5/17 - 5강 LR(k) parsing - a LR(k) state 와 LR(k) items

5/24(목) 12강

Thm 6.7 Viable prefix = Viable stack string

$= $ a set of (canonically collected) LR(k) items

Def. Give $G=(N,\Sigma,P,S)$, G_{VP} =

rule automaton over $N \cup \Sigma$

= LR(0) machine over $N \cup \Sigma$ with stack

= Characteristic Finite state Machine

Thm 6.4. Viable prefix $= L(G_{VP})$ = A_{VP}

6.2 LR(k) items

Let $A \to \alpha\beta \in P$. Then $[\underbrace{A\to\alpha.\beta}_{\text{position core}}, \underbrace{y}_{\text{lookahead}}]$ is a k-item. $y \in \Sigma^{\le k}$ or $k:(\Sigma^* \$^k)$

$[A\to\alpha.\beta, y]$ is a valid LR(k) item, if (shift on Σ, reduce, Goto on N (= pop and Goto))

$$S \overset{*}{\underset{rm}{\Rightarrow}} \gamma A z \underset{rm}{\Rightarrow} \gamma\alpha\beta z (= \delta\beta z), \text{ and } y = k:z.$$

Let $G=(N,\Sigma,P,S)$ be a cfg. Then augmented grammar G' $= (N\cup\{S'\}, \Sigma, P, S\cup\{S'\to S\})$ where $S'\notin N$.

LR(0)G $\supseteq$ SLR(1)G $\supseteq$ LALR(1)G $\supseteq$ LR(1) G

no lookahead for reduce LR(0) state

for reduce $A\to\alpha.$ LR(0) state lookahead Follow(A)

LR(0) state LR(1) lookahead

for reduce $[A\to\alpha., a]$ reduce on a

LR(0) item $|G| = \sum_{A\to\alpha\in P} |A|+|\alpha| = \sum_{A\to\alpha\in P} |\alpha|+1$ LR(0) state $2^{|G|}$

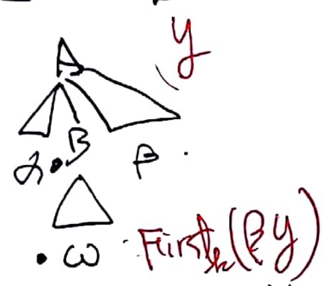
LR(1) item $|G|\cdot(\Sigma+1)$ LR(1) state $2^{|G|(|\Sigma|+1)}$

LR(k) item $|G|\cdot(\Sigma^k+\Sigma^{k-1}+\cdots+\Sigma^0)$ LR(k) 〃 $2^{|G|\cdots}$

$\frac{|\Sigma|^{k+1}-1}{|\Sigma|-1}$

시작은 $[S'\to .S, \varepsilon]$ or $[S'\to .S, \$^k]$

$[A\to\alpha.B\beta, y] \ \partial_k \ [B\to .\omega, z]$ where $B\to\omega\in P$, $z\in First_k(\beta y)$ in p.24



∂_k 에 관하여는 position 나 lookahead가 바뀌고 의 사실은 바뀌지 않았나 in p.26

χ_k $[A\to\alpha.X\beta, y] \ \chi_k^X \ [A\to\alpha X.\beta, y]$

χ_k^X 에 관하여는 position이 바뀌고 lookahead는 안바뀐다

See algorithm $M=(C_k, V, P, q_0, \phi)$ in page 27