Unit 8
Creating Parsing Tree
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Although we speak in linear sequences of words, linguistic understanding is inherently hierarchical; sentences possess an internal structure that defines their meaning. A constituency-based parse tree makes that hierarchical structure explicit by organizing words into nested subphrases (Zimmerman, 2019).

Why Parse Trees Matter

- They reveal the **syntactic roles** (subject, verb, object) in a sentence
- They make clear **nested structure**, helping agents interpret modifiers, clauses, and scope
- They expose **ambiguities**, such as prepositional phrase attachments
- They serve as a bridge from raw text to semantic understanding — essential for dialogue systems, extraction, and translation
- In the context of intelligent agents, parsing enables machines to interpret natural language inputs with syntactic awareness. By mapping sentence structure, agents can perform more accurate semantic role labelling and dialogue interpretation, forming a foundation for applications such as chatbots, translation systems, and question–answering models (Zimmerman, 2019).

Following the syntactic principles outlined by Carnie (2012), the constituent parse tree examples below illustrate how phrases are hierarchically structured.
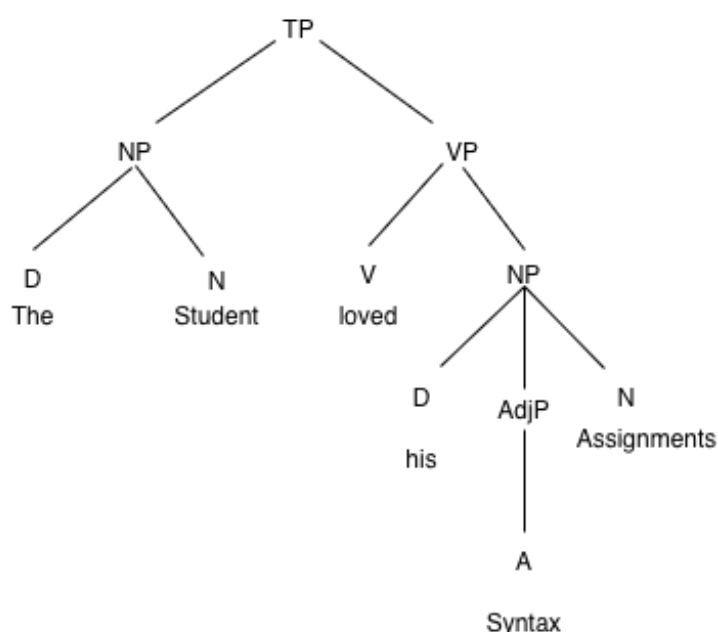
Below table adapted from Parts of speech are from Carnie (2012) and Zimmerman (2019).

| Abbreviation	Category	Description / Function	Example
S / TP	Sentence / Tense Phrase	Represents the overall sentence or clause; includes subject and predicate, headed by Tense.	The student read the book.
NP	Noun Phrase	Contains a noun as its head, may include determiners or modifiers.	A clever student
VP	Verb Phrase	Centred around a verb; may include objects or complements.	read the book
AdjP	Adjective Phrase	Built around an adjective; can be modified by adverbs or complements.	very interesting
PP	Prepositional Phrase	Begins with a preposition and takes a noun phrase complement.	in the classroom
Det (D)	Determiner	Specifies or quantifies the noun.	the, some, this, my
N	Noun	Refers to people, objects, concepts, or places.	book, student, AI
V	Verb	Denotes action, occurrence, or state.	run, analyse, was
Adj (A)	Adjective	Describes or qualifies a noun.	smart, large, complex
P	Preposition	Links nouns or pronouns to other sentence elements.	on, under, near
Conj	Conjunction	Connects words, phrases, or clauses.	and, but, or
C	Complementizer	Introduces subordinate clauses or complements.	that, if, whether
T	Tense / Auxiliary	Marks tense or modality in a clause.	is, was, will, must

