Syntax Analysis

Sudakshina Dutta

IIT Goa
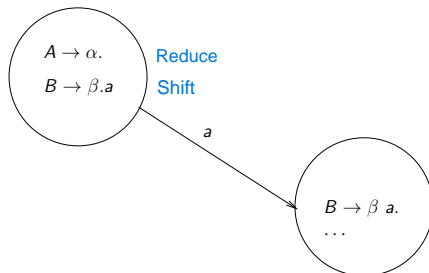
25th March, 2022

LALR parsing techniques

- ▶ The LR(1) items are constructed in the same way
- ▶ The item with the same core are merged
- ▶ The method is often used in practice as the table is considerably smaller than CLR(1)
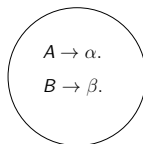- ▶ The size of the goto graph is the same as LR(0) automaton

Shift-reduce conflicts in LR(0) items

SLR

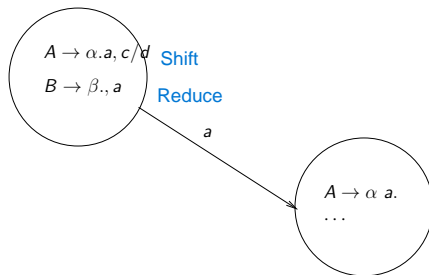
If $a \in FOLLOW(A)$
, then shift-reduce conflict happens

Reduce-reduce conflicts in LR(0) items

$$A \rightarrow \alpha.$$
$$B \rightarrow \beta.$$

If $FOLLOW(A) \cap FOLLOW(B) \neq NULL$, then reduce-reduce conflict happens

Shift-reduce conflicts in LR(1) items

CLR

LL1
LR(0) items : SLR(1)
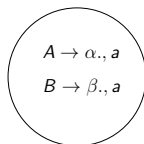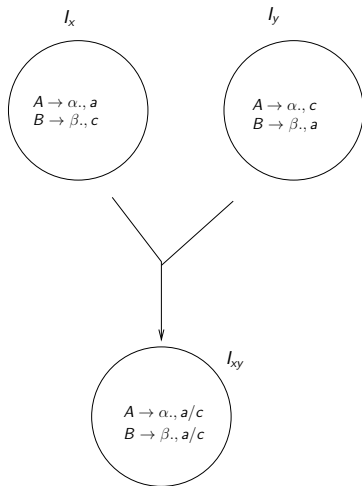LR(1) items : CLR(1)
LR(1) items : LALR(1)

Reduce-reduce conflicts in LR(1) items

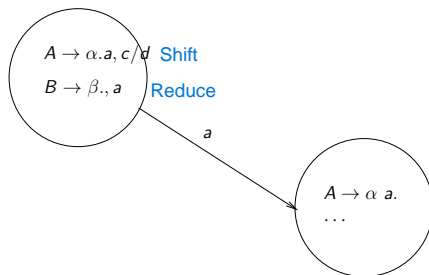
$A \to \alpha., a$
$B \to \beta., a$

Reduce-reduce conflicts in LALR Parsing technique
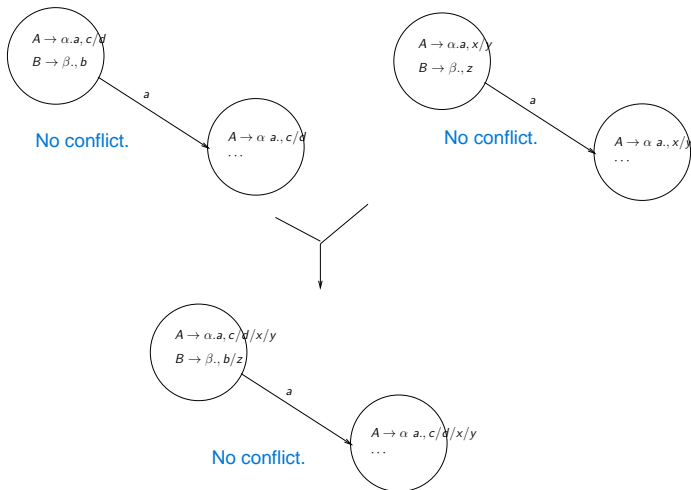

Reduce-reduce conflicts can arise if states are merged based on core.

Shift-reduce conflicts in LALR Parsing technique

If *CLR*(1) contains SR conflict, LALR also contains it

Shift-reduce conflicts in LALR Parsing technique

If $CLR(1)$ does not contain SR conflict, LALR also does not contain it

LALR parsing techniques

- The power of parsing is lesser than CLR method
- It can happen due to reduce-reduce conflicts