

ASSIGNMENT

Activity Guidance

Create a constituency-based parse tree for the following phrases:

- The government raised interest rates.
- The internet gives everyone a voice.
- The man saw the dog with the telescope.

Add your completed tree to your e-Portfolio.

Learning Outcomes

- The knowledge and skills required to develop, deploy and evaluate the tools and techniques of intelligent systems to solve real-world problems.
- An understanding of contemporary research issues in the area of intelligent agent systems.

PARSE TREE

by Maria Ingold

Constituents are larger units in a sentence that operate as a unit (Carnie, 2012). For instance, in “The student studied AI.”, *the* and *student* are part of a unit that can be represented as [the student]. This bigger unit is a constituent. Constituents are part of a hierarchical structure that forms a parse tree (Table 1).

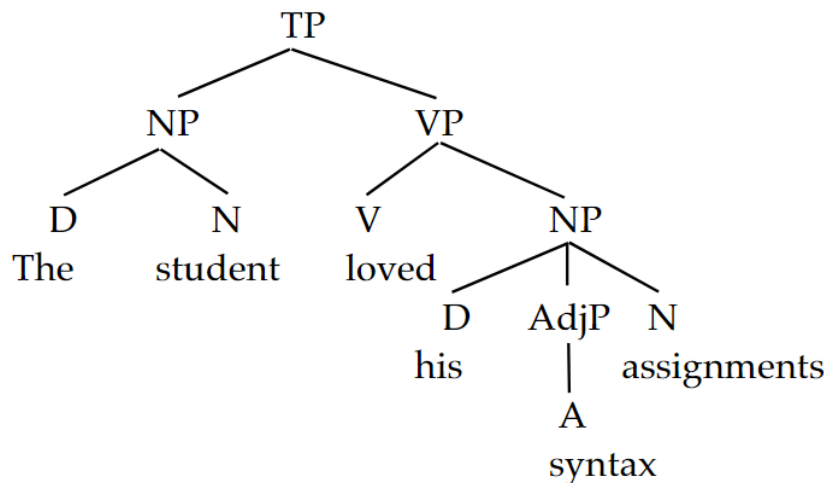


FIGURE 1 | Carnie (2012) constituent parse tree example

The nodes of the tree are parts of speech (POS) and the leaves have the words. For the sentence, “The student loved his syntax assignments.”, the parse tree is in Figure 1 and the bracketed diagram is in Figure 2.

[_{TP}[_{NP}[_DThe][_Nstudent]] [_{VP}[_Vloved]] [_{NP}[_Dhis][_{AdjP}[_{Adj}syntax]] [_Nassignments]]].