1) The government raised interest rates.
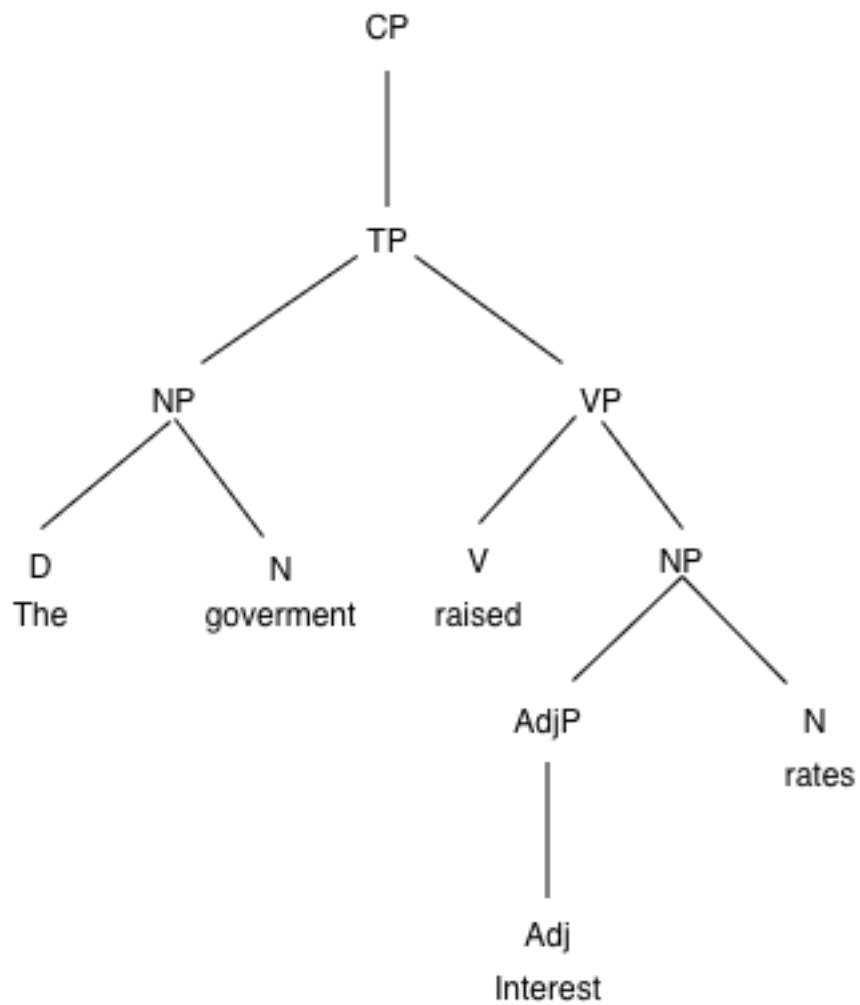
Figure 1. Constituency parse tree for "The government raised interest rates." (Created using draw.io.)
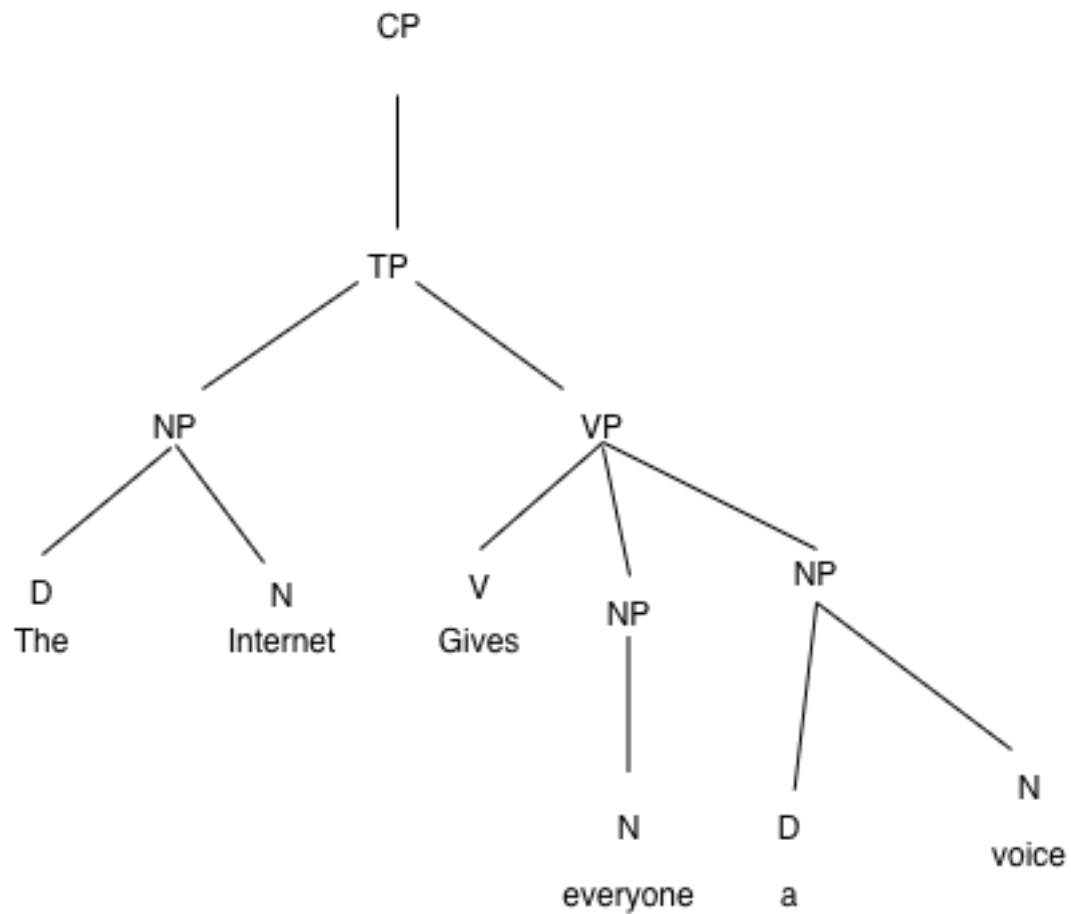
2) The internet gives everyone a voice.

