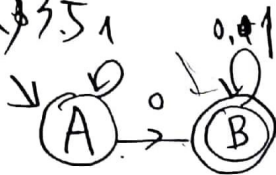


9/28 (Wed) 제 10강 $FA \rightarrow RE2$, Chap 4.1 Pumping Lemma

Ex) 3.5.1

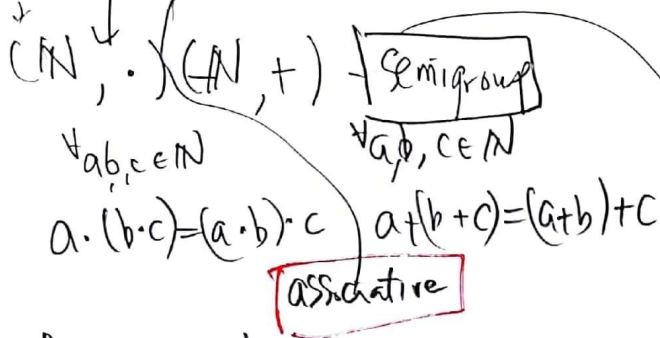


$$\begin{cases} \delta(A, 1) = A & \delta(A, 0) = B \\ \delta(A, 0) = B & \delta(B, 1) = B \end{cases} \quad F = \{B\}$$

$$\begin{aligned} A &= 1A + 0B & A &\Rightarrow 1A \Rightarrow 11A \Rightarrow \dots \Rightarrow 1^k A \Rightarrow 1^k B \\ B &= 0B + 1B + \epsilon & B &\Rightarrow (0+1)B + \epsilon \Rightarrow (0+1)^k \epsilon \end{aligned}$$

monoid (T^*, \cdot, ϵ) - FLT.

monoid $(N, +, 1)$ 자연수



Concatenation \cdot for T^*
 identity (ϵ) for T^*
 zero for $+$
 identity for $+$

algebraic system

$(N, +)$ closed, (N, \cdot) 닫혀있지 않음

$$\forall a, b \in N \quad a \cdot b \in N \quad | \quad a + b \in N$$

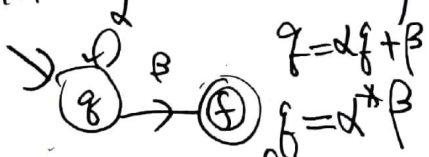
* 컴퓨터 기어 자연수 (정수; int)는 닫혀있지 않다!
 (자연수는 무한하다)
 단항연산에 $\frac{0}{1}$ 32bit, 64bit

algebraic system 닫혀있지 않음 for 연산 (operation)

semigroup
monoid

associative for \circ
identity

$$\begin{aligned} & (N, +), (N, \cdot), (T^*, \cdot) \\ & \oplus: N \times N \rightarrow N \\ & \sum_{i=1}^n \lambda_i = + \lambda \end{aligned}$$



$$\begin{aligned} q &= \alpha q + \beta \\ q &\Rightarrow \alpha q \Rightarrow \alpha^2 q \Rightarrow \dots \Rightarrow \alpha^k q \Rightarrow \alpha^k \beta \end{aligned}$$

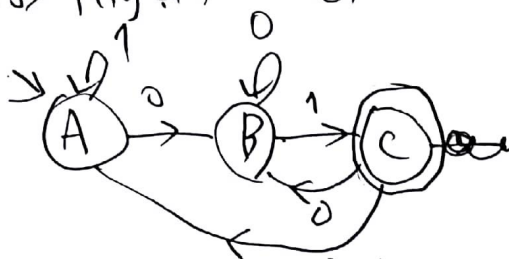


$$q \Rightarrow \alpha^k q \Rightarrow \alpha^k \beta \Rightarrow \alpha^m \beta \Rightarrow \alpha^n \beta$$

계산 방법: binary-op
 \Rightarrow n-ary-op

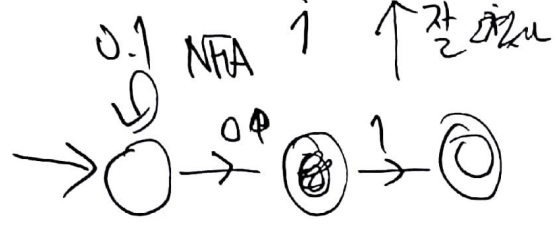
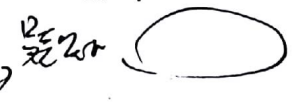
P63 Fig 2.14 DFA

regular grammar



$$\begin{cases} A = 0B + 1A \\ B = 0B + 1C \\ C = 0B + 1A + \epsilon \end{cases}$$

S1



$$A = (0+1)A + 0B = (0+1)A + 0B$$

$$B = 1C$$

$$C = \epsilon$$

$(0+1)^*$ 이 S2

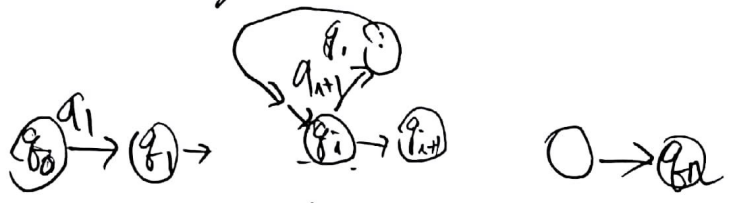
Chap 4. 정규 언어의 생성

4.1. Pumping Lemma — 어떤 언어가 정규 언어인지 증명하는 법!

$$L = \{0^n 1^n \mid n \geq 0\} \rightarrow \text{infinite state! } \neq L(0^* 1^*)$$

regular 가 아니다 (X) —

*은 수를 못 센다.
*는 0 이상 많다!



n-states q_1, \dots, q_m $m > n$

같은 state를 두번(이상) 방문

Pumping lemma는 처음 TP를 잘 읽어보시오

의 의미는 *로 바꿀 수 없음

정규 언어는 무한 집합은

즉 $0^n 1^n$ 이 아닌

$$\boxed{m \geq 0}$$

$$0^n 1^m \text{ 이 어떤지 } n, m \geq 0$$