1/

4/4 (화) 3.2 Finite Automata

language description
- description power — 표현력
- succintness — 간결정도

※ ambiguous.

regular expression
automata (pda)
grammar [reg, cf, g] → rewriting system

번역의 원리
— 오양인
기획재
16,000

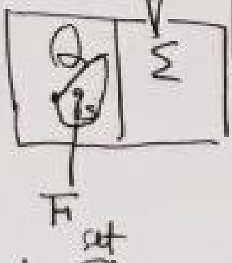
Def. Finite Automata

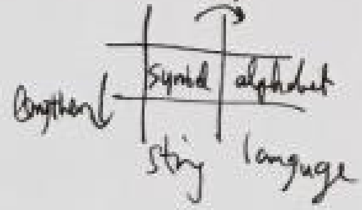
Let $M = (V, P)$ be a rewriting system.

$V = Q \cup \Sigma$, $Q \cap \Sigma = \phi$. $q_s \in Q$, $F \subseteq Q$

$M = (Q, \Sigma, P, q_s, F)$ → set of final states.

- Q: state alphabet (= vocabulary)
- Σ: input symbol alphabet
- P: rules
- q_s: initial state





P: rules $qx \to p \in P$

$p, q \in Q$, $x \in \Sigma^*$.

$x \in \Sigma^*$ $\quad (q) \xrightarrow{x} (p)$

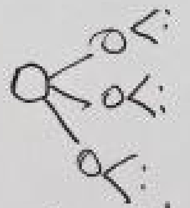
i) $|x| = 0$, $x = 0$ $\quad p \in \delta(q, \varepsilon)$ — ε-move

ii) $|x| = 1$ $\quad x = a \in \Sigma$ $\quad p \in \delta(q, a)$ — normal form in this text.

iii) $|x| \geq 2$ $\quad x \in \Sigma^{\geq 2}$ $\quad p \in \delta(q, x)$ — Def of Reg. lang in Aho & Ullman's Book

configuration $\quad (q, x) \in Q \times \Sigma^*$ $\quad qx \in Q\Sigma^*$

$(q_0, x_1 x_2 \cdots x_n) \overset{q_0 x_1 \to q_1}{\Rightarrow} (q_1, x_2 \cdots x_n) \Rightarrow \cdots \Rightarrow (q_n, \varepsilon)$ < $q_n \in F$ / $q_n \notin F$



rewritings / computations / processes (Decision Tree)

non-deterministic

What vs How
무엇, 어떻게

$L(M) = \{ x \in \Sigma^* \mid q_s x \Rightarrow^* f, f \in F \}$

fa → normalform fa → ε-free (normal form) fa

$O(n)$ $\quad O(n^2)$

Thm 3.14 $\quad$ empty_trans (R) $\subseteq Q \times Q$ $\quad$ empty_trans* (R^*) $\subseteq Q \times Q$

depth-first / breadth-first → search