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import nltk
from nltk.tokenize import WhitespaceTokenizer, WordPunctTokenizer, TreebankWordTokenizer, TweetTokenizer, MWETokenizer
from nltk.stem import PorterStemmer, SnowballStemmer, WordNetLemmatizer
import string

# Download NLTK resources
nltk.download('punkt')
nltk.download('wordnet')

# Sample text
text = '''NLTK is a powerful Python library for natural language processing tasks
        It provides easy-to-use interfaces to over 50 corpora and lexical resources, such as WordNet, along with a suite of text processing lib
for classification, tokenization, stemming, tagging, parsing,
and semantic reasoning, wrappers for industrial-strength NLP libraries,
and an active discussion forum.'''

# Tokenization methods
tokenizers = {
    "Whitespace Tokenizer": WhitespaceTokenizer(),
    "Punctuation-based Tokenizer": WordPunctTokenizer(),
    "Treebank Tokenizer": TreebankWordTokenizer(),
    "Tweet Tokenizer": TweetTokenizer(),
    "MWE Tokenizer": MWETokenizer(),
}

# Stemmers
porter_stemmer = PorterStemmer()
snowball_stemmer = SnowballStemmer("english")

# Lemmatizer
lemmatizer = WordNetLemmatizer()


# Tokenization
for name, tokenizer in tokenizers.items():
    tokens = tokenizer.tokenize(text)
    print(f"\n{name}:")
    print(tokens)

# Stemming
print("\nPorter Stemmer:")
porter_stems = [porter_stemmer.stem(token) for token in tokens]
print(porter_stems)

print("\nSnowball Stemmer:")
snowball_stems = [snowball_stemmer.stem(token) for token in tokens]
print(snowball_stems)

# Lemmatization
print("\nLemmatization:")
lemmas = [lemmatizer.lemmatize(token) for token in tokens]
print(lemmas)

```

 [nltk\_data] Downloading package punkt to /root/nltk\_data...  
 [nltk\_data] Unzipping tokenizers/punkt.zip.  
 [nltk\_data] Downloading package wordnet to /root/nltk\_data...

Whitespace Tokenizer:  
 ['NLTK', 'is', 'a', 'powerful', 'Python', 'library', 'for', 'natural', 'language', 'processing', 'tasks', 'It', 'provides', 'easy-to-use']

Punctuation-based Tokenizer:  
 ['NLTK', 'is', 'a', 'powerful', 'Python', 'library', 'for', 'natural', 'language', 'processing', 'tasks', 'It', 'provides', 'easy', '-',]

Treebank Tokenizer:  
 ['NLTK', 'is', 'a', 'powerful', 'Python', 'library', 'for', 'natural', 'language', 'processing', 'tasks', 'It', 'provides', 'easy-to-use']

Tweet Tokenizer:  
 ['NLTK', 'is', 'a', 'powerful', 'Python', 'library', 'for', 'natural', 'language', 'processing', 'tasks', 'It', 'provides', 'easy-to-use']

MWE Tokenizer:  
 ['N', 'L', 'T', 'K', ' ', ' ', 'i', 's', ' ', ' ', 'a', ' ', ' ', 'p', 'o', 'w', 'e', 'r', 'f', 'u', 'l', ' ', ' ', 'P', 'y', 't', 'h', 'o', 'n', ' ', ' ', 'l',]

Porter Stemmer:  
 ['n', 'l', 't', 'k', ' ', ' ', 'i', 's', ' ', ' ', 'a', ' ', ' ', 'p', 'o', 'w', 'e', 'r', 'f', 'u', 'l', ' ', ' ', 'p', 'y', 't', 'h', 'o', 'n', ' ', ' ', 'l',]

Snowball Stemmer:  
 ['n', 'l', 't', 'k', ' ', ' ', 'i', 's', ' ', ' ', 'a', ' ', ' ', 'p', 'o', 'w', 'e', 'r', 'f', 'u', 'l', ' ', ' ', 'p', 'y', 't', 'h', 'o', 'n', ' ', ' ', 'l',]