Syntax Analysis for Natural language.

5-10-2021

(structure)

↳ principles and processes by which sentences are constructed in a language.

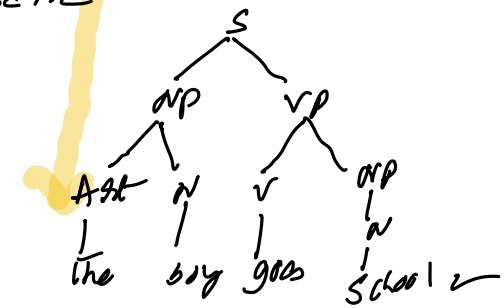
↳ Syntactic investigation's goal is to construct the grammar of the language.

Linguistic levels: phonemics, morphology, phrase structure

NP, VP, N, PP ...

S

Parsing - It is incremental production of syntactic description of input



Here, we have generated a parse-tree, ∴ this is called Generative Methodology & Grammar is generative Grammar.

original form of Grammar is BNF (Backus-Naur Form), and all others are variants.

parsing has two objective - 1) to generate the sentence
2) to find out relations between various units (phrases) of the sentence for obtaining meaning.

Grammar $G = (NT, \Sigma, S, P)$

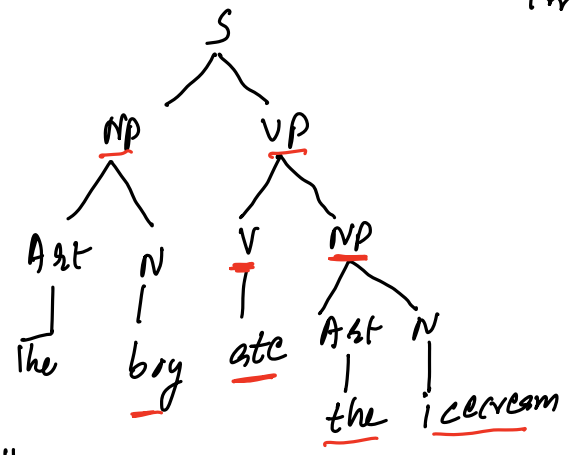
NT (Non-terminals)

$= \{S, NP, N, VP, V, Art\}$

Σ = terminals = {boy, icecream, dog, like, ate, the, a, bite,}

set of production rules:

$$
\begin{aligned}
P = \{ \; & S \rightarrow NP \; VP, \\
& NP \rightarrow Art \; N \mid N, \\
& VP \rightarrow V \mid V \; NP, \\
& Art \rightarrow a \mid the, \\
& N \rightarrow boy \mid icecream \mid dog \\
& V \rightarrow like \mid ate \mid bite. \}
\end{aligned}
$$



= "The boy ate the icecream"

∴ we have generated the sentence & grammar gives a structure to the sentence also.

Inside a computer, the structure is in the form of a tuple or list or some other data structure.

(S (NP (Art the)(N boy))
(VP (V ate) (NP (Art the)
(N icecream)))))

there is association clearly visible, i.e. "NP VP" are together, ...

Preposition phrase { PP → Prep NP
(on the table)

VP → V ADV | V PP | V NP PP | Aux V NP

goes school on bike → ....was doing work
....is

Det → Art Adj | Art
Art → an | an | the

using these we can construct the sentences: e.g.

PP → Prep NP
in

- The crual man licked the dog in the house.
- The laborious person worked to make some extra money.

NP V prep

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