```
import matplotlib.pyplot as plt
import seaborn as sns
from wordcloud import WordCloud
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
import string


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

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

+ Code + Text

```
df = pd.read_csv('/content/Restaurant_Reviews.tsv', sep='\t')
print("Shape:", df.shape)
df.head()
```

```
Shape: (1000, 2)
```

	Review	Liked
0	Wow... Loved this place.	1
1	Crust is not good.	0
2	Not tasty and the texture was just nasty.	0
3	Stopped by during the late May bank holiday of...	1
4	The selection on the menu was great and so wer...	1

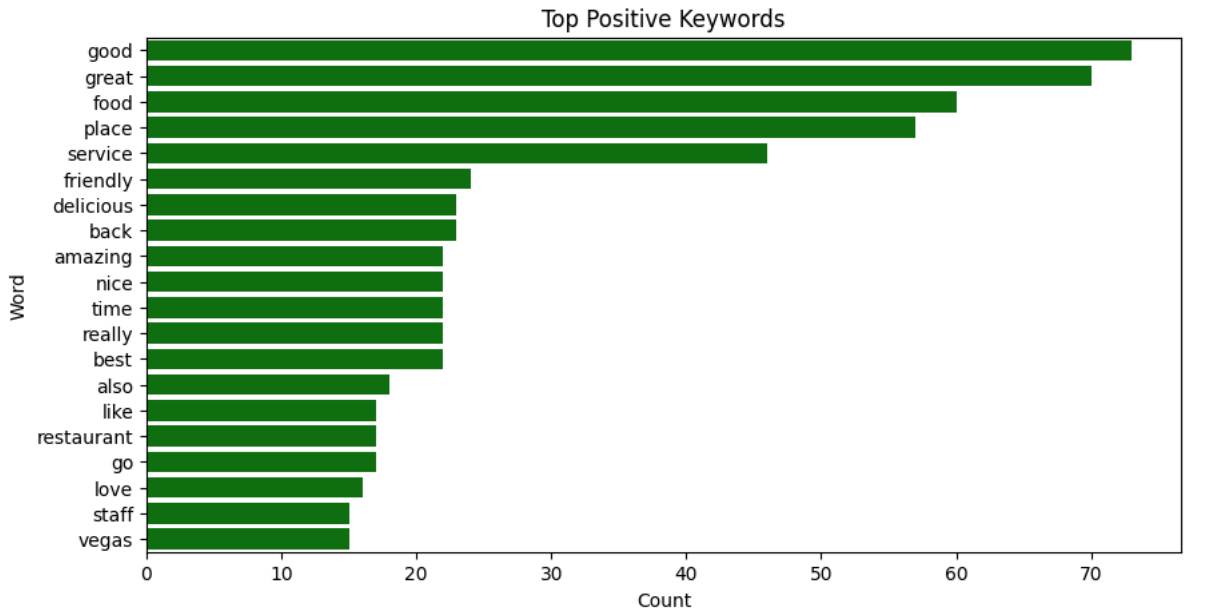
```
nltk.download('punkt')
nltk.download('stopwords')
nltk.download('punkt_tab')

df = pd.read_csv('/content/Restaurant_Reviews.tsv', sep='\t')

print("Shape:", df.shape)
df.head()

stop_words = set(stopwords.words('english'))
def clean_text(text):
    text = text.lower()
    tokens = word_tokenize(text)
    cleaned = [word for word in tokens if word.isalpha() and word not in stop_words]
    return " ".join(cleaned)
```

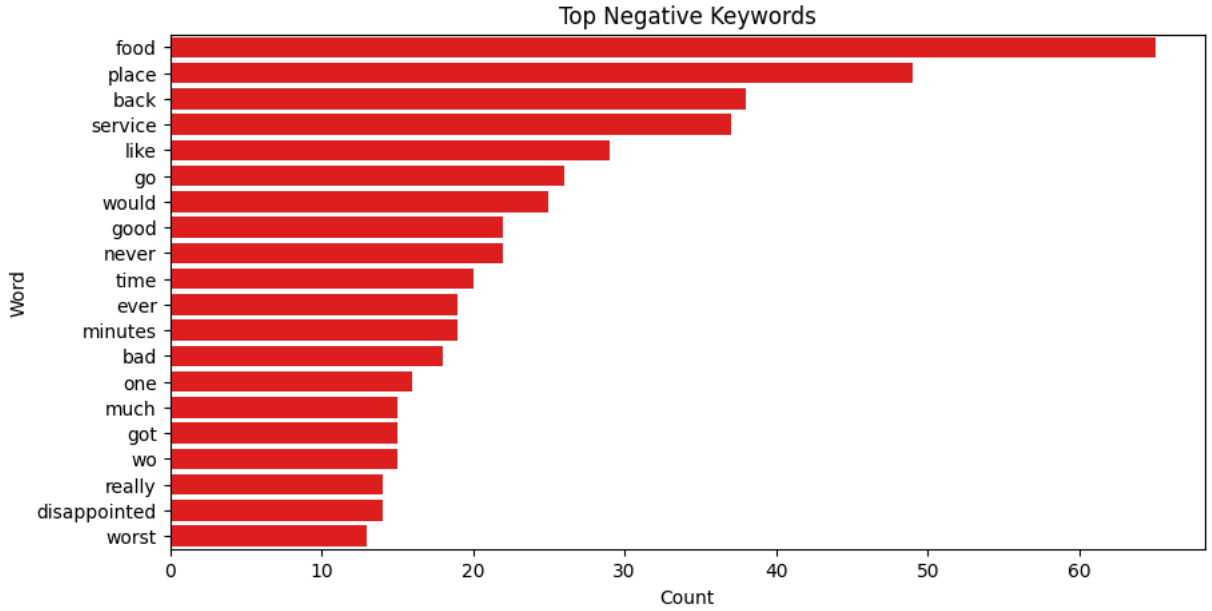
```
df['cleaned_review'] = df['Review'].apply(clean_text)
df[['Review', 'cleaned_review']].head()
```

