제 5강 3/15(木) 1.2 Languages. 1.6 Rewriting Systems

algebraic system (A, ·) · is closed : $A \times A \to A$ (binary operation)

Ex) ($\mathbb{N}$, +) $\mathbb{N}$ is infinite   computer integer is not closed!

pseudo real, pseudo integer

error bound

오차의 범위 < 절대오차 +, − / 상대오차 ×, ÷.

semi-group (A, ∘)   binary operation

① algebraic system (= · is closed)

② · is associative. $\forall a,b,c \in A \ (a \circ b) \cdot c = a \circ (b \cdot c)$

· is n-ary operation

Ex) ($\mathbb{N}$, +) $\sum_{i=1}^{n} a_i$

③ identity $\forall a \in A, \exists e \in A \ a \circ e = e \cdot a = a$ e : identity

Ex) ($\mathbb{N}$, +, 0) ($\mathbb{N}$, ×, 1) is a monoid.

(M, ∘, e) is ~~an~~ a monoid

Fact 1.12 − HW #2 proove Fact 1.12 Due 3/22(木) 오후 1:00

$$\begin{cases} x^0 \triangleq e \\ x^n \triangleq x \cdot x^{n-1} \quad (n \geq 1;\ n > 0) \end{cases}$$

concatenation operator ·

Formal Language Theory

Terminologies

Noun	set
$a \in V$ (symbol)	V (Vocabulary / alphabet) .. set of symbol
$x \in V^*$ (string) 文字열	V^* (Universe of strings) $L \subseteq V^*$ (language)

sequence-ing

$\varepsilon \notin V$

$\forall a \in V$

$|a| = 1$

※ $\varepsilon \in V^0 \subseteq V^*$ emptystring.

한글 Voc. V

V = {ㄱ, ㄴ, .. ㅎ, 14

ㅏ, ㅑ, .. ㅣ, 10

ㄲ, ㄸ, ㅃ, ㅆ, ㅉ} 5

29

(V^*, ·, ε) is a free monoid

가ㄱㄱㄱㅗ < 갂꼬 / 갃고

2) 1.6 Rewriting Systems

$G=(V,P)$ is a rewriting system (or Semi Thue System)

V : vocabulary

$P \subseteq V^* \times V^*$

$\alpha,\beta \in V^*$ $(\alpha,\beta) \in P$ or written $\alpha \to \beta \in P$

$\eta = \gamma\alpha\delta \underset{G}{\overset{\alpha\Rightarrow\beta}{\Longrightarrow}} \gamma\beta\delta \quad \forall \gamma,\delta \in V^*$

η (directly) derive $\gamma\beta\delta$.

$\eta_1 \Rightarrow \eta_2 \Rightarrow \eta_3 \Rightarrow \cdots \Longrightarrow \eta_n$

$\eta_1 \Rightarrow^n \eta_n$ or $\eta \Rightarrow^* \eta_n$

or $\eta \overset{\pi}{\Rightarrow} \xi$ where $\eta,\xi \in V^*$, $\pi \in P^*$