

7/11/21 4/14(21) Left/Right Parsers.

Let  $G = (N, \Sigma, P, S)$  be a cfg.  
 Left parser  $M = (N \cup \Sigma, P, P, \{S\}, \{\epsilon\})$

$\forall A \rightarrow \alpha \in P: A | \rightarrow \alpha R | \in P' \quad \tau(A \rightarrow \alpha R) = A \rightarrow \alpha$   
 $\forall a \in \Sigma: a | a \rightarrow | \in P \quad \tau(a/a) = \epsilon$

$S \Rightarrow_{lm}^{\pi} W$  iff  $\$ S | \Rightarrow_{lm}^{\pi} \$ | W$ ,  $\pi \in P^*, \theta \in P^*$   
 where  $\tau(\theta) = \pi$   $|\pi| + |w| = |\theta|$



deterministic

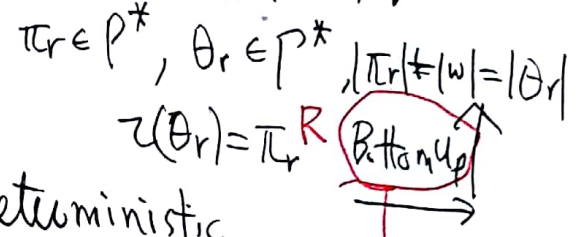
LL(k) Parser  
 (Left-to-right Scan  
 with Leftmost derivation  
 in (in Normal Order)  
 using (k) lookahead symbols

RL(k)

Right parser  $M = (N \cup \Sigma, P, P, \{S\}, \{\epsilon\})$

$\forall a \in \Sigma: | a \rightarrow a | \in P \quad \tau(| a \rightarrow a) = \epsilon$   
 $\alpha | \rightarrow A | \in P' \quad \tau(\alpha | \rightarrow A) = A \rightarrow \alpha$

$S \Rightarrow_{rm}^{\pi} W$  iff  $\$ | W \Rightarrow_{rm}^{\pi} \$ S |$ ,  $\pi \in P^*, \theta \in P^*$   
 where  $\tau(\theta) = \pi^R$   
 $|\pi| + |w| = |\theta|$



deterministic

LR(k) Parser  
 (Left-to-right Scan  
 in Rightmost derivation  
 in Reversed Order  
 using (k) lookahead symbols

RR(k)