

5/15 - 77% Chap 6 LR(k) Parsing

6.1 Viable Prefixes - valid stack string

$G_{ab}: S \rightarrow aA \mid bB$

$A \rightarrow c \mid dAd$

$B \rightarrow c \mid dBd$ ^{TOP}

$L(G_{ab}) = \{a, b\} \{d^n c d^n \mid n \geq 0\}$

$\$ \alpha c \mid y \$$ where $\alpha \in \{a, b, d\}^*$ $l = y \$ \in \{d, \$\}^*$

lookback lookahead ~~TOP~~ reduce

$\$ \gamma \mid x y \$ \Rightarrow^* \$ \gamma \mid y \$ \Rightarrow^* \$ \gamma \$ \mid \$$

initial conf.

γ : viable prefix final or viable stack string

Viable prefixes for G_{ab} : ex $adcd$



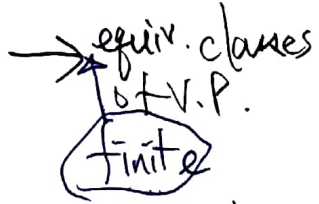
$\$ a \mid \$ \Rightarrow \$ ad \mid \$ \Rightarrow \dots \$ ad \dots d$

$\$ \mid addcd \$ \Rightarrow \$ a \mid dcd \$ \Rightarrow \$ ad \mid dcd \$$

$\Rightarrow \$ add \mid cd \$ \Rightarrow \$ addc \mid d \$ \xrightarrow[\text{reduce } A \rightarrow c]{\text{reduce } A \rightarrow c} \$ addA \mid d \$ \Rightarrow \$ addAd \mid \$$

$\xrightarrow[\text{reduce } dAd \rightarrow A]{\text{reduce } dAd \rightarrow A} \$ adA \mid \$ \Rightarrow \$ adA \mid \$ \xrightarrow[\text{reduce } dAd \rightarrow A]{\text{reduce } dAd \rightarrow A} \$ aA \mid \$ \xrightarrow[\text{reduce } aA \rightarrow S]{\text{reduce } aA \rightarrow S} \$ S \mid \$$

viable prefixes (strings) infinite



$2^{|Z|+|P|}$ equiv. classes

$\$ [\epsilon] \mid addcd \$ \Rightarrow [ad^* \mid bd^*] \mid ddcd \$ \xrightarrow[\text{reduce } A \rightarrow c]{\text{reduce } A \rightarrow c} [ad^* \mid bd^*] [ad^* \mid bd^*] \mid dcd \$$

$\Rightarrow \$ [\epsilon] \mid addcd \$ \Rightarrow \$ [\epsilon] [a] \mid dcd \$ \Rightarrow \$ [\epsilon] [a] [ad] \mid dcd \$$

$\Rightarrow \$ [\epsilon] [a] [aa] [add] \mid ccd \$ \Rightarrow \$ [\epsilon] [a] [ad] [add] [addc] \mid dd \$$

$\xrightarrow[\text{reduce } c \rightarrow A]{\text{reduce } c \rightarrow A} \$ [\epsilon] [a] [ad] [add] [addA] \mid dd \$ \xrightarrow[\text{reduce } dAd \rightarrow A]{\text{reduce } dAd \rightarrow A} \$ [\epsilon] [a] [ad] [addA] [addAd] \mid dd \$$

$\xrightarrow[\text{reduce } dAd \rightarrow A]{\text{reduce } dAd \rightarrow A} \$ [\epsilon] [a] [ad] [adA] \mid \$$