| 학번 | 2007037464 | | | 확인 1 | 朴慧暎 | 확인 2 | |
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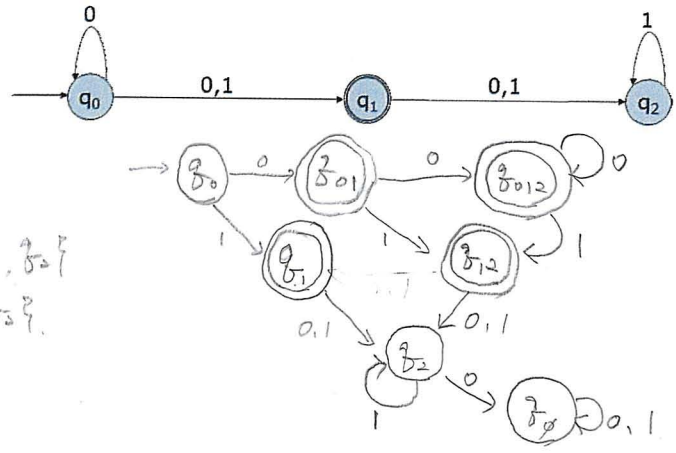
| 이름 | 박 영수 | 분반 | 002 | | | | |

**[Automata 2012 – 2 Homework]**

[Automata Homework #2]

Example2.13] Convert nfa to an equivalent dfa.




$\delta(q_0, 0) = \{q_0, q_1\} = q_{01}$
$\delta(q_0, 1) = \{q_1\}$
$\delta(q_1, 0) = \{q_2\}$
$\delta(q_1, 1) = \{q_2\}$
$\delta(q_2, 0) = \emptyset$
$\delta(q_2, 1) = \{q_2\}$
$\delta(q_{01}, 0) = \{q_0, q_1, q_2\} = q_{012}$
$\delta(q_{01}, 1) = \{q_1, q_2\} = q_{12}$
$\delta(q_{12}, 0) = \{q_2\}$
$\delta(q_{12}, 1) = \{q_2\}$
$\delta(q_{012}, 0) = \{q_0, q_1, q_2\}$
$\delta(q_{012}, 1) = \{q_1, q_2\}$

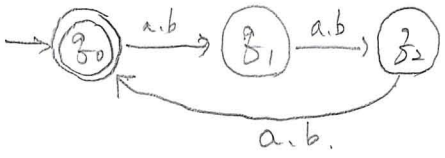



$\therefore M = (\{q_0, q_1, q_2, q_{01}, q_{12}, q_{012}, q_\emptyset\}, \{0,1\}, \delta, q_0, \{q_1, q_{01}, q_{12}, q_{012}\})$

Excercise 2.1.7] Find dfa for the following language on $\Sigma = \{a, b\}$

ok.

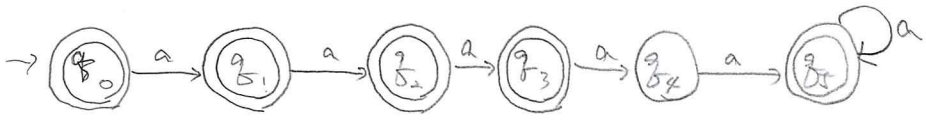
$L = \{w : |w| \bmod 3 = 0\}$




$\therefore M = (\{q_0, q_1, q_2\}, \Sigma, \delta, q_0, \{q_0\})$ ok

| $\delta$ | a | b |
|---|---|---|
| $q_0$ | $q_1$ | $q_1$ |
| $q_1$ | $q_2$ | $q_2$ |
| $q_2$ | $q_0$ | $q_0$ |

Excercise 2.1.13] Show that the language $L = \{a^n : n \geq 0, n \neq 4\}$

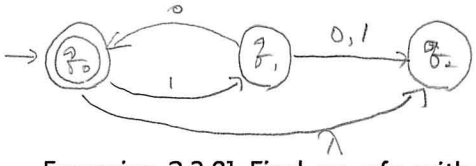



| $\delta$ | a |
|---|---|
| $q_0$ | $q_1$ |
| $q_1$ | $q_2$ |
| $q_2$ | $q_3$ |
| $q_3$ | $q_4$ |
| $q_4$ | $q_5$ |
| $q_5$ | $q_5$ |

$M = (\{q_0, q_1, q_2, q_3, q_4, q_5\}, \{a\}, \delta, q_0, \{q_0, q_1, q_2, q_3, q_5\})$

$\therefore$ language $L$은 DFA로 가지므로 Def 2.3에 따라 regular set good!

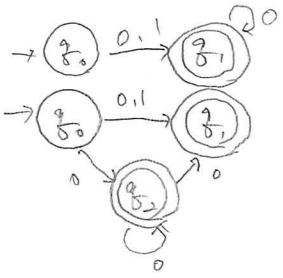
Excercise 2.24] In Figure 2.9, find $\delta^*(q_0, 1011)$ and $\delta^*(q_1, 01)$




$\delta^*(q_0, 1011) = \delta^*(q_1, 011) \cup \delta^*(q_2, 1011) = \delta^*(q_0, 11) \cup \delta^*(q_2, 11)$
$= \delta^*(q_1, 1) = \{q_2\}$
$\delta^*(q_1, 01) = \delta^*(q_0, 1) \cup \delta^*(q_2, 1) = \{q_1\}$

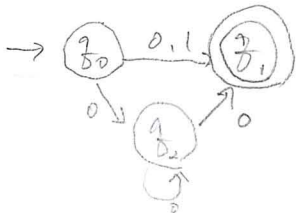
good!

Excercise 2.3.8] Find an nfa without $\lambda$-transition and with a single final state that accepts the set $\{1\} \cup \{0^n | n \geq 1\}$




: 이 경우는 $10^n$을 생성하기 때문에 X good!

: 생성되는 문자는 같으나 문제의 single final state 조건에 위배되므로 X




$\therefore M = (\{q_0, q_1, q_2\}, \{0,1\}, \delta, q_0, \{q_1\})$

| $\delta$ | 0 | 1 |
|---|---|---|
| $q_0$ | $q_1, q_2$ | $q_1$ |
| $q_1$ | $\emptyset$ | $\emptyset$ |
| $q_2$ | $q_1, q_2$ | $\emptyset$ |

| 학번 | 2004105001 | | | 확인 1 | | 확인 2 | |
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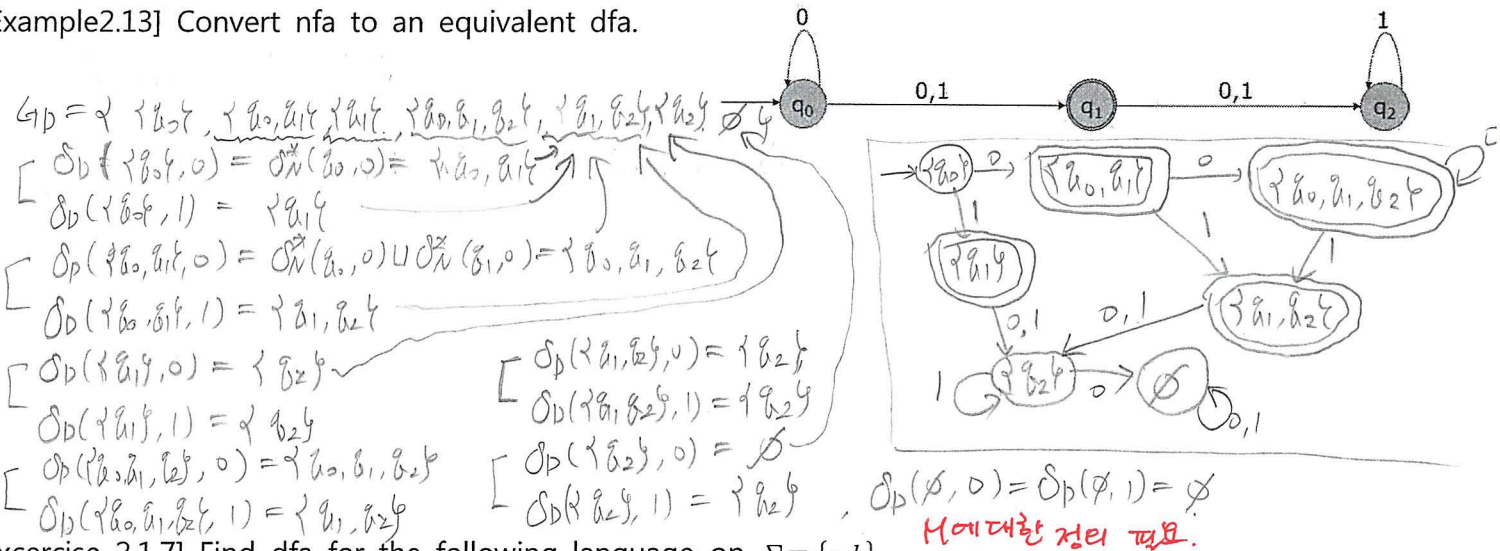
**[Automata 2012 – 2 Homework]**

