

Experiment: 9

AIM: Perform word sense disambiguation using WordNet.

OBJECTIVES: To perform **Word Sense Disambiguation (WSD)** using **WordNet** with the help of the **Lesk algorithm** implemented in NLTK.

REQUIREMENTS: Python (version 3.x or above), NLTK library, WordNet.

THEORY:

Natural Language Processing (NLP) enables computers to understand and process human language, but the inherent ambiguity of language poses a significant challenge. Words often have multiple meanings depending on the context in which they appear. Word Sense Disambiguation (WSD) is a crucial task in NLP that aims to resolve this ambiguity by determining the correct sense of a word within a given context.

Word Sense Disambiguation is the process of determining the intended meaning, or sense, of a word within a specific context. It involves mapping words to their appropriate sense in a given context to ensure accurate interpretation and understanding of text. WSD is particularly important in applications such as machine translation, information retrieval, question answering systems, sentiment analysis, and natural language understanding.

Example: "I went to the **bank** to deposit money." → financial institution
"He sat on the **bank** of the river." → land alongside a river

WSD has many practical applications, including **machine translation**, **information retrieval**, and **text-to-speech systems**. Improvements in WSD can lead to more accurate and efficient natural language processing systems.

Implementation of Word Sense Disambiguation using WordNet

Step 1: Importing necessary libraries.

```
import nltk
nltk.download('wordnet')
nltk.download('punkt')
from nltk.wsd import lesk
from nltk.tokenize import word_tokenize
from nltk.corpus import wordnet as wn

[nltk_data] Downloading package wordnet to
[nltk_data] C:\Users\tdhan\AppData\Roaming\nltk_data...
[nltk_data] Package wordnet is already up-to-date!
[nltk_data] Downloading package punkt to
[nltk_data] C:\Users\tdhan\AppData\Roaming\nltk_data...
[nltk_data] Package punkt is already up-to-date!
```

Step 2: Taking Input Sentence and dividing them in form of tokens. And Then apply

```
sentence2 = "I going to park the car near shop."  
tokens2 = word_tokenize(sentence2)  
sense2 = lesk(tokens2, "park")  
  
print("Disambiguated Sense:")  
print("Synset Name:", sense2.name())  
print("Definition:", sense2.definition())  
  
Disambiguated Sense:  
Synset Name: parking_lot.n.01  
Definition: a lot where cars are parked
```

Conclusion

In this experiment, we performed **Word Sense Disambiguation** using the **Lesk algorithm** with **WordNet** in NLTK. The algorithm selects the most appropriate meaning of a word based on sentence context and is a fundamental technique in tasks such as **semantic analysis**, **question answering**, and **contextual text understanding**.