

# Grammar notation quick reference sheet

A context-free grammar consists of

- some terminal symbols  $a, b, \dots, +, \rangle, \dots$
- some non-terminal symbols  $A, B, S, \dots$
- a distinguished non-terminal start symbol  $S$
- some rules of the form

$$A \rightarrow X_1 \dots X_n$$

where  $n \geq 0$ ,  $A$  is a non-terminal, and the  $X_i$  are symbols.

## Notational conventions for grammars

- We use Greek letters  $\alpha, \beta, \gamma, \sigma, \pi, \rho$ , to stand for strings of symbols that may contain both terminals and non-terminals.
- In particular,  $\varepsilon$  is used for the empty string (of length 0).
- $v, w, x, y, z$  are used for strings containing only *terminal* symbols
- We write  $A, B, \dots$  for non-terminals.
- We usually write  $S$  for the start symbol.
- Terminal symbols are usually written as lower case letters  $a, b, c, \dots$
- $X, Y, Z$  are used for grammar symbols that may be terminal or non-terminal
- These conventions are handy once you get used to them and are found in most books, e.g. the “Dragon Book” and Knuth’s classic paper on LR(k)