Library required

```
!pip install nltk
```

```
Requirement already satisfied: nltk in /usr/local/lib/python3.10/dist-packages (3.8.1)
Requirement already satisfied: click in /usr/local/lib/python3.10/dist-packages (from nltk) (8.1.7)
Requirement already satisfied: joblib in /usr/local/lib/python3.10/dist-packages (from nltk) (1.3.2)
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.10/dist-packages (from nltk) (2023.6.3)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from nltk) (4.66.1)
```

Text

```
text = 'TON 618 is a hyperluminous, broad-absorption-line, radio-loud quasar and Lyman-alpha blob located near the border of the constellatio
```

```
text
```

```
'TON 618 is a hyperluminous, broad-absorption-line, radio-loud quasar and Lyman-alpha blob located near the border of the constellations
Berenices, with the projected comoving distance of approximately 18.2 billion light-years from Earth.'
```

Stopwords

```
from nltk.corpus import stopwords
import nltk
nltk.download('stopwords')
```

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

```
stop_words = stopwords.words('english')
```

```
from nltk.tokenize import word_tokenize
import nltk
nltk.download('punkt')
words = word_tokenize(text)
```

```
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]   Unzipping tokenizers/punkt.zip.
```

Applying stop words

```
holder = list()
for w in words:
    if w not in set(stop_words):
        holder.append(w)
```

```
holder
```

```
['TON',
 '618',
 'hyperluminous',
 ',',
 'broad-absorption-line',
 ',',
 'radio-loud',
 'quasar',
 'Lyman-alpha',
 'blob',
 'located',
 'near',
 'border',
 'constellations',
 'Canes',
 'Venatici',
 'Coma',
 'Berenices',
 ',',
 'projected',
```

```
 'comoving',
 'distance',
 'approximately',
 '18.2',
 'billion',
 'light-years',
 'Earth',
 '.']
```

List Comprehension for stop words

```
holder = [w for w in words if w not in set(stop_words)]
print(holder)
```

```
['TON', '618', 'hyperluminous', ',', 'broad-absorption-line', ',', 'radio-loud', 'quasar', 'Lyman-alpha', 'blob', 'located', 'near', 'bc
```

Stemming

```
from nltk.stem import PorterStemmer, SnowballStemmer, LancasterStemmer
```

```
porter = PorterStemmer()
snow = SnowballStemmer(language = 'english')
lancaster = LancasterStemmer()
```

```
words = ['play', 'plays', 'played', 'playing', 'player']
```

Porter Stemmer

```
porter_stemmed = list()
for w in words:
    stemmed_words = porter.stem(w)
    porter_stemmed.append(stemmed_words)
```

```
porter_stemmed
```

```
['play', 'play', 'play', 'play', 'player']
```

Porter Stemmer List Comprehension

```
porter_stemmed = [porter.stem(x) for x in words]
print (porter_stemmed)
```

```
['play', 'play', 'play', 'play', 'player']
```

Snowball Stemmer

```
snow_stemmed = list()
for w in words:
    stemmed_words = snow.stem(w)
    snow_stemmed.append(stemmed_words)
```

```
snow_stemmed
```

```
['play', 'play', 'play', 'play', 'player']
```

Snowball Stemmer List Comprehension

```
snow_stemmed = [snow.stem(x) for x in words]
print (snow_stemmed)
```

```
['play', 'play', 'play', 'play', 'player']
```

Lancaster Stemmer

```
lancaster_stemmed = list()
for w in words:
    stemmed_words = lancaster.stem(w)
    lancaster_stemmed.append(stemmed_words)
```

```
lancaster_stemmed
```

```
['play', 'play', 'play', 'play', 'play']
```

Lancaster Stemmer List Comprehension

```
lancaster_stemmed = [lancaster.stem(x) for x in words]
print (lancaster_stemmed)
```

```
['play', 'play', 'play', 'play', 'play']
```

Lemmatization : This has a more expansive vocabulary than Stemming

```
from nltk.stem import WordNetLemmatizer
wordnet = WordNetLemmatizer()
```

```
import nltk
nltk.download('wordnet')
lemmatized = [wordnet.lemmatize(x) for x in words]
```

```
[nltk_data] Downloading package wordnet to /root/nltk_data...
```

```
lemmatized
```

```
['play', 'play', 'played', 'playing', 'player']
```