[Automata Homework #2]

Example2.13] Convert nfa to an equivalent dfa.




$\delta_D(\{q_0\},0) = \delta^*_N(q_0,0) = \{q_0,q_1\}$

$\delta_D(\{q_0\},1) = \{q_1\}$

$\delta_D(\{q_0,q_1\},0) = \delta^*_N(q_0,0) \cup \delta^*_N(q_1,0) = \{q_0,q_1,q_2\}$

$\delta_D(\{q_0,q_1\},1) = \{q_1,q_2\}$

$\delta_D(\{q_1\},0) = \{q_2\}$

$\delta_D(\{q_1\},1) = \{q_2\}$

$\delta_D(\{q_0,q_1,q_2\},0) = \{q_0,q_1,q_2\}$

$\delta_D(\{q_0,q_1,q_2\},1) = \{q_1,q_2\}$

$\delta_D(\{q_1,q_2\},0) = \{q_2\}$

$\delta_D(\{q_1,q_2\},1) = \{q_2\}$

$\delta_D(\{q_2\},0) = \emptyset$

$\delta_D(\{q_2\},1) = \{q_2\}$

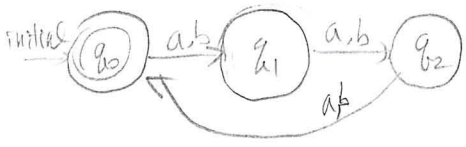
$\delta_D(\emptyset,0) = \delta_D(\emptyset,1) = \emptyset$




Excercise 2.1.7] Find dfa for the following language on $\Sigma = \{a,b\}$

$L = \{w : |w| \bmod 3 = 0\}$

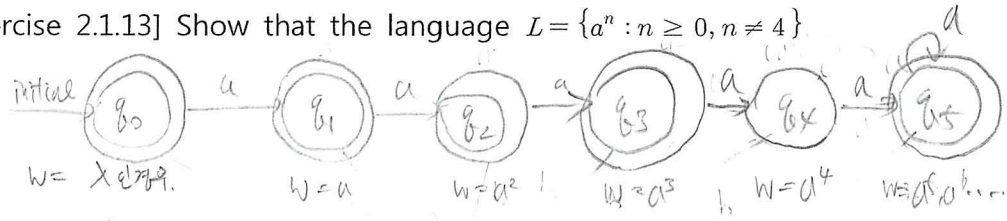
↳ $|w| = 0$ 도 포함된다.




