In [1]:
```
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.stem import PorterStemmer
```

In [2]:
```
nltk.download('punkt')
nltk.download('stopwords')
```

```
[nltk_data] Downloading package punkt to
[nltk_data]     C:\Users\dell\AppData\Roaming\nltk_data...
[nltk_data]   Package punkt is already up-to-date!
[nltk_data] Downloading package stopwords to
[nltk_data]     C:\Users\dell\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

Out[2]: True

In [9]:
```
def preprocess_text(text):
    ps = PorterStemmer()

    words = word_tokenize(text)

    stop_words = set(stopwords.words('english'))
    filtered_words = [word for word in words if word.lower() not in stop_words]

    stemmed_words = [ps.stem(word) for word in filtered_words]

    return ' '.join(stemmed_words)
```

In [10]:
```
sample_text = """
Natural language processing (NLP) is a subfield of artificial intelligence (AI)
"""
```

In [11]:
```
processed_text = preprocess_text(sample_text)
```

In [12]:
```
print("Original Text:\n", sample_text)
print("\nProcessed Text:\n", processed_text)
```

```
Original Text:

Natural language processing (NLP) is a subfield of artificial intelligence (AI)
that focuses on the interaction between computers and humans through language.


Processed Text:
 natur languag process ( nlp ) subfield artifici intellig ( ai ) focus interact
comput human languag .
```

In [ ]: