Parsing Beyond CFG
Earley Parsing for TIG: Example

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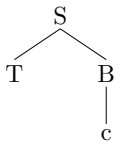
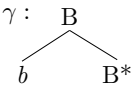
α :



β :

γ :



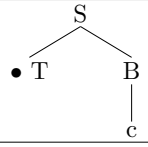
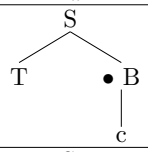
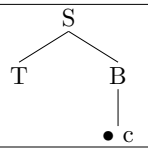
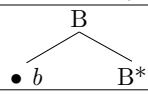
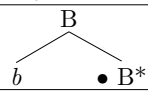
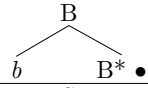
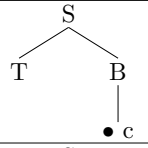
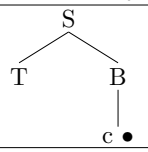
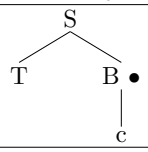
The grammar:

$\langle \alpha^1_S \to \alpha^2_T \alpha^3_B,$
$\alpha^3_B \to \alpha^4_c,$
$\text{Subst}(\alpha^2_T),$
$\text{Init}(\alpha^1_S) \rangle$

$\langle \beta^1_T \to \beta^2_a,$
$\text{Init}(\beta^1_T) \rangle$

$\langle \gamma^1_B \to \gamma^2_b \gamma^3_B,$
$\text{Foot}(\gamma^3_B),$
$\text{LeftAux}(\gamma^1_B) \rangle$

Input word: *abc*

	Item	dotted tree	rule
1.	$[\alpha^1_S \to \bullet \alpha^2_T \alpha^3_B, 0, 0]$		Initialize
2.	$[\beta^1_T \to \bullet \beta^2_a, 0, 0]$		PredictSubst from 1
3.	$[\beta^1_T \to \beta^2_a \bullet, 0, 1]$		Scan from 2
4.	$[\alpha^1_S \to \alpha^2_T \bullet \alpha^3_B, 0, 1]$		Substitute from 3, 1
5.	$[\alpha^3_B \to \bullet \alpha^4_c, 1, 1]$		MoveDown from 4.
6.	$[\gamma^1_B \to \bullet \gamma^2_b \gamma^3_B, 1, 1]$		PredictLeftAdjunction from 5.
7.	$[\gamma^1_B \to \gamma^2_b \bullet \gamma^3_B, 1, 2]$		Scan from 6.
8.	$[\gamma^1_B \to \gamma^2_b \gamma^3_B \bullet, 1, 2]$		ScanFoot from 7.
9.	$[\alpha^3_B \to \bullet \alpha^4_c, 1, 2]$		LeftAdjunction from 9, 5.
10.	$[\alpha^3_B \to \alpha^4_c \bullet, 1, 3]$		Scan from 9.
11.	$[\alpha^1_S \to \alpha^2_T \alpha^3_B \bullet, 0, 3]$		Complete node from 11, 4.

Initialization: $\dfrac{}{[\mu_S \rightarrow \bullet\alpha, 0, 0]}$

PredictLeftAdjunction: $\dfrac{[\mu_A \rightarrow \bullet\alpha, i, j]}{[\rho_A \rightarrow \bullet\gamma, j, j]}$ $LeftAux(\rho_A)$, $Adjoin(\rho_A, \mu_A)$

LeftAdjunction: $\dfrac{[\mu_A \rightarrow \bullet\alpha, i, j][\rho_A \rightarrow \gamma\bullet, j, k]}{[\mu_A \rightarrow \bullet\alpha, i, k]}$ $LeftAux(\rho_A)$, $Adjoin(\rho_A, \mu_A)$

PredictRightAdjunction: $\dfrac{[\mu_A \rightarrow \alpha\bullet, i, j]}{[\rho_A \rightarrow \bullet\gamma, j, j]}$ $RightAux(\rho_A)$, $Adjoin(\rho_A, \mu_A)$

Scan: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_a\beta, i, j]}{[\mu_A \rightarrow \alpha v_a \bullet \beta, i, j+1]}$ $a = a_{j+1}$

EpsScan: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_a\beta, i, j]}{[\mu_A \rightarrow \alpha v_a \bullet \beta, i, j]}$ $a = \epsilon$

ScanFoot: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_B\beta, i, j]}{[\mu_A \rightarrow \alpha v_B \bullet \beta, i, j]}$ $Foot(v_B)$

RightAdjunction: $\dfrac{[\mu_A \rightarrow \alpha\bullet, i, j][\rho_A \rightarrow \gamma\bullet, j, k]}{[\mu_A \rightarrow \alpha\bullet, i, k]}$ $RightAux(\rho_A)$, $Adjoin(\rho_A, \mu_A)$

PredictSubst: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_B\beta, i, j]}{[\rho_B \rightarrow \bullet\gamma, j, j]}$ $Subst(v_B)$, $Init(\rho_B)$

Substitute: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_B\beta, i, j][\rho_B \rightarrow \gamma\bullet, j, k]}{[\mu_A \rightarrow \alpha v_B \bullet \beta, i, k]}$ $Subst(v_B)$, $Init(\rho_B)$

MoveDown: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_B\beta, i, j]}{[v_B \rightarrow \bullet\gamma, j, j]}$

CompleteNode: $\dfrac{[\mu_A \rightarrow \alpha \bullet v_B\beta, i, j][v_B \rightarrow \gamma\bullet, j, k]}{[\mu_A \rightarrow \alpha v_B \bullet \beta, i, k]}$

Goal Item: $[\mu_S \rightarrow \alpha\bullet, 0, n], Init(\mu_S)$