$M = (\{q_0,q_1,q_2\}, \Sigma, \delta, q_0, \{q_0\})$

| $\delta$ | a | b |
|---|---|---|
| $q_0$ | $q_1$ | $q_1$ |
| $q_1$ | $q_2$ | $q_2$ |
| $q_2$ | $q_0$ | $q_0$ |

Excercise 2.1.13] Show that the language $L = \{a^n : n \geq 0, n \neq 4\}$




$M = (\{q_0,q_1,q_2,q_3,q_4,q_5,q_6\}, \{a\}, \delta, q_0, \{q_0,q_1,q_2,q_3,q_5\})$

| $\delta$ | a |
|---|---|
| $q_0$ | $q_1$ |
| $q_1$ | $q_2$ |
| $q_2$ | $q_3$ |
| $q_3$ | $q_4$ |
| $q_4$ | $q_5$ |
| $q_5$ | $q_6$ |
| $q_6$ | $q_6$ |

L을 accept하는 DFS M이 존재한다.

∴ L is regular language ) good!

Excercise 2.24] In Figure 2.9, find $\delta^*(q_0,1011)$ and $\delta^*(q_1,01)$

$\delta^*(q_0,1011) = \{q_2\}$

$\delta^*(q_2,1011) = \emptyset$

$\delta^*(q_1,011) = \emptyset$

$\delta^*(q_0,111) = \{q_2\}$

$\delta^*(q_1,11) = \{q_2\}$

$\delta^*(q_2,11) = \emptyset$

$\delta^*(q_1,01) = \{q_1\}$

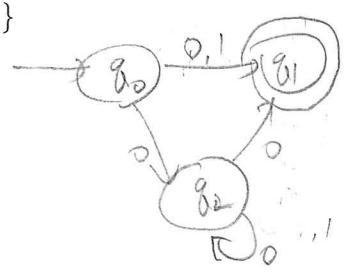
$\delta^*(q_2,1) = \emptyset$

$\delta^*(q_0,1) = \{q_1\}$

$\delta^*(q_1,\lambda) = \{q_1\}$

$\delta^*(q_2,1) = \emptyset$

Excercise 2.3.8] Find an nfa without $\lambda$-transition and with a single final state that accepts the set $\{1\} \cup \{0^n | n \geq 1\}$




$\therefore M = (\{q_0,q_1,q_2\}, \{0,1\}, q_0, \delta, \{q_1\})$

0.1€!

| $\delta$ | 0 | 1 |
|---|---|---|
| $q_0$ | $q_1,q_2$ | $q_1$ |
| $q_1$ | $\emptyset$ | $\emptyset$ |
| $q_2$ | $q_1,q_2$ | $\emptyset$ |

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|---|---|---|---|---|---|---|---|
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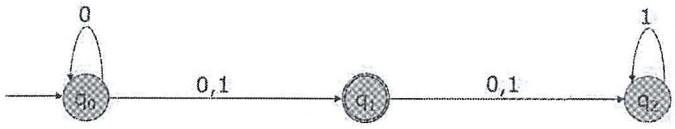
**[Automata 2012 – 2 Homework]**

[Automata Homework #2]

Example2.13] Convert nfa to an equivalent dfa.




$\delta(q_0,0)=\{q_0,q_1\}$, $\delta(q_0,1)=\{q_1\}$

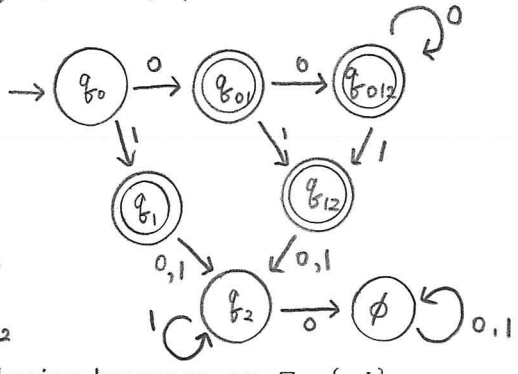
$\delta(q_{01},0)=\delta_N(q_0,0)\cup\delta_N(q_1,0)=\{q_0,q_1,q_2\}$, $\delta(q_{01},1)=\{q_1,q_2\}$

