S14 $T \to (V).,\perp$ Reduce

S15 $T \to [u).,\perp$ Reduce

S16 $T \to [V].,+$ Reduce

NO conflicts so LALR(1)

(F) LALR(1)

State 6 + 12 Same bag configs

S6: $[u \to a.,\ ]\ ]$ $[V \to a.,\ )\ ]$

S12: $[u \to a.,\ )]$ $[V \to a.,\ ]]$

merged:

$[u \to a.,\ )\ ]\ ]$

$[V \to a.,\ )\ ]\ ]$

Follow sets both $\{),]\}$ - conflict so not LALR(1).

(G) free $u \to T$ $V \to T$

Right hand sides just unique so not precedence.

2: G2 generates 4 strings:

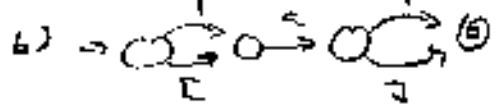
a) (a), $([a]]$, $[[a]]$, $[a)$

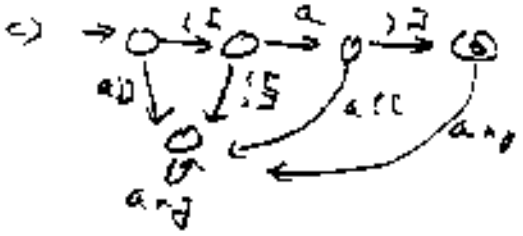
So grammar:

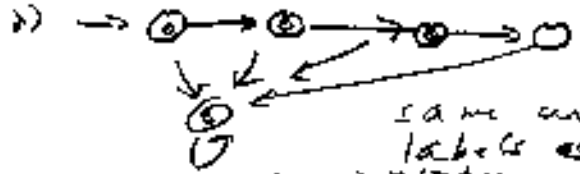
$S \to (X \mid [Y$

$X \to aY$

$Y \to]) \mid)$

b) 

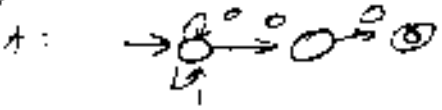
c) 

d) 

Reverse accept + reject states.

3. Divisible by 4 means ends in 00

Reg expr: $1 \mid 0 \mid (1 \mid 0)^* 00$

FSA: 

- Reg grammar: $S \to 0S \mid 1S$
  $S \to 0T$
  $T \to 0$

(A-E) $AB*CD*+EF*+*+$

$AB+CD-*$

(B) $++*AB*CD*E+FG$

$-+AB-CD$

(C)

If ambiguous then 2 distinct syntactical forms and 2 distinct trees for a given string.

If so, then consider 2 derivations. They must differ in at least 1 step.

$\ldots \Rightarrow q_1\ q_2\ q_3$ (I)

$\ldots \Rightarrow q_1\ q_2\ b_1\ b_2$ (II)

where $b_1 \overset{*}{\Rightarrow} q_3$

From (I) $q_2 \doteq q_3$

From (II) $q_2 < q_3$

Or else:

$\ldots \Rightarrow b_1\ b_2\ q_3 \ldots$

$\ldots \Rightarrow q_1\ q_1\ q_3$

where $b_2 \overset{*}{\Rightarrow} \ldots q_1$

So $q_2 \Rightarrow q_3$

$q_1 \doteq q_2 \doteq q_3$

Must have one of these conflicts