Figure 2. Constituency parse tree for "The internet gives everyone a voice." (Created using draw.io.)
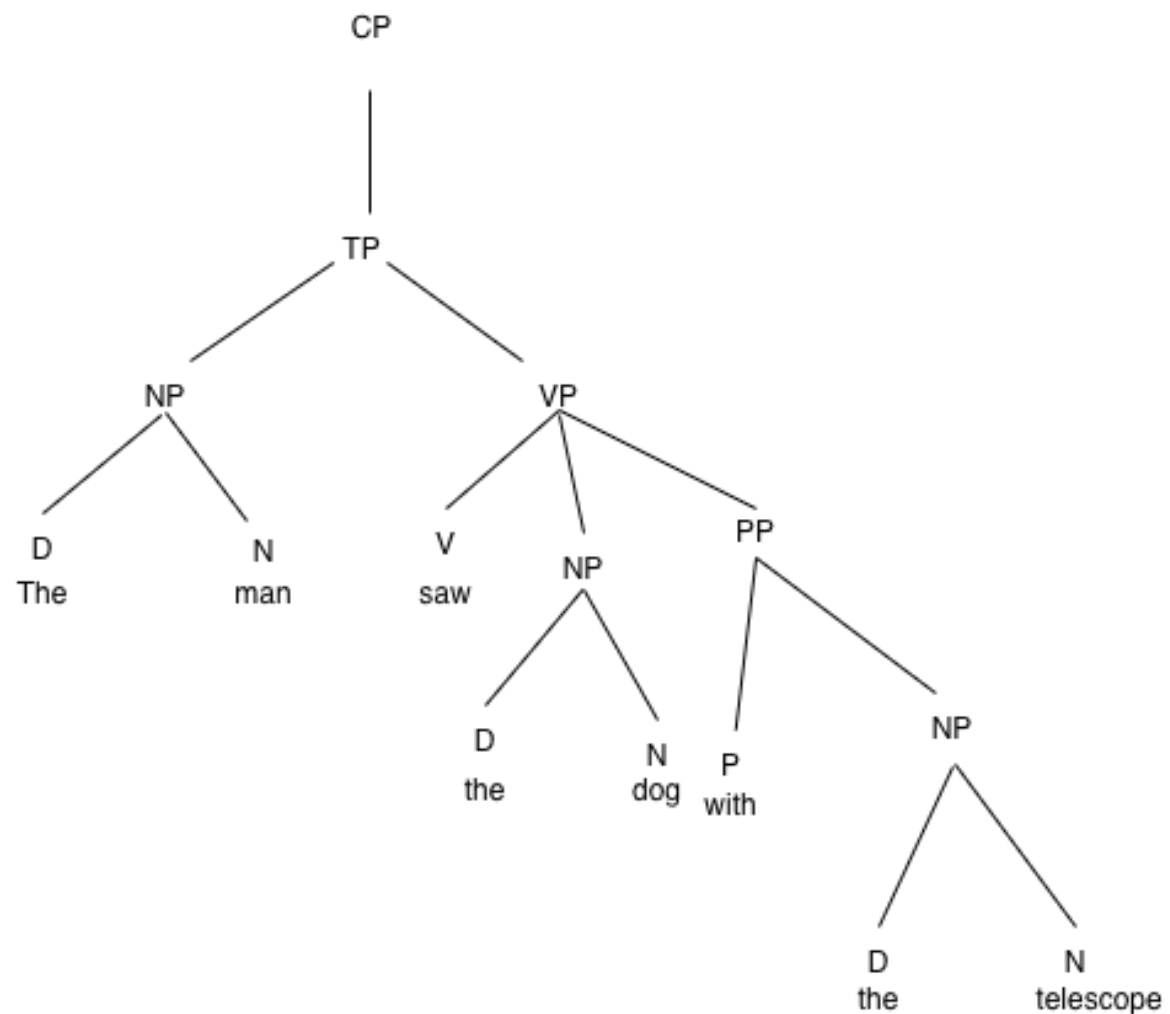
3) The man saw the dog with the telescope.

Figure 3. Constituency parse tree for "The man saw the dog with the telescope." (Created using draw.io.)

References

- Zimmerman, A. (2019) *Getting to Grips with Parse Trees*. Available at: https://towardsdatascience.com/getting-to-grips-with-parse-trees-6e19e7cd3c3c/ (Accessed: 01 October 2025).
- Carnie, A. (2012) Syntax: A Generative Introduction. 3rd ed, 2012. Chichester: Wiley-Blackwell