FIGURE 2 | Carnie (2012) bracketed diagram

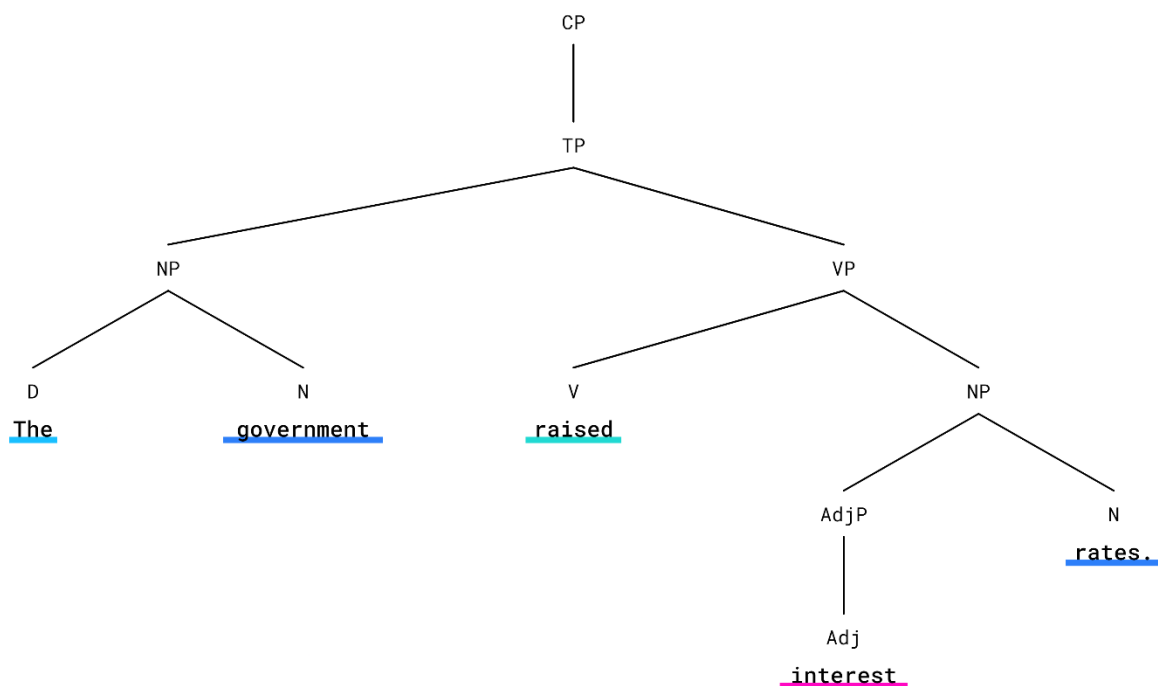
TABLE 1 | Carnie (2012) Parts of Speech (POS)

POS	Description	Examples	Other usage
TP	Tree Structure		S
NP	Noun phrase	The student	
VP	Verb phrase	loved cats	
AdjP	Adjective phrase	syntax assignments	
PP	Preposition phrase	with the cat	
D	Determiner (article)	the, a, this, most, six, my, which	
N	Noun	student, cats, AI	
V	Verb	loved	
A	Adjective	syntax	
P	Preposition	with, above, to, by	
Conj	Conjunctions	and, or, nor	
C	Complementizers	that, for, if	
T	Tense	have, am, was, shall, must, to	

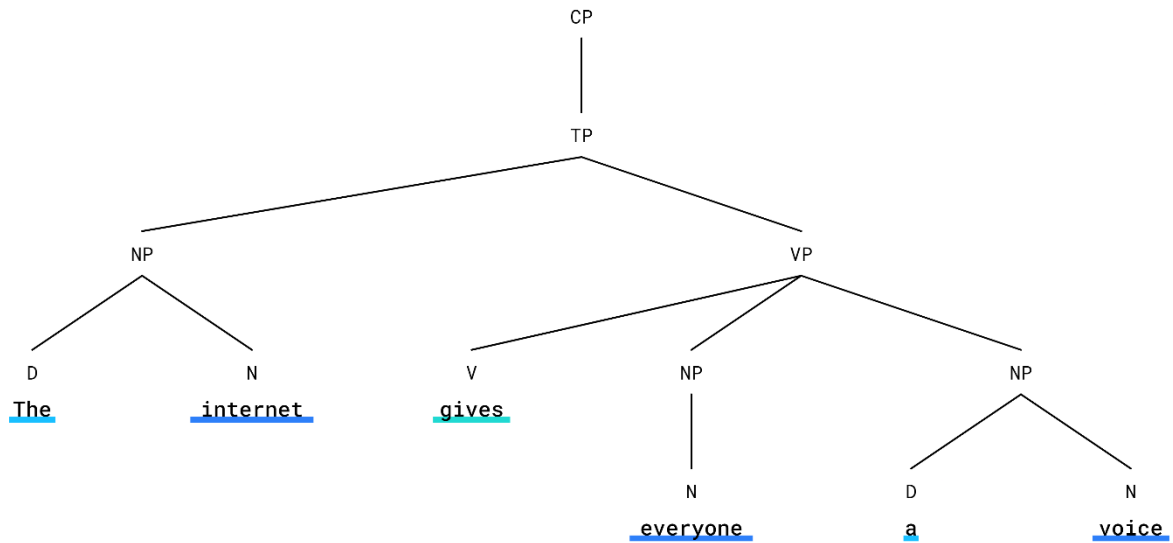
Parts of speech are from Carnie (2012), and other usage comes from Zimmerman (2019). Phrases are the representation of constituents.

