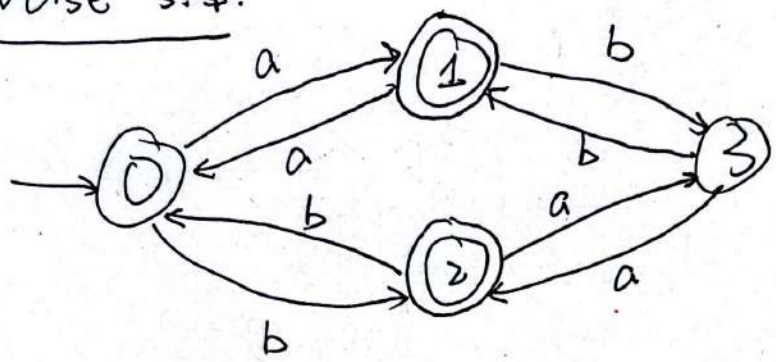
· Exercise 2.4

$L = \{ \varepsilon, a, b, bc, aa, ab, abc, ba, bb, bbc, bca, bcb, \cancel{b} \}$

0 | 1 | 2 | 3 : aaa, aab, aba, abb, baa, bab, bba, bbb

· Exercise 3.1.

(1)



(2) ε ✗ b ✓ abaab ✓ bababbba ✗

(3) $\hat{\delta}_A(0,abba) = \hat{\delta}_A(\delta_A(0,a), bba) = \hat{\delta}_A(1, bba)$

$= \hat{\delta}_A(\delta_A(1,b), ba) = \hat{\delta}_A(3, ba)$

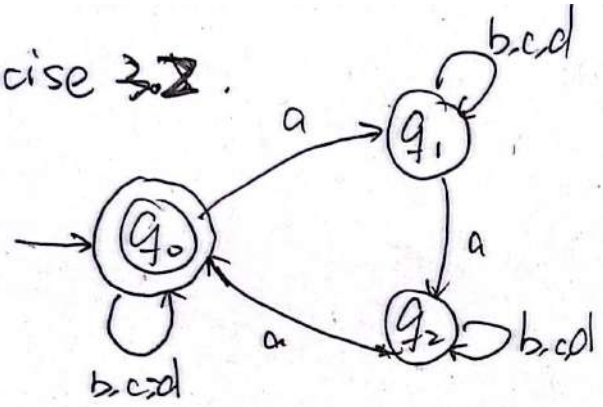
$= \hat{\delta}_A(\delta_A(3,b), a) = \hat{\delta}_A(1, a)$

$= \hat{\delta}_A(\delta_A(1,a), \varepsilon) = \hat{\delta}_A(0, \varepsilon) = 0$

(4) $L(A) = \{w \mid w$ contains only character a or b and is of odd length$\}$

- Exercise 3.8.

B.



$Q = \{q_0, q_1, q_2\}$.

We need 3 states to represent each state of number of "a"s in word.

q_0: #a mod 3 ≡ 0

q_1: #a mod 3 ≡ 1

q_2: #a mod 3 ≡ 2.

· Exercise 3.5

① accepted : abce. not-accepted : d.

② NFA $A = (Q, \Sigma, \delta_A, S, F)$, $S = \{q_0, q_1, q_3\}$.

DFA $D(A) = (P(Q), \Sigma, \delta_{D(A)}, S, F)$.

Transition Table.

$\delta_{D(A)}$	a	b	c
→ * $\{q_0, q_1, q_3\}$	$\{q_0, q_1, q_3\}$	$\{q_0, q_1, q_4\}$	$\{q_0, q_2, q_3\}$
* $\{q_0, q_1, q_4\}$	$\{q_0, q_1, q_3\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$
* $\{q_0, q_2, q_3\}$	$\{q_0, q_1, q_3\}$	$\{q_0, q_4\}$	$\{q_0, q_3\}$
* $\{q_0, q_1\}$	$\{q_0, q_1, q_3\}$	$\{q_0, q_1\}$	$\{q_0, q_2\}$
* $\{q_0, q_2\}$	$\{q_0, q_1, q_3\}$	$\{q_0\}$	$\{q_0\}$
* $\{q_0, q_3\}$	$\{q_0, q_1, q_3\}$	$\{q_0, q_4\}$	$\{q_0, q_3\}$
* $\{q_0, q_4\}$	$\{q_0, q_1, q_3\}$	$\{q_0\}$	$\{q_0\}$
$\{q_0\}$	$\{q_0, q_1, q_3\}$	$\{q_0\}$	$\{q_0\}$

③