Start coding or generate with AI.

∨ Task 1: Install and Import Essential NLP Libraries

```
!pip install nltk
```

```
Requirement already satisfied: nltk in /usr/local/lib/python3.12/dist-packages (3.9.1)
Requirement already satisfied: click in /usr/local/lib/python3.12/dist-packages (from nltk) (8.3.1
Requirement already satisfied: joblib in /usr/local/lib/python3.12/dist-packages (from nltk) (1.5.
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.12/dist-packages (from nl
Requirement already satisfied: tqdm in /usr/local/lib/python3.12/dist-packages (from nltk) (4.67.1
```

```
!pip install spacy
```

```
Requirement already satisfied: spacy in /usr/local/lib/python3.12/dist-packages (3.8.11)
Requirement already satisfied: spacy-legacy<3.1.0,>=3.0.11 in /usr/local/lib/python3.12/dist-packa
Requirement already satisfied: spacy-loggers<2.0.0,>=1.0.0 in /usr/local/lib/python3.12/dist-packa
Requirement already satisfied: murmurhash<1.1.0,>=0.28.0 in /usr/local/lib/python3.12/dist-package
Requirement already satisfied: cymem<2.1.0,>=2.0.2 in /usr/local/lib/python3.12/dist-packages (fro
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Requirement already satisfied: thinc<8.4.0,>=8.3.4 in /usr/local/lib/python3.12/dist-packages (fro
Requirement already satisfied: wasabi<1.2.0,>=0.9.1 in /usr/local/lib/python3.12/dist-packages (fr
Requirement already satisfied: srsly<3.0.0,>=2.4.3 in /usr/local/lib/python3.12/dist-packages (fro
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 (fr
Requirement already satisfied: typer-slim<1.0.0,>=0.3.0 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: tqdm<5.0.0,>=4.38.0 in /usr/local/lib/python3.12/dist-packages (fro
Requirement already satisfied: numpy>=1.19.0 in /usr/local/lib/python3.12/dist-packages (from spac
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/d
Requirement already satisfied: jinja2 in /usr/local/lib/python3.12/dist-packages (from spacy) (3.1
Requirement already satisfied: setuptools in /usr/local/lib/python3.12/dist-packages (from spacy)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.12/dist-packages (from sp
Requirement already satisfied: annotated-types>=0.6.0 in /usr/local/lib/python3.12/dist-packages (
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Requirement already satisfied: typing-extensions>=4.14.1 in /usr/local/lib/python3.12/dist-package
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 (from reque
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.12/dist-packages (from
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.12/dist-packages (from
Requirement already satisfied: blis<1.4.0,>=1.3.0 in /usr/local/lib/python3.12/dist-packages (from
Requirement already satisfied: confection<1.0.0,>=0.0.1 in /usr/local/lib/python3.12/dist-packages
Requirement already satisfied: click>=8.0.0 in /usr/local/lib/python3.12/dist-packages (from typer
Requirement already satisfied: cloudpathlib<1.0.0,>=0.7.0 in /usr/local/lib/python3.12/dist-packag
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 (from ji
Requirement already satisfied: wrap in /usr/local/lib/python3.12/dist-packages (from smart-open<8
```

```python
import nltk
import spacy

# Download necessary NLTK data (punkt tokenizer for word tokenization and punkt_tab for tokenizin
nltk.download('punkt')
nltk.download('punkt_tab')

# Download spaCy's English model
!python -m spacy download en_core_web_sm
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]    Package punkt is already up-to-date!
[nltk_data] Downloading package punkt_tab to /root/nltk_data...
[nltk_data]    Unzipping tokenizers/punkt_tab.zip.
Collecting en-core-web-sm==3.8.0
  Downloading https://github.com/explosion/spacy-models/releases/download/en_core_web_sm-3.8.0/en_
  ──────────────────────────────────────── 12.8/12.8 MB 125.6 MB/s eta 0:00:00
✓ 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.
```

Task 2: Load a Short Paragraph

```python
paragraph = """Natural language processing (NLP) is a subfield of linguistics, computer science,

print(paragraph)
```

```
Natural language processing (NLP) is a subfield of linguistics, computer science, and artificial i
```

Task 3: Perform Simple Preprocessing

```python
# Count the number of words
words = nltk.word_tokenize(paragraph)
word_count = len(words)
print(f"Number of words: {word_count}")
```

```
Number of words: 73
```

```python
# Convert the entire text to lowercase
lowercase_paragraph = paragraph.lower()
print(f"Lowercase text:\n{lowercase_paragraph}")
```

```
Lowercase text:
natural language processing (nlp) is a subfield of linguistics, computer science, and artificial i
```