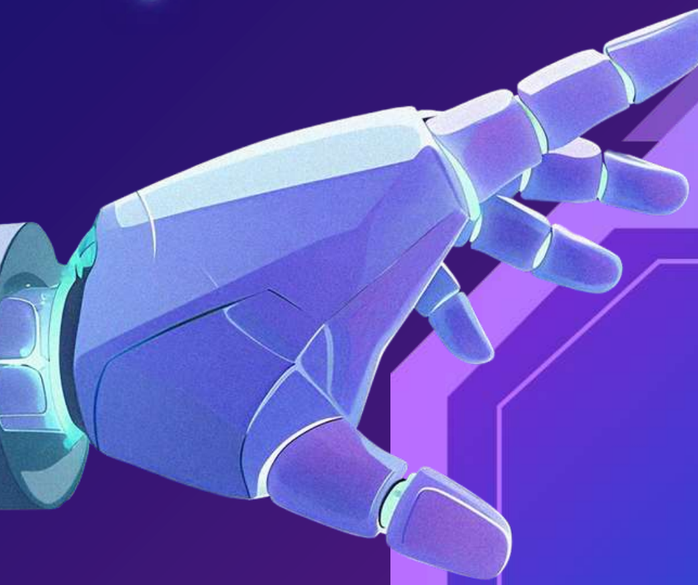
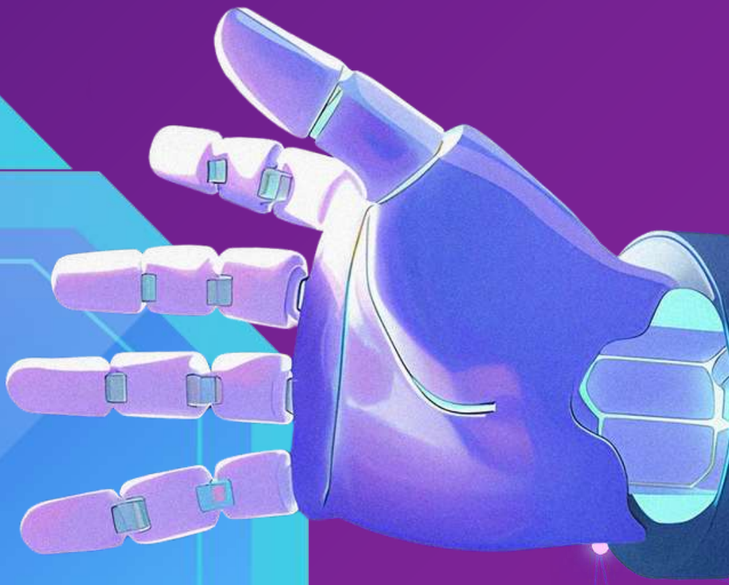
NLP

Natural Language Processing





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What is NLP?

NLP (Natural Language Processing) = a part of AI that helps machines understand human language.

Goal: make machines understand text and do tasks like:

Spell check

Translation

Topic classification

Companies use NLP to get insights from data and automate work

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Main Components of NLP

NLG (Natural Language Generation)

Turns data into human-like sentences.

Steps:

1. Text planning → choose content

2. Sentence planning → build phrases, set tone

3. Text realization → create real sentences

Examples: chatbots, translation, voice assistants.

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Main Components of NLP

NLU (Natural Language Understanding)

Makes machines understand and interpret language.

