

1. Grammar symbols: Used cross reference.

Reference of each grammar's symbol used within each rule's productions. The index uses the tripple: rule name, its subrule no, and the symbol's position within the symbol string.

2. Rrule:.

Rrules 1.1 Rrules 2.2

3. Rrule_def:.

Rule 1.1

4. Rrules:.

Rules_use_cnt 1.1 Rrules 2.1

5. Rsubrule:.

Rsubrules 1.1 Rsubrules 2.2

6. Rsubrule_def:.

Rsubrule 1.1

7. Rsubrule_s_used_rules:.

Rsubrule_s_used_rules_epi 2.1 Rsubrule_s_used_rules 2.1

8. Rsubrule_s_used_rules_epi:.

Rsubrules 1.2 Rsubrules 2.3

9. Rsubrules:.

Rule 1.2 Rsubrules 2.1

10. ϵ :.

Rsubrule_s_used_rules_epi 1.1

11. eog:.

Rrules_use_cnt 1.2

12. refered-rule:.

Rsubrule_s_used_rules 1.1 Rsubrule_s_used_rules 2.2

13. rule-def:.

Rule_def 1.1

14. subrule-def:.

Rsubrule_def 1.1

15. Grammar Rules's First Sets.

16. *Rrules_use_cnt* # in set: 1.
rule-def

17. *Rrules* # in set: 1.
rule-def

18. *Rrule* # in set: 1.
rule-def

19. *Rrule_def* # in set: 1.
rule-def

20. *Rsubrules* # in set: 1.
subrule-def

21. *Rsubrule* # in set: 1.
subrule-def

22. *Rsubrule_def* # in set: 1.
subrule-def

23. *Rsubrule_s_used_rules_epi^ε* # in set: 1.
referred-rule

24. *Rsubrule_s_used_rules* # in set: 1.
referred-rule

25. LR State Network.

List of productions with their derived LR state lists. Their subrule number and symbol string indicates the specific production being derived. The “▷” symbol indicates the production's list of derived states from its closed state. Multiple lists within a production indicate 1 of 2 things:

- 1) derived string that could not be merged due to a lr(1) conflict
- 2) partially derived string merged into another derived lr states

A partially derived string is indicated by the “merged into” symbol \nearrow used as a superscript along with the merged into state number.

26. Rrules_use_cnt.

1 Rrules eog
▷ 1 3 4

27. Rrules.

1 Rule
▷ 1 17
2 Rrules Rule
▷ 1 3 5

28. Rrule.

```
1 Rrule_def Rsubrules
  ▷ 1 6 8
  ▷ 3↗6
```

29. Rrule_def.

```
1 rule-def
  ▷ 1 2
  ▷ 3↗2
```

30. Rsubrules.

```
1 Rsubrule Rsubrule_s_used_rules_epi
  ▷ 6 15 16
2 Rsubrules Rsubrule Rsubrule_s_used_rules_epi
  ▷ 6 8 9 11
```

31. Rsubrule.

```
1 Rsubrule_def
  ▷ 6 14
  ▷ 8↗14
```

32. Rsubrule_def.

```
1 subrule-def
  ▷ 6 7
  ▷ 8↗7
```

33. Rsubrule_s_used_rules_epi.

```
1 ε
  ▷ 9
  ▷ 15
2 Rsubrule_s_used_rules
  ▷ 9 12
  ▷ 15↗12
```

34. Rsubrule_s_used_rules.

```
1 refered-rule
  ▷ 9 10
  ▷ 15↗10
2 Rsubrule_s_used_rules refered-rule
  ▷ 9 12 13
  ▷ 15↗12
```

35. List of reducing states.

The following legend indicates the type of reducing state.