$\delta(q_{012},0)=\{q_0,q_1,q_2\}$, $\delta(q_{012},1)=\{q_1,q_2\}$

$\delta(q_1,0)=\{q_2\}$, $\delta(q_1,1)=\{q_2\}$

$\delta(q_{12},0)=\{q_2\}$, $\delta(q_{12},1)=\{q_2\}$

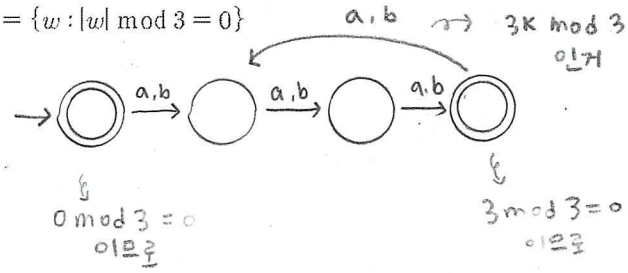
$\delta(q_2,0)=\phi$, $\delta(q_2,1)=q_2$




서에 대한 정의 때문.

Excercise 2.1.7] Find dfa for the following language on $\Sigma=\{a,b\}$

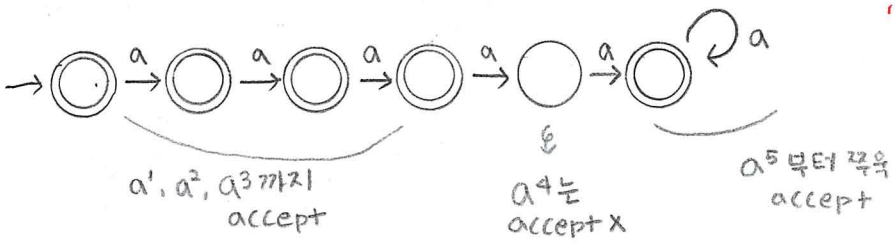
$L=\{w:|w| \bmod 3=0\}$




a,b → 3K mod 3 = 0 (K∈Z⁺) 인거

서에 대한 정의 때문.

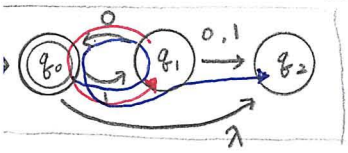
Excercise 2.1.13] Show that the language $L=\{a^n:n\geq 0, n\neq 4\}$



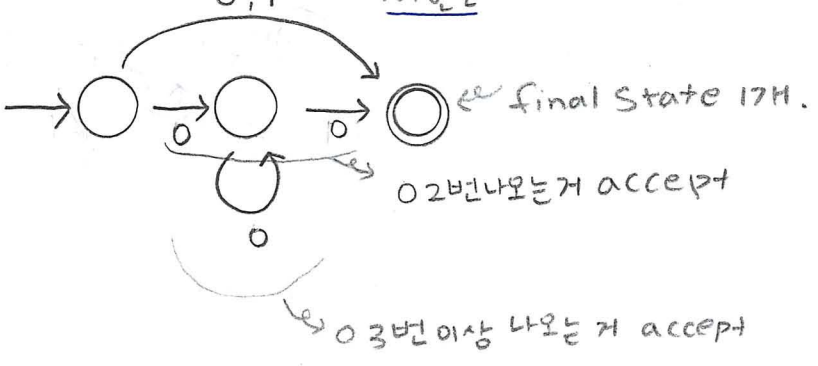

"L을 accept하는 DFA가 존재하므로 L은 regular"

Excercise 2.24] In Figure 2.9, find $\delta^*(q_0,1011)$ and $\delta^*(q_1,01)$

$=\{q_2\}$ $=\{q_1,q_2\}$




Excercise 2.3.8] Find an nfa without $\lambda$-transition and with a single final state that accepts the set $\{1\}\cup\{0^n|n\geq 1\}$




0이 한번 1이 한번 나오는거 accept

서에 대한 정의 때문.

02번나오는거 accept

03번이상 나오는 거 accept