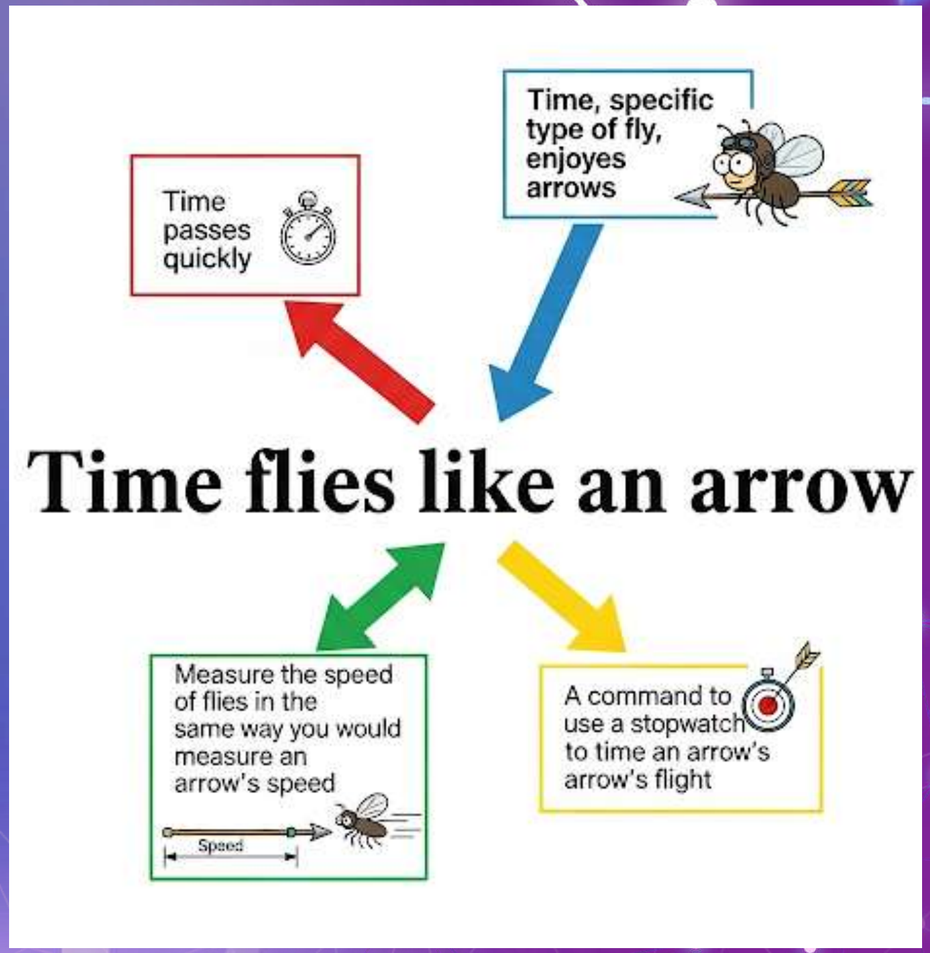
Tasks: analyze language, map text into meaning.

Challenge: ambiguity (different meanings).

Lexical: one word, many meanings (e.g., “match”).

Syntactic: sentence with more than one meaning (e.g., “The fish is ready to eat”).

Referential: unclear pronouns (e.g., “Tom met Jerry and John. They went to the movies”



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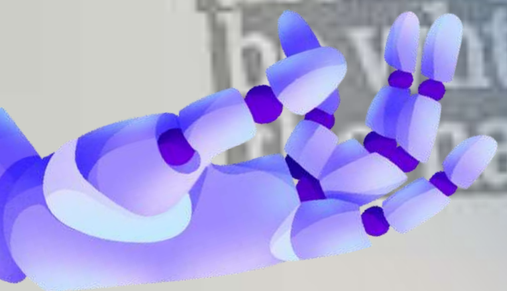
NLP Pipeline (Part 1)

Steps to process language:

Sentence Segmentation → split text into sentences.

Word Tokenization → split sentences into words.

Stemming → reduce words to their base (intelligent → intellig).



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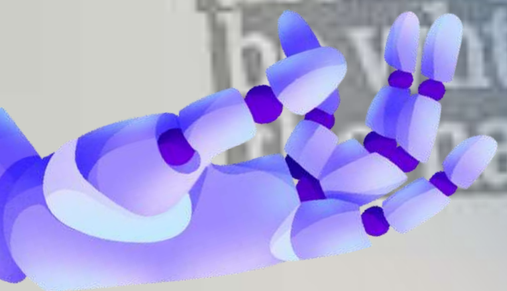
NLP Pipeline (Part 2)

Steps to process language:

- Lemmatization → bring word to correct root (playing → play).
- Stop Word Removal → remove common words (is, the, a).
- Dependency Parsing → find relations between words.
- POS Tagging → label words as noun, verb, adjective, etc.



