

```
!pip install nltk spacy
```

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Requirement already satisfied: nltk in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: spacy in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: click in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: joblib in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: tqdm in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: spacy-legacy<3.1.0,>=3.0.11 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: spacy-loggers<2.0.0,>=1.0.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: murmurhash<1.1.0,>=0.28.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: cymem<2.1.0,>=2.0.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: preshed<3.1.0,>=3.0.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: thinc<8.4.0,>=8.3.4 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: wasabi<1.2.0,>=0.9.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: srslly<3.0.0,>=2.4.3 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: catalogue<2.1.0,>=2.0.6 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: weasel<0.5.0,>=0.4.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: typer-slim<1.0.0,>=0.3.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: numpy>=1.19.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: requests<3.0.0,>=2.13.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: pydantic!=1.8,!>1.8.1,<3.0.0,>=1.7.4 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: jinja2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: pydantic-core==2.41.4 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: typing-extensions>=4.14.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: typing-inspection>=0.4.2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: charset_normalizer<4,>=2 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: blis<1.4.0,>=1.3.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: confection<1.0.0,>=0.0.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: cloudpathlib<1.0.0,>=0.7.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: smart-open<8.0.0,>=5.2.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: wrapt in /usr/local/lib/python3.12/dist-packages
```

```
import nltk
import spacy
```

```
text = """Natural Language Processing (NLP) is a branch of Artificial Intelligence that deals with the interaction between computers and humans in terms of language. It involves the study of how computers can process and analyze human language, and how they can generate meaningful responses. NLP has many applications, such as speech recognition, machine translation, sentiment analysis, and text summarization. It requires a combination of linguistics, computer science, and mathematics to develop effective NLP systems.
```

```
words = text.split()
word_count = len(words)
print("Number of words:", word_count)
```

Number of words: 35

```
lower_text = text.lower()  
print("Text in lowercase:\n")  
print(lower_text)
```

Text in lowercase:

natural language processing (nlp) is a branch of artificial intelligence (ai)