

Class 5

What is a Context-Free Grammar?

Terminals - tokens

Nonterminals - categories

Set of Productions - rewriting rules

Start symbol - special nonterminal

Understanding Context Free Grammars

Give some legal strings accepted by this grammar? (illegal but close)

$$\begin{aligned} E &\rightarrow E + T \mid E - T \mid T \\ T &\rightarrow T * F \mid T / F \mid F \\ F &\rightarrow i \end{aligned}$$

Give some legal strings accepted by this grammar? (illegal but close)

$$\begin{aligned} S &\rightarrow \text{procedure id } P ; \mid \varepsilon \\ P &\rightarrow (L) \mid \varepsilon \\ L &\rightarrow R : T \mid R : T ; L \\ R &\rightarrow V D \\ V &\rightarrow \text{var } \mid \varepsilon \\ D &\rightarrow D , \text{id} \mid \text{id} \\ T &\rightarrow \text{int} \mid \text{real} \end{aligned}$$

Writing Context Free Grammars

Write a grammar for predicates within if conditions,
Where the condition is a predicate or logical expression

Example legal conditions:

$x < y$

$(w == 8) \text{ and } (j < 10)$

not w

not $(w < y)$