The POS tagging of individual words is done manually with the expected logic as per Carnie above. As bracketed diagram is not considered particularly readable, they are then manually tagged and drawn as constituency-based parse tree diagrams using Linguistic Tree Solver with rules also based on Carnie as described above (Comer, N.D.).

The government raised interest rates.



The internet gives everyone a voice.

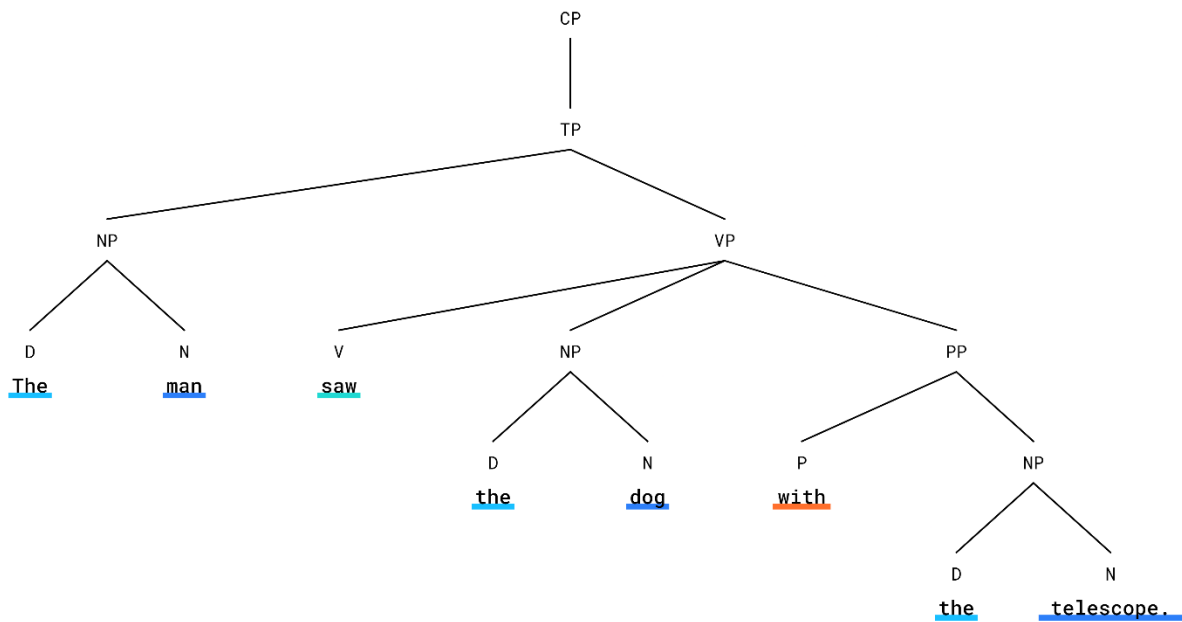


The man saw the dog with the telescope.

While this could be interpreted as either:

- The man, looking through a telescope, saw the dog.
- The man saw a dog, and the dog had a telescope.

Rationally, the first is correct usage, but they are the same structure.



References:

Carnie, A. (2012) *Syntax : A Generative Introduction*. 3rd ed, 2012. Chichester: Wiley-Blackwell.

Comer, A.B. (N.D.) *Linguistics Tree Solver*. Available from: <https://lin-tree-solver.adambcomer.com> [Accessed 18 January 2024].

Zimmerman, V. (2019) *Getting to grips with parse trees, Towards Data Science*. Available from: <https://towardsdatascience.com/getting-to-grips-with-parse-trees-6e19e7cd3c3c> [Accessed 18 January 2024].