```
[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 punkt_tab to /root/nltk_data...
[nltk_data]   Unzipping tokenizers/punkt_tab.zip.
Shape: (1000, 2)
```

	Review	cleaned_review
0	Wow... Loved this place.	wow loved place
1	Crust is not good.	crust good
2	Not tasty and the texture was just nasty.	tasty texture nasty
3	Stopped by during the late May bank holiday of...	stopped late may bank holiday rick steve recom...
4	The selection on the menu was great and so wer...	selection menu great prices

```
from collections import Counter


positive_reviews = df[df['Liked'] == 1]['cleaned_review']
negative_reviews = df[df['Liked'] == 0]['cleaned_review']

positive_words = " ".join(positive_reviews).split()
negative_words = " ".join(negative_reviews).split()

positive_freq = Counter(positive_words).most_common(20)
negative_freq = Counter(negative_words).most_common(20)

pos_df = pd.DataFrame(positive_freq, columns=['Word', 'Count'])
neg_df = pd.DataFrame(negative_freq, columns=['Word', 'Count'])



plt.figure(figsize=(10,5))
sns.barplot(data=pos_df, x='Count', y='Word', color='green')
plt.title('Top Positive Keywords')
plt.show()


plt.figure(figsize=(10,5))
sns.barplot(data=neg_df, x='Count', y='Word', color='red')
plt.title('Top Negative Keywords')
plt.show()
```





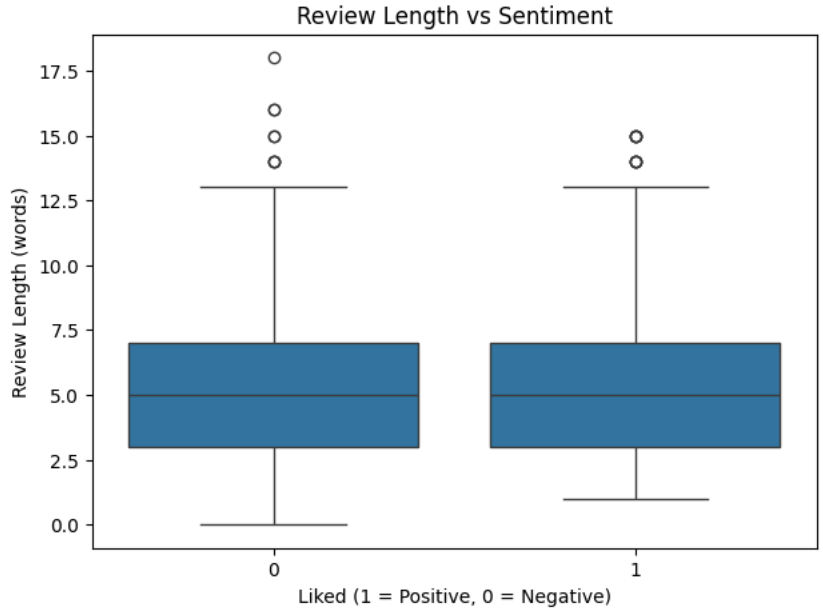

```
df['review_length'] = df['cleaned_review'].apply(lambda x: len(x.split()))

avg_len = df['review_length'].mean()
```

```
print(f"Average Review Length: {avg_len:.2f} words")
```

```
Average Review Length: 5.45 words
```

```
plt.figure(figsize=(7,5))
sns.boxplot(x='Liked', y='review_length', data=df)
plt.title('Review Length vs Sentiment')
plt.xlabel('Liked (1 = Positive, 0 = Negative)')
plt.ylabel('Review Length (words)')
plt.show()
```

```
correlation = df['Liked'].corr(df['review_length'])
print(f"Correlation between review length and sentiment (Liked): {correlation:.2f}")
```




```
Correlation between review length and sentiment (Liked): -0.04
```