

Software Specifications Recursive Descent Parsing

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Parsing

Parsing is the process of determining whether a string of tokens can be generated by a grammar. There are many types of parsing:

- Brute Force Parsing—systematically tries all possible derivations. $O(2^n)$
- dynamic programming algorithm—General CF Grammars can be parsed in $O(n^3)$
- sophisticated Parsing Table—can parse a Deterministic CF Grammar in $O(n)$

Recursive Paring we shall now consider a Deterministic CF Grammar using Predictive Recursive Descent parsing. to do this we must:

- associate a procedure to each non-terminal of the grammar
- the parser then decides which production to use for a given non-terminal based only on the current input token

Example

Given the set of balanced strings: $\{0^i 1^i \mid i \geq 0\}$ it would have the followiung grammar:

$$\langle balanced \rangle \rightarrow 0 \langle balanced \rangle 1 \mid \epsilon$$

and thus, a possible predictive parser for this grammar is:

- if next token is 0, use $\langle balanced \rangle \rightarrow 0 \langle balanced \rangle 1$
- if next token is 1, use $\langle balanced \rangle \rightarrow \epsilon$