

# 1/10 (Thu) Rewriting System & FA, grammars, and PDA.

PDA  $\delta: Q \times (\Sigma \cup \{\epsilon\}) \times \Gamma \rightarrow Q \times \Gamma^*$

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(?)

↓ restriction  
↓ ext.

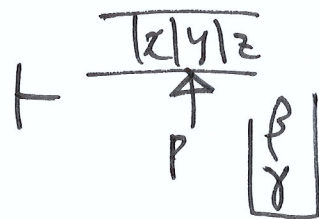
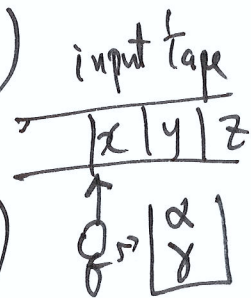
$\delta: Q \times (\Sigma \cup \{\epsilon\}) \times \Gamma \rightarrow Q \times (\Sigma \cup \Gamma \cup \Gamma^2)$

ext.  $\delta: Q \times \Sigma^* \times \Gamma^* \rightarrow Q \times \Sigma^* \times \Gamma^*$

$\delta \subseteq (Q \times \Sigma^* \times \Gamma^*) \times (Q \times \Sigma^* \times \Gamma^*)$

If  $(p, y, \beta) \in \delta(q, xy, \alpha)$

$(q, xyz, \alpha\gamma) \vdash (p, yz, \beta\gamma)$



Instantaneous Description (ID) of PDA  
Configuration of PDA

$Q \times \Sigma^* \times \Gamma^*$

Rewriting System.  $(A, P)$

A ... a set of symbol.

$P \subseteq A^* \times A^*$  if  $(\alpha, \beta) \in P$ ,  $\alpha \rightarrow \beta \in P$  we may write

Derivation of rules

$\gamma \alpha \delta \Rightarrow \gamma \beta \delta$   
 $\Rightarrow \subseteq A^* \times A^*$

ID of FA  $Q \times \Sigma^*$

ID " PDA  $Q \times \Gamma^* \times \Sigma^*$

ID of grammar  $(V \cup T)^*$

parse tree reg.

afa

ID of reg. grammar

$(V \cup \{\epsilon\})^*$   $LA \rightarrow \alpha B$   
or  $A \rightarrow \alpha$   
where  $A, B \in V$   
 $\alpha \in T^*$

list linear

tree hierarchical

Left parser  $\Rightarrow$  guess-verify parser  $\Leftarrow$  Right parser