

## Syntax

= is the way in which words (tokens) are put together to form phrases or sentences

examples: arithmetic expressions.

$$1+2*3-4 \oplus$$

$$1+2*3 \oplus$$

$$1+*3 \ominus$$

$$1+(*3) \ominus$$

$$1+3*(2+7) \oplus$$

$\oplus$  correct.

$\ominus$  error.

A Context free grammar describes a language.

(here the language of arithmetic expression). what is needed.

1) Start symbol  $S$

2) Terminal symbol, such as digits 0, 1, ..., 9, a, b, C, +, -, \*, /, (, )

3) Nonterminal symbol, e.g.

expr (1+5)

id (identifier)

digit

factor

term

~~term~~

(5\*6)

4) productions.

$$S \rightarrow \text{expr} + \text{expr}$$

$$\text{expr} \rightarrow \text{expr} - \text{expr}$$

$$\text{expr} \rightarrow \text{digit}$$

$$\text{digit} \rightarrow 0$$

$$\text{digit} \rightarrow 1$$

$$\vdots$$

$$\text{digit} \rightarrow 9$$

$$\text{digit} \rightarrow 0|1|2|\dots|9$$