I → if S. and I → if S. else S

P. 2 5 (* Shift / Reduce conflict *)

== p. 3

S→ . S

S→ . id

S→ . V := E

V →. id

This state has a shift transition on id to the state

S → id.

V → id. (* Reduce / Reduce conflict *)

== P. 4

Definition of LR(1) transitions (part 1). Given an LR(1) item

[$A \to \alpha \bullet X\, \gamma,\ a$], where X is any symbol (terminal), there is a transition on X to the item

[$A \to \alpha\, X \bullet \gamma,\ a$].

Definition of LR(1) transitions (part 2). Given an LR(1) item

$[A \to \alpha \bullet B\, \gamma,\ a]$, where B is a nonterminal, there are

ε-transitions to items

$[B \to \bullet\beta,\ b]$ for every production $B \to \beta$ and

for every token b in <u>First (γa)</u>.

==

p. 5

$[A \to (\bullet A),\ \$]$

$[A \to \bullet (A),\ )]$

$[A \to \bullet a,\ )]$

== p.11

[S→ . S, $]

[S→ . id, $]

[S→ . V := E, $]

[V →. Id, :=]

This state has a shift transition on <u>id</u> to the state

[S → id., $]

[V → id., :=]

A grammar is an LR(1) grammar if it results in no ambiguity.

1. For any item [A → α . X β, a] in *s* with X a terminal, there is no item in *s* of the form [B → β . , X]; otherwise, there is a shift-reduce conflict.

2. There are no two items in *s* of the form [A → α . , a] and [B → β . , a]; otherwise, there is a reduce-reduce conflict.

== p. 13

SLR(1) (= LR(0) + Follow set)

If state *s* contains the complete item $A \rightarrow \gamma.$, and the next token in the input string is in Follow(A), then the action is to <u>reduce</u> by the rule $A \rightarrow \gamma$.

== p. 14

No ambiguity if

1. For any item $A \rightarrow \alpha \ . X \ \beta$ in *s* with X a terminal, there is no complete item $B \rightarrow \gamma\ .$ in *s* with X in Follow(B).

2. For any two complete items $A \rightarrow \alpha\ .$ and $B \rightarrow \beta\ .$ in *s*, Follow(A) $\cap$ Follow(B) is empty.

(resolve the shift-reduce conflict.)

== p. 30

LALR(1) (= LR(1)→merge states which have the same core.)