### ****What is Word Sense Disambiguation (WSD)?****

WSD is the process of identifying which **sense (meaning)** of a word is used in a sentence.

Many words have **multiple meanings** (polysemy).

Example:

Bank (financial institution) vs. Bank (riverbank)

### ****Goal of the Project****

Build a **command-line tool** using **Python and NLTK**.

Identify ambiguous words in a sentence.

Use **NLTK’s Lesk algorithm** to predict the correct **WordNet sense**.

Output the **definition** and **examples** for the word’s meaning.

### ****Technologies Used****

🐍 **Python 3**

📚 **NLTK (Natural Language Toolkit)**

📖 **WordNet** Lexical Database

### ****Required Libraries & Setup****

Install NLTK:  
pip install nltk

Download required NLTK data:

python

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import nltk

nltk.download('punkt')

nltk.download('wordnet')

nltk.download('averaged\_perceptron\_tagger')

### ****How the Tool Works****

Tokenize sentence with word\_tokenize()

Tag POS with pos\_tag()

Apply **Lesk algorithm**:  
lesk(sentence, target\_word)

Output:

WordNet sense name

Definition

Example usages

### ****Example Usage 1****

Command:

bash

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python app.py "He works at the bank downtown." --word bank

Output:

makefile

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Sense: bank.n.09 Definition: a financial institution... Example: he cashed a check at the bank

### ****Example Usage 2****

Command:

bash

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python app.py "She sat by the bank and watched the river flow." --word bank

Output:

vbnet

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Sense: bank.n.01 Definition: sloping land beside a body of water Example: they pulled the canoe up on the bank

### ****Project Highlights****

Works for **any sentence** and **target word**

Supports **multiple meanings**

Simple and **educational NLP tool**

Demonstrates **contextual analysis**

### ****Conclusion****

Successfully built a tool for **Word Sense Disambiguation**

Useful in NLP tasks like:

Chatbots

Translation

Text summarization

Shows how **context affects word meaning**