

Example

LR(1) Parse

| | | | | | |
|---|---|--|----|---|---|
| 0 | [G → •E, ⊥] [E → •E+T, ⊥+] [E → •T, ⊥+] [T → •T*F, ⊥+*] [T → •F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | E → 1 T → 2 F → 3 a → 4 (→ 5 | 7 | [T → T*•F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | F → 14 a → 4 (→ 5 |
| 1 | [G → E•, ⊥] [E → E•+T, ⊥+] | ⊥ → R1 + → 6 | 8 | [F → (E•), ⊥+*] [E → E•+T, ⊥+] |) → 15 + → 16 |
| 2 | [E → T•, ⊥+] [T → T•*F, ⊥+*] | ⊥+ → R3 * → 7 | 9 | [E → T••, ⊥+] [T → T•*F, ⊥+*] |)• → R3 * → 17 |
| 3 | [T → F•, ⊥+*] | R5 | 10 | [T → F•, ⊥+*] |)• → R5 |
| 4 | [F → a•, ⊥+*] | R6 | 11 | [F → a•, ⊥+*] |)• → R6 |
| 5 | [F → (•E), ⊥+*] [E → •E+T, ⊥+] [E → •T, ⊥+] [T → •T*F, ⊥+*] [T → •F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | E → 8 T → 9 F → 10 a → 11 (→ 12 | 12 | [F → (•E), ⊥+*] [E → •E+T, ⊥+] [E → •T, ⊥+] [T → •T*F, ⊥+*] [T → •F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | E → 20 T → 9 F → 10 a → 11 (→ 12 |
| 6 | [E → E+•T, ⊥+] [T → •T*F, ⊥+*] [T → •F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | T → 13 F → 3 a → 4 (→ 5 | 13 | [E → E+T•, ⊥+] [T → T•*F, ⊥+*] | ⊥+ → R2 * → 7 |
| | | | 14 | [T → T*F•, ⊥+*] | ⊥+* → R4 |
| | | | 15 | [F → (E)•, ⊥+*] | ⊥+* → R7 |
| | | | 16 | [E → E+•T, ⊥+] [T → •T*F, ⊥+*] [T → •F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | T → 18 F → 10 a → 11 (→ 12 |

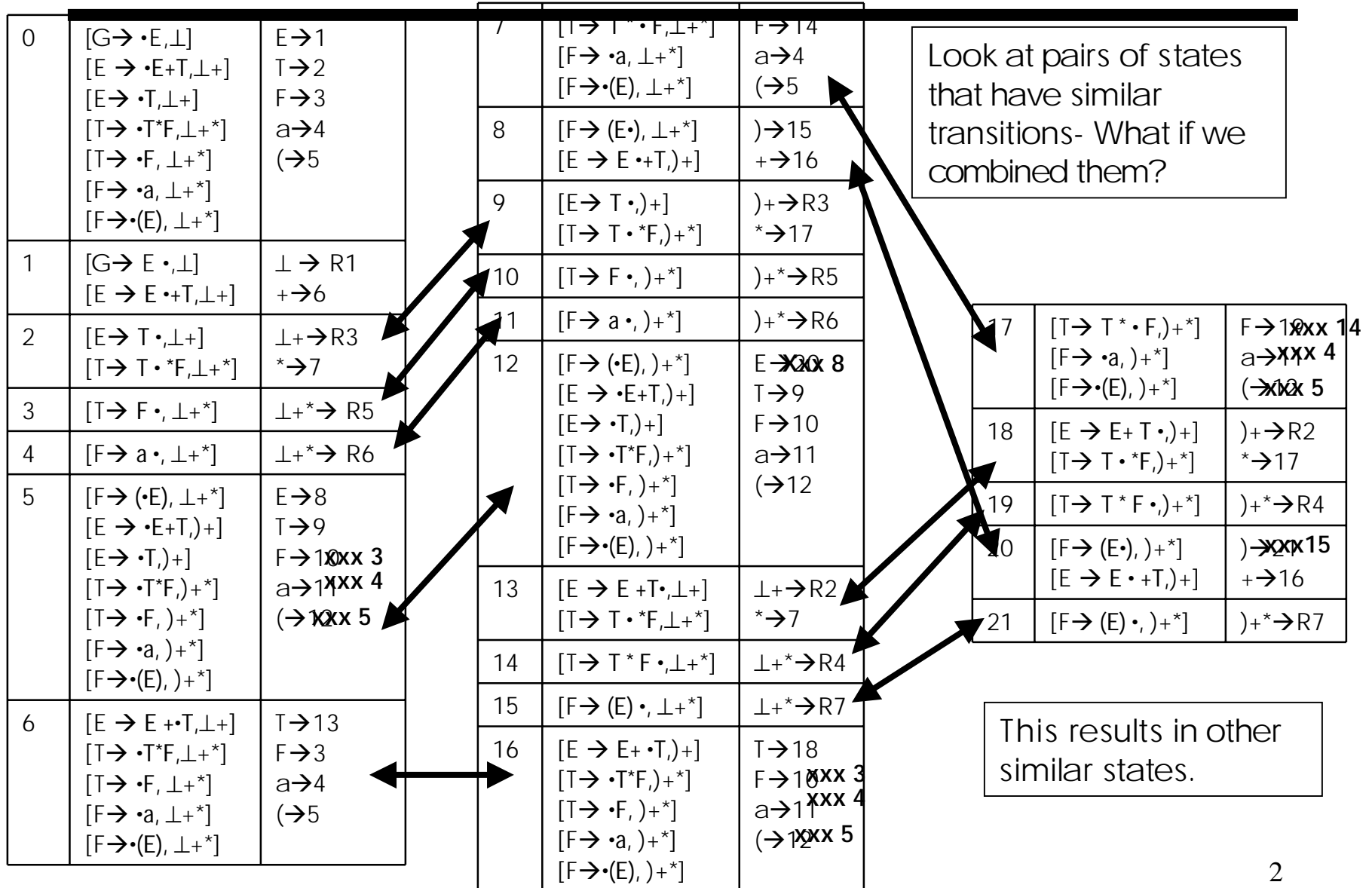
| Rules | Production |
|-------|---------------|
| 1 | G → E ⊥ |
| 2-3 | E → E + T T |
| 4-5 | T → T * F F |
| 6-7 | F → a (E) |

| | | |
|----|---|----------------------------|
| 17 | [T → T*•F, ⊥+*] [F → •a, ⊥+*] [F → •(E), ⊥+*] | F → 19 a → 11 (→ 12 |
| 18 | [E → E+T•, ⊥+] [T → T•*F, ⊥+*] |)• → R2 * → 17 |
| 19 | [T → T*F•, ⊥+*] |)• → R4 |
| 20 | [F → (E•), ⊥+*] [E → E•+T, ⊥+] |) → 21 + → 16 |
| 21 | [F → (E)•, ⊥+*] |)• → R7 |

No conflicts so LR(1)

Example

LALR(1) Parse



LALR(1) Grammars

- Combine 2 states if they have the same core items and compatible goto functions
- Repeat process as long as they have the same core items
- If cannot combine 2 states, then grammar is not LALR(1) but still LR(1).
- Any states that can be combined can remain combined.