```
!pip install nltk
!pip install spacy
!pip install transformers
```

```
Requirement already satisfied: spacy-legacy<3.1.0,>=3.0.11 in /usr/local/lib/python3.10/dist-packages (from spacy) (3.0.12)
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```

```
import nltk
import spacy
from transformers import pipeline
```

```
nltk.download('punkt')
nltk.download('stopwords')
nltk.download('wordnet')
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
[nltk_data] Downloading package wordnet to /root/nltk_data...
[nltk_data]   Package wordnet is already up-to-date!
True
```

```
!python -m spacy download en_core_web_sm
```

```
Collecting en-core-web-sm==3.7.1
  Downloading https://github.com/explosion/spacy-models/releases/download/en_core_web_sm-3.7.1/en_core_web_sm-3.7.1-py3-none-any.whl
                                         12.8/12.8 MB 41.4 MB/s eta 0:00:00
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Requirement already satisfied: jinja2 in /usr/local/lib/python3.10/dist-packages (from spacy<3.8.0,>=3.7.2->en-core-web-sm==3.7.1)
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Requirement already satisfied: language-data>=1.2 in /usr/local/lib/python3.10/dist-packages (from langcodes<4.0.0,>=3.2.0->spacy<3
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Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests<3.0.0,>=2.13.0->spacy<3
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Requirement already satisfied: shellingham>=1.3.0 in /usr/local/lib/python3.10/dist-packages (from typer<1.0.0,>=0.3.0->spacy<3.8.0,
Requirement already satisfied: rich>=10.11.0 in /usr/local/lib/python3.10/dist-packages (from typer<1.0.0,>=0.3.0->spacy<3.8.0,>=3.7
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Requirement already satisfied: smart-open<8.0.0,>=5.2.1 in /usr/local/lib/python3.10/dist-packages (from weasel<0.5.0,>=0.1.0->spacy
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Requirement already satisfied: mdurl~=0.1 in /usr/local/lib/python3.10/dist-packages (from markdown-it-py>=2.2.0->rich>=10.11.0->typ
✓ Download and installation successful
You can now load the package via spacy.load('en_core_web_sm')
⚠ Restart to reload dependencies
If you are in a Jupyter or Colab notebook, you may need to restart Python in
order to load all the package's dependencies. You can do this by selecting the
'Restart kernel' or 'Restart runtime' option.
```

```python
from nltk.tokenize import word_tokenize
text = "Hello, how are you?"
tokens = word_tokenize(text)
print(tokens)
```

```
['Hello', ',', 'how', 'are', 'you', '?']
```

```python
from nltk.corpus import stopwords
stop_words = set(stopwords.words('english'))
filtered_tokens = [word for word in tokens if word.lower() not in stop_words]
print(filtered_tokens)
```

```
['Hello', ',', '?']
```

```python
from nltk.corpus import stopwords
stop_words = set(stopwords.words('english'))
filtered_tokens = [word for word in tokens if word.lower() not in stop_words]
print(filtered_tokens)
```

```
['Hello', ',', '?']
```

```python
import spacy
nlp = spacy.load('en_core_web_sm')
doc = nlp("Hello, how are you?")
for token in doc:
    print(token.text, token.lemma_, token.pos_, token.dep_)
```

```
Hello hello INTJ intj
, , PUNCT punct
how how SCONJ advmod
are be AUX ROOT
you you PRON nsubj
? ? PUNCT punct
```

```python
from transformers import pipeline
classifier = pipeline('sentiment-analysis')
result = classifier("I love using Google Colab for NLP tasks!")
print(result)
```

No model was supplied, defaulted to distilbert/distilbert-base-uncased-finetuned-sst-2-english and revision af0f99b (https://huggin
Using a pipeline without specifying a model name and revision in production is not recommended.
[{'label': 'POSITIVE', 'score': 0.9920926690101624}]

```python
# Example text
text = "Google Colab is a great platform for performing Natural Language Processing tasks."

# Tokenization
tokens = word_tokenize(text)
print("Tokens:", tokens)

# Stopwords Removal
filtered_tokens = [word for word in tokens if word.lower() not in stop_words]
print("Filtered Tokens:", filtered_tokens)

# Lemmatization using spaCy
doc = nlp(" ".join(filtered_tokens))
lemmas = [token.lemma_ for token in doc]
print("Lemmas:", lemmas)

# Sentiment Analysis
result = classifier(" ".join(lemmas))
print("Sentiment Analysis Result:", result)
```

```
Tokens: ['Google', 'Colab', 'is', 'a', 'great', 'platform', 'for', 'performing', 'Natural', 'Language', 'Processing', 'tasks', '.']
Filtered Tokens: ['Google', 'Colab', 'great', 'platform', 'performing', 'Natural', 'Language', 'Processing', 'tasks', '.']
Lemmas: ['Google', 'Colab', 'great', 'platform', 'perform', 'Natural', 'Language', 'Processing', 'task', '.']
Sentiment Analysis Result: [{'label': 'POSITIVE', 'score': 0.9719940423965454}]
```