2019-1, 2019/4/5

오토마타 및 형식언어(COMP315)

Homework 2

Due date: 2019년 4월 ~~19~~ 18일

Late submission: 10% deduction per day

How to submit: Upload the answers as one PDF file to LMS

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Q1, 5점) Chapter 3.1, Exercise 20 (pg. 79)

For $\Sigma = \{1,0\}$, 다음 조건을 만족하는 문자열의 regular expression을 구하세요:

(a) all strings that end with 10 (10으로 끝나는 모든 문자열)

r = $(1+0)^*10$

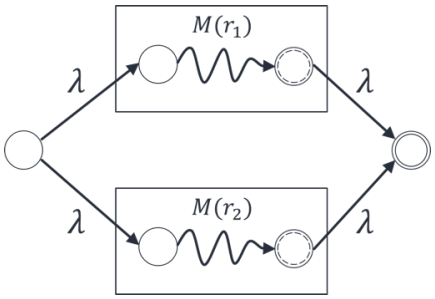
(b) all strings that does not end with 10 (10으로 끝나지 않는 모든 문자열)

r = $(1+0)^*(11+01+10)\ +1\ +0\ +\lambda$

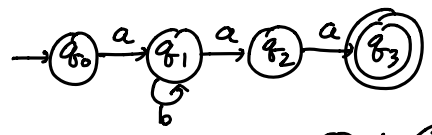
Q2, 5점) Chapter 3.2, Exercise 3 (pg. 89)

Theorem 3.1을 활용하여 언어 $L(ab^*aa + bba^*ab)$을 수용(accept)하는 NFA를 구하세요

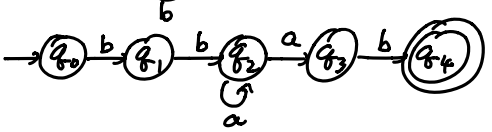
Hint: Use theorem 3.1 for $r_1 + r_2$



$r_1 = ab^*aa$. $M(r_1)$:

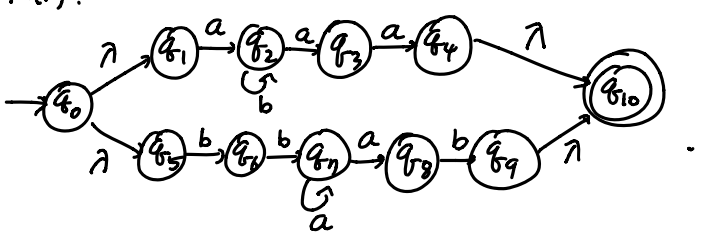


$r_2 = bba^*ab$. $M(r_2)$:



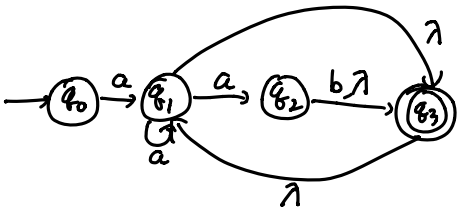
$\therefore r = r_1 + r_2$,

$M(r)$:



Q3, 5점) Chapter 3.3, Exercise 3 (pg. 99)

언어 $L = (aa^*(ab + a)^*)$을 위한 regular grammar를 구하세요. (Production rule을 사용하세요)



$G = (V, T, S, P)$.

$V = \{q_0, q_1, q_2, q_3\}$. $T = \{a, b\}$.

$S = q_0$.

$P = \{ q_0 \to aq_1$

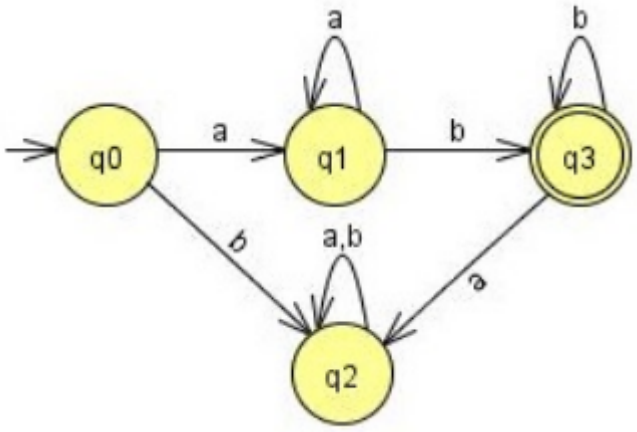
$q_1 \to aq_1 | aq_2 | q_3$

$q_2 \to bq_3 | q_3$

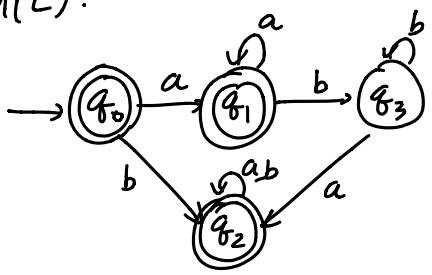
$q_3 \to q_1 | \lambda \}$.

Q4, 5점) Chapter 4.1, Exercise 1 (pg. 111)

$\Sigma = \{a, b\}$, $L = L(aa^*bb^*)$ 언어의 DFA는 아래와 같다.



$M(\bar{L})$:



* $\bar{L} = L(a^* + (aa^*bb^*a + b)(a+b)^*)$.

이때 $\bar{L}$에 해당하는 DFA를 구하세요.

* 보너스 점수 3점. $\bar{L}$의 regular expression을 구하세요.