Points 2–4 are states that must meet the lr(1) condition:

- 1) r — only 1 production reducing
- 2) r^2 — 2 or more reducing productions
- 3) s/r — shift and 1 reducing production
- 4) s/r^2 — shift and multiple reducing productions

$\subset 2^r \ 4^r \ 5^r \ 7^r \ 8^{s/r} \ 9^{s/r} \ 10^r \ 11^r \ 12^{s/r} \ 13^r \ 14^r \ 15^{s/r} \ 16^r \ 17^r$

36. Lr1 State's Follow sets and reducing lookahead sets.

Notes on Follow set expressions:

1) The “follow set” for rule uses its literal name and tags its grammar rule rank number as a superscript. Due to space limitations, part of the follow set information uses the rule's literal name while the follow set expressions refers to the rule's rank number. This \langle rule name, rule rank number \rangle tuple allows you the reader to decipher the expressions. Transitions are represented by S_xR_z whereby S is the LR1 state identified by its “x” subscript where other transient calculations occur within the LR1 state network. R indicates the follow set rule with the subscript “z” as its grammar rank number that contributes to the follow set.

The \nearrow^x symbol indicates that a merge into state “x” has taken place. That is, the reduced subrule that depends on this follow set finds its follow set in 2 places: its birthing state that generated the sequence up to the merged into state, and the birthing state that generated the “merged into” state. So the rule's “follow set” calculation must also continue its calculation within the birth state generating the “x merged into” state.

```

State: 1      Follow Set contributors, merges, and transitions
← Follow set Rule → ←          follow set symbols contributors          →
Rules_use_cnt1
Local follow set yield:
  eolr.
← Follow set Rule → ←          follow set symbols contributors          →
Rules2          R1.1.1 R2.2.1
Local follow set yield:
  eog, rule-def.
← Follow set Rule → ←          follow set symbols contributors          →
Rule3          R2.1.1 S1R2
Local follow set yield:

← Follow set Rule → ←          follow set symbols contributors          →
Rule_def4      R3.1.1  $\nearrow^3$ 
Local follow set yield:
  subrule-def.

State: 3      Follow Set contributors, merges, and transitions
← Follow set Rule → ←          follow set symbols contributors          →
Rule3          R2.2.2  $\nearrow^1$  S1R2
Local follow set yield:

← Follow set Rule → ←          follow set symbols contributors          →
Rule_def4      R3.1.1
Local follow set yield:
  subrule-def.

State: 6      Follow Set contributors, merges, and transitions
← Follow set Rule → ←          follow set symbols contributors          →
Rsubrules5     R3.1.2 R5.2.1 S3R3
Local follow set yield:
  subrule-def.
← Follow set Rule → ←          follow set symbols contributors          →
Rsubrule6     R5.1.1 R5.1.2 S6R5
Local follow set yield:

```

referred-rule.
 \leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_def⁷ $R_{6.1.1} \nearrow^8 S_6 R_6$
 Local follow set yield:

State: 8 Follow Set contributors, merges, and transitions
 \leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule⁶ $R_{5.2.2} R_{5.2.3} \nearrow^6 S_6 R_5$
 Local follow set yield:
 referred-rule.

\leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_def⁷ $R_{6.1.1} S_8 R_6$
 Local follow set yield:

State: 9 Follow Set contributors, merges, and transitions
 \leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_s_used_rules_epi⁸ $R_{5.2.3} \nearrow^{15} S_6 R_5$
 Local follow set yield:

\leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_s_used_rules⁹ $R_{8.2.1} R_{9.2.1} \nearrow^{15} S_9 R_8$
 Local follow set yield:
 referred-rule.

State: 15 Follow Set contributors, merges, and transitions
 \leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_s_used_rules_epi⁸ $R_{5.1.2} S_6 R_5$
 Local follow set yield:

\leftarrow Follow set Rule $\rightarrow \leftarrow$ follow set symbols contributors \rightarrow
 Rsubrule_s_used_rules⁹ $R_{8.2.1} R_{9.2.1} S_{15} R_8$
 Local follow set yield:
 referred-rule.

37. Common Follow sets.

38. LA set: 1.

subrule-def.

39. LA set: 2.

eolr.

40. LA set: 3.

eog, rule-def.

41. LA set: 4.

eog, rule-def, subrule-def, refered-rule.

42. LA set: 5.

eog, rule-def, subrule-def.

43. Index.

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rules_use_cnt_idx.w

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