

```
!pip install nltk spacy
```

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Requirement already satisfied: nltk in /usr/local/lib/python3.12/dist-packages (3.9.1)
Requirement already satisfied: spacy in /usr/local/lib/python3.12/dist-packages (3.8.11)
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Requirement already satisfied: wrapt in /usr/local/lib/python3.12/dist-packages (from smart-open<
```

```
# Import libraries
import nltk
import spacy
from nltk.corpus import gutenberg
from nltk.tokenize import sent_tokenize, word_tokenize
from nltk.stem.porter import PorterStemmer
from nltk.stem import WordNetLemmatizer
```

```
# Download NLTK resources
nltk.download('punkt')
nltk.download('gutenberg')
nltk.download('wordnet')
nltk.download('omw-1.4')
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]  Unzipping tokenizers/punkt.zip.
[nltk_data] Downloading package gutenberg to /root/nltk_data...
[nltk_data]  Unzipping corpora/gutenberg.zip.
[nltk_data] Downloading package wordnet to /root/nltk_data...
[nltk_data] Downloading package omw-1.4 to /root/nltk_data...
True
```

```
medical_text = """
Diabetes is a chronic disease that affects how the body processes blood sugar.
If untreated, diabetes may cause heart disease, kidney failure, nerve damage and vision problems.
Early diagnosis and proper treatment help improve patient outcomes.
"""
```

```
import nltk
from nltk.tokenize import sent_tokenize
nltk.download('punkt_tab')
sentences = sent_tokenize(medical_text)
sentences
```

```
[nltk_data] Downloading package punkt_tab to /root/nltk_data...
[nltk_data]  Unzipping tokenizers/punkt_tab.zip.
['\nDiabetes is a chronic disease that affects how the body processes blood sugar.',
 'If untreated, diabetes may cause heart disease, kidney failure, nerve damage and vision
problems.',
 'Early diagnosis and proper treatment help improve patient outcomes.']

```

```
words = word_tokenize(medical_text)
words
```

```
['Diabetes',
 'is',
 'a',
 'chronic',
 'disease',
 'that',
 'affects',
 'how',
 'the',
 'body',
 'processes',
 'blood',
 'sugar',
 '.',
 'If',
 'untreated',
 ',',
 'diabetes',
 'may',
 'cause',
 'heart',
 'disease',
 ',',
 'kidney',
 'failure',
 ',',
 'nerve',
 'damage',
 'and',
 'vision',
 'problems',
 '.',
 'Early',
 'diagnosis',
 'and',
 'proper',
 'treatment',
 'help',
 'improve',
 'patient',
```

```
'outcomes',  
'..']
```

```
stemmer = PorterStemmer()  
stemmed_words = [stemmer.stem(word) for word in words]  
stemmed_words
```

```
['diabet',  
'is',  
'a',  
'chronic',  
'diseas',  
'that',  
'affect',  
'how',  
'the',  
'bodi',  
'process',  
'blood',  
'sugar',  
'..',  
'if',  
'untreat',  
'..',  
'diabet',  
'may',  
'caus',  
'heart',  
'diseas',  
'..',  
'kidney',  
'failur',  
'..',  
'nerv',  
'damag',  
'and',  
'vision',  
'problem',  
'..',  
'earli',  
'diagnosi',  
'and',  
'proper',  
'treatment',  
'help',  
'improv',  
'patient',  
'outcom',  
'..']
```

```
lemmatizer = WordNetLemmatizer()  
lemmatized_words = [lemmatizer.lemmatize(word.lower()) for word in words if word.isalpha()]  
lemmatized_words
```

```
['diabetes',  
'is',  
'a',  
'chronic',  
'disease',  
'that',  
'affect',  
'how',  
'the',  
'body',  
'process',  
'..']
```

```
'blood',
'sugar',
'if',
'untreated',
'diabetes',
'may',
'cause',
'heart',
'disease',
'kidney',
'failure',
'nerve',
'damage',
'and',
'vesion',
'problem',
'early',
'diagnosis',
'and',
'proper',
'treatment',
'help',
'improve',
'patient',
'outcome']
```