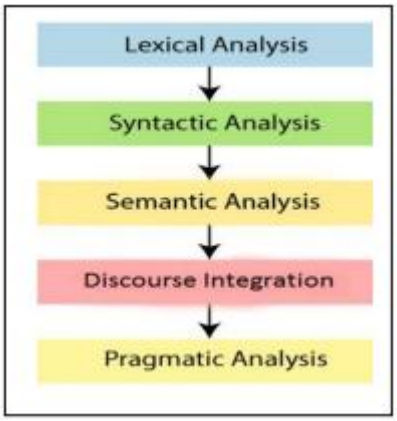
Components of NLP

- There are two components of NLP, Natural Language Understanding (NLU)and Natural Language Generation (NLG).
- Natural Language Understanding (NLU) which involves transforming humanlanguage into a machine-readable format.It helps the machine to understand and analyze human language by extracting the text from large data such as keywords, emotions, relations, and semantics.
- Natural Language Generation (NLG) acts as a translator that converts thecomputerized data into natural language representation.
- It mainly involves Text planning, Sentence planning, and Text realization. ¬ The NLU is harder than NLG.

Steps in NLP There are general five steps :

1. Lexical Analysis
2. Syntactic Analysis (Parsing)
3. Semantic Analysis
4. Discourse Integration
5. Pragmatic Analysis



LEXICAL ANALYSIS:

- The first phase of NLP is the Lexical Analysis.
- This phase scans the source code as a stream of characters and converts it into meaningful lexemes.
- It divides the whole text into paragraphs, sentences, and words.
- Lexeme: A lexeme is a basic unit of meaning. In linguistics, the abstract unit of morphological analysis that corresponds to a set of forms taken by a single word is called lexeme.
- The way in which a lexeme is used in a sentence is determined by its grammatical category.
- Lexeme can be individual word or multiword.
- For example, the word talk is an example of an individual word lexeme, which may have many grammatical variants like talks, talked and talking.
- Multiword lexeme can be made up of more than one orthographic word. For example, speak up, pull through, etc. are the examples of multiword lexemes.

SYNTAX ANALYSIS (PARSING)

• Syntactic Analysis is used to check grammar, word arrangements, and shows therelationship among the words.

• The sentence such as “The school goes to boy” is rejected by English syntactic analyzer.

SEMANTIC ANALYSIS

- Semantic analysis is concerned with the meaning representation.
- It mainly focuses on the literal meaning of words, phrases, and sentences.
- The semantic analyzer disregards sentence such as “hot ice-cream”.
- Another Example is “Manhattan calls out to Dave” passes a syntactic analysis because it’s a grammatically correct sentence. However, it fails a semantic analysis. Because Manhattan is a place (and can’t literally call out to people), the sentence’s meaning doesn’t make sense.

DISCOURSE INTEGRATION

• Discourse Integration depends upon the sentences that precedes it and also invokesthe meaning of the sentences that follow it.

• For instance, if one sentence reads, “Manhattan speaks to all its people,” and the following sentence reads, “It calls out to Dave,” discourse integration checks the first sentence for context to understand that “It” in the latter sentence refers to Manhattan.

PRAGMATIC ANALYSIS

- During this, what was said is re-interpreted on what it actually meant.
- It involves deriving those aspects of language which require real world knowledge.
- For instance, a pragmatic analysis can uncover the intended meaning of “Manhattan speaks to all its people.” Methods like neural networks assess the context to understand that the sentence isn’t literal, and most people won’t interpret it as such. A pragmatic analysis deduces that this sentence is a metaphor for how people emotionally connect with place.