

• [HOME](#) • [UP](#) •[Top/Bottom-up parsing/LR parsers](#)

## 9.2. LR parsing and augmented grammars (Dragon Book page 241...)

### LR parsing

---

Now we turn to a class of parsers known collectively as LR parsers. The L indicates that the parser reads the input from left to right, and the R indicates that it produces a rightmost derivation (and so is a bottom-up style of parsing).

### Augmented grammars

---

For technical reasons, we do not want the start symbol to appear on the right-hand side of any production. That is easy to arrange.

If  $G$  is a grammar with start nonterminal  $S$ , form the *augmented grammar*  $G'$  by adding a new nonterminal  $S'$  to  $G$  and adding one production,  $S' \rightarrow S$ . The start nonterminal of  $G'$  is  $S'$ .

I will describe the simplest of the LR parsers, LR(0), using an augmented version of our unambiguous expression grammar as a running example. The start nonterminal is  $E'$ .

1.  $E' \rightarrow E$
2.  $E \rightarrow T$
3.  $E \rightarrow E + T$
4.  $T \rightarrow F$
5.  $T \rightarrow T * F$
6.  $F \rightarrow \mathbf{n}$
7.  $F \rightarrow ( E )$

• [HOME](#) • [UP](#) •[Top/Bottom-up parsing/LR parsers](#)