

Grammars in Action

Example: A simple programming language grammar.

```
G: <Exp>* ::= <Exp> + <Exp>
      | <Exp> * <Exp>
      | ( <Exp> )
      | a
      | b
      | c
```

Terminal symbols!!!

```
S = a
S = a + b
S = a + b * c
S = (a + b) * c
S = ((a + b))
S = c(a + b)
S = (c)(b)
S = b++
```

} $S \in L(G)?$

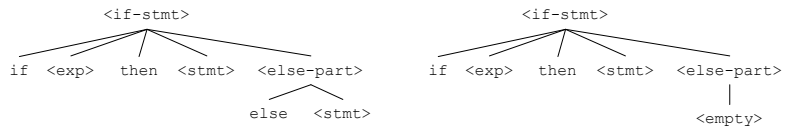
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- The empty symbol: $\langle \text{empty} \rangle$
- The only non-terminal that does not have a rule defining it.
- That is the $\langle \text{empty} \rangle$ symbol derives nothing.

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Consider the following grammar fragment:

```
<if-stmt> ::= if <exp> then <stmt> <else-part>  
<else-part> ::= else <stmt> | <empty>  
<exp> ::= ...  
<stmt> ::= ...
```



Grammars in Action

- 2.1 a) Let $L(G)$ be the language of all string consisting of zero or more a's.
- 2.1 i) Let $L(G)$ be the set of strings consisting of one or more a's with a comma between each a and the next.
- 2.1 d) Let $L(G)$ be the set of all strings consisting of one or more digits 0 – 9.

HW#1 Chap 2
Exercises 1 b,c,g,j