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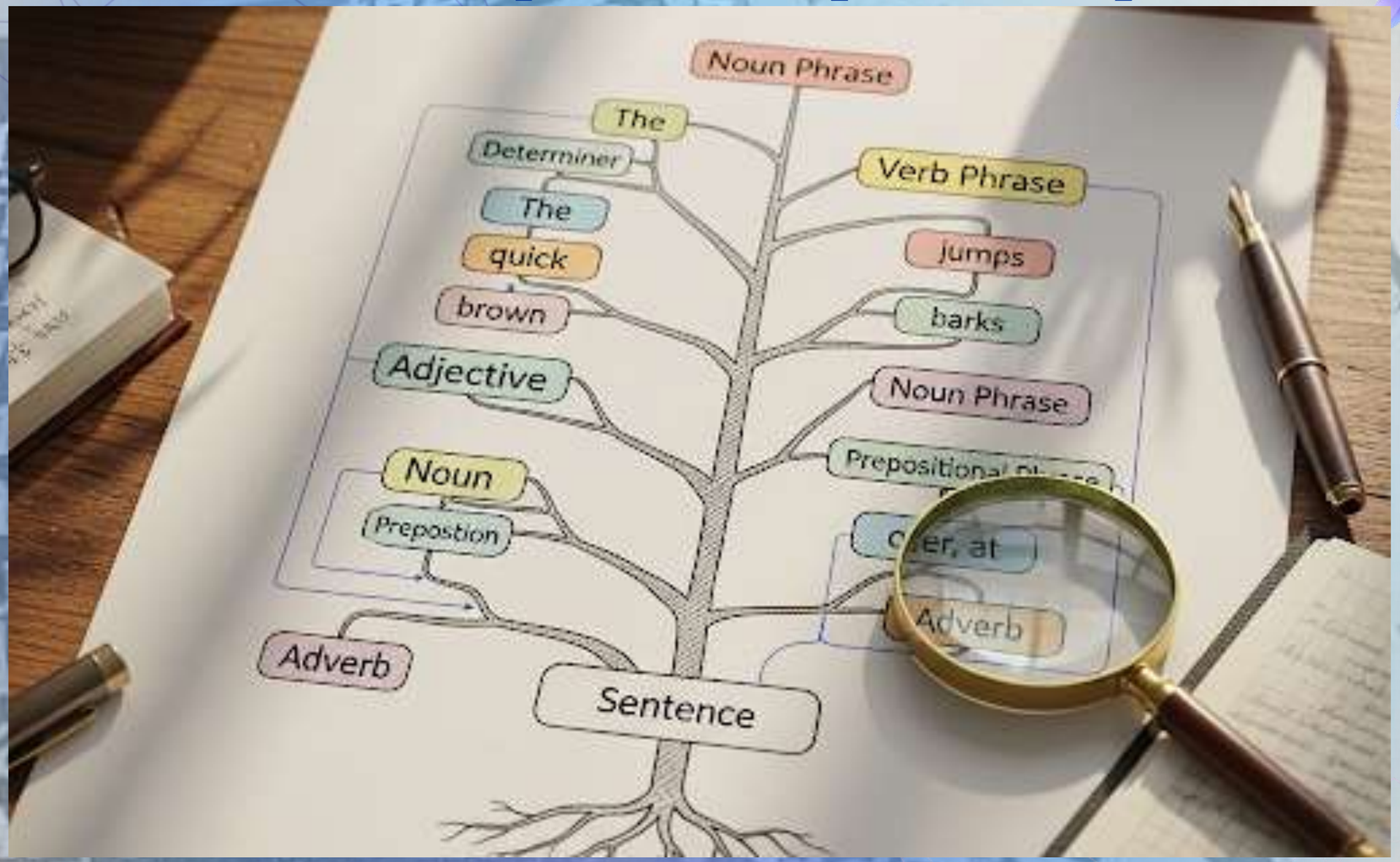
NLP Pipeline (Part 2)



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Why NLP?

- Helps machines make sense of text.
- Used in:

  Spell check

  Translation

  Social media monitoring

  Sentiment analysis

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