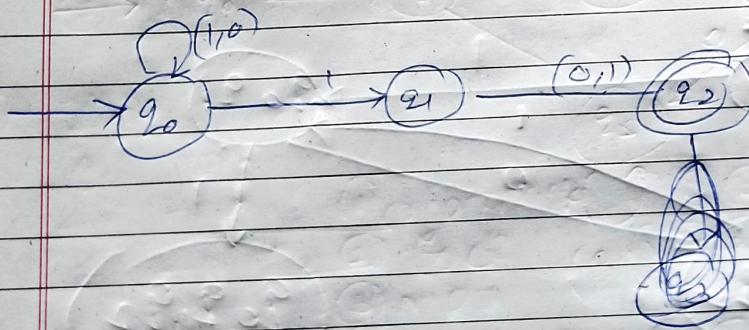
* DFA vs NFA

① dead config not allowed	① dead config allowed
② multiple choices not allowed	② multiple choices allowed
③ E-move not allowed	③ E-move allowed
④ deterministic	④ Not deterministic
⑤ designing difficult	⑤ designing is easy

* e.g

$L = \{ \text{binary strings } 2^{\text{nd}} \text{ last is } 1 \}$

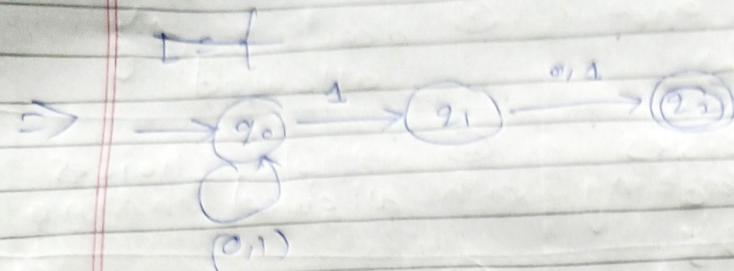
$L = \{ .10, 010, 0110, 00000010, 01010110 \}$



$$L = (0+1)^* (1) (0+1)$$



Converting NFA to DFA



\rightarrow

	0	1
q_0	q_0	(q_0, q_1)
q_1	q_2	q_2
q_2	\emptyset	\emptyset

\rightarrow

	0	1
q_0	q_0	$q_0 q_1$
$q_0 q_1$	$q_0 q_2$	$q_0 q_1 q_2$
$q_0 q_2$	q_0	$q_0 q_1$
$q_0 q_1 q_2$	$q_0 q_2$	$q_0 q_1 q_2$

