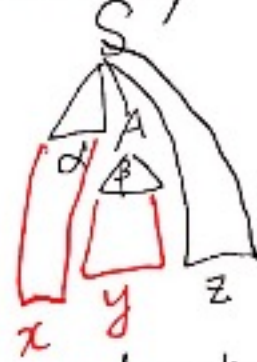
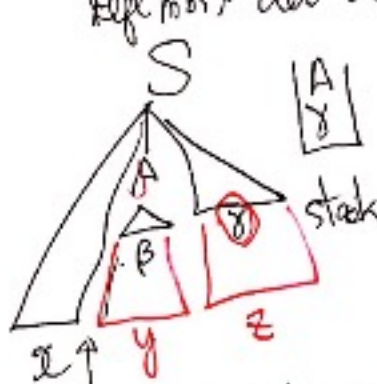
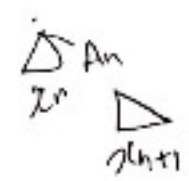
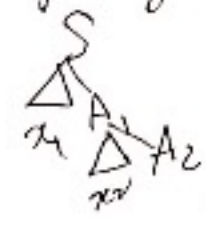


Regular Language vs Context-free Language

Linear structure \rightarrow list (skewed tree) vs hierarchical structure (tree)

single rightmost nonterminal if any!

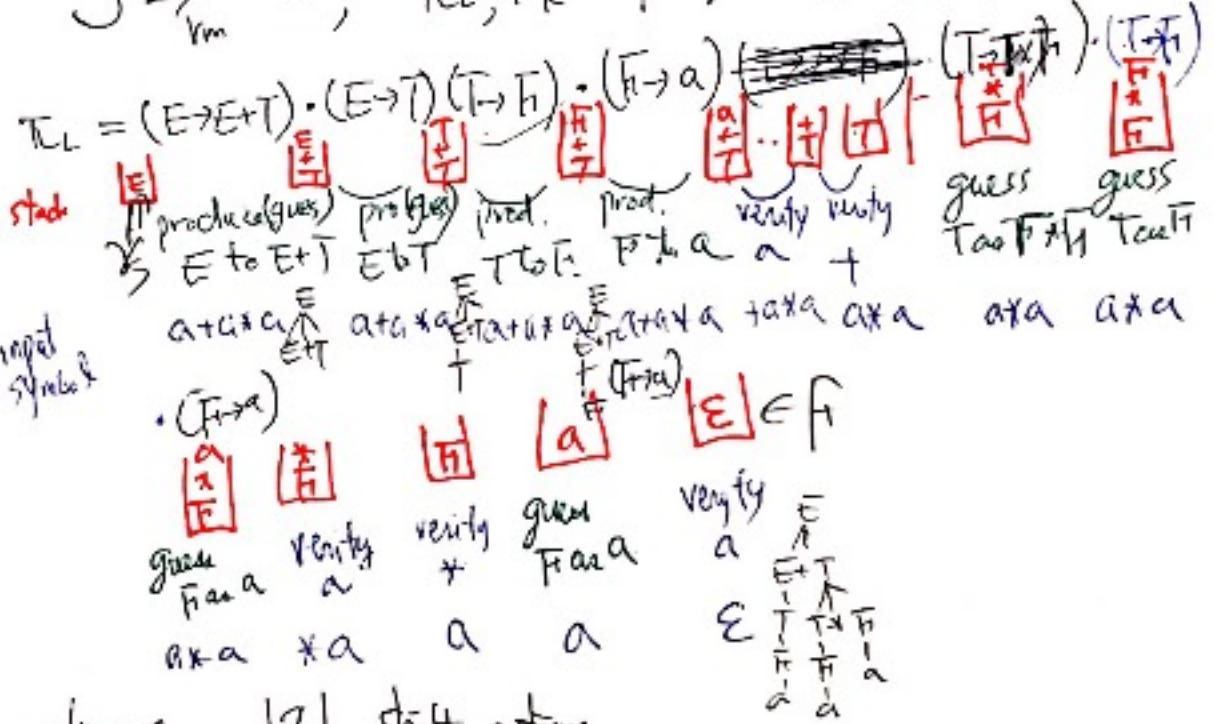
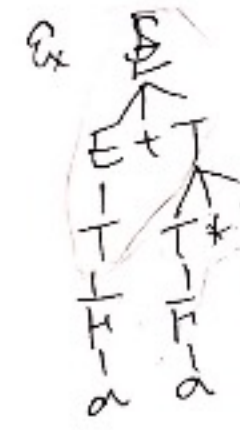
many nonterminals!
leftmost derivation vs rightmost der.



stack

sentence가 xyz derivation $S \Rightarrow^*$ xyz
 parse tree \Leftarrow xyz

$$S \xRightarrow[lm]{\pi_L} \alpha \quad S \xRightarrow[r]{\pi_R} \alpha, \quad \pi_L, \pi_R \in P, \quad |\pi_L| = |\pi_R|$$



$$S \xRightarrow[lm]{\pi_L} \alpha$$

$|\pi_L|$ guess actions $|x|$ shift actions

Non-deterministic linear parser

Left parser =
 1 LL(k) (deterministic) Parser
 2 LR(k) " " Parser
 strong.

Chap. 5 Parsing

Parser - 문장 검사기

- 문장을 파는 4부분 바둑의 주는 기계!

↳ left parse (Π_L) \leftrightarrow 파는 4부 parse tree (in normal order!)

Left Parse = Leftmost derivation (in normal order!)
 Right Parse = Rightmost derivation (in reversed order!)

Pushdown Automaton - (a) -

$M = (N \cup \Sigma \cup \{ \$ \}, \Gamma)$ is a rewriting system. $G = (N, \Sigma, P, S)$

Left Parser $L = (N, \Sigma, P, \gamma_s, F, \$, |)$

(1) $N \cup \Sigma$... stack alphabet
 where $N \cap \Sigma = \emptyset$

(2) Σ ... input alphabet

(4) $\gamma_s \in (N \cup \Sigma)^*$... initial stack content

(5) $F \subseteq (N \cup \Sigma)^*$... a set of final stack contents $F = \{ \epsilon \}$ in " non-deterministic Left Parse

(6) $\$$... endmarker $\$ \notin N \cup \Sigma$

(7) $|$... delimiter between stack string and remained input string.

(8) Γ ... a set of actions separated by \rightarrow
 action $\alpha \in \Gamma$. a pair of configuration strings

$\alpha = (\alpha | xy) \rightarrow (\beta | y) \in \Gamma$
 separated by $|$
 (stack string, (remained) input string)

$\alpha, \beta \in (N \cup \Sigma)^*$, $x, y \in \Sigma^*$

unreadable but stack

a set of actions for left parser of a

(1) $A | x \rightarrow \alpha^R | x \in \Gamma$ if $A \rightarrow \alpha \in P$

(2) $a | a \rightarrow | \in \Gamma$ if $a \in \Sigma$

cfg $G = (N, \Sigma, P, S)$
 guess A as α ($A \rightarrow \alpha \in P$)
 verify a ($a \in \Sigma$)

$x \in \Sigma^*$, $|x| \leq k$... such parser

Left parser
 Nondeterministic

input string is consuming only!
 (read only, no write)

