```python
import pandas as pd

data = pd.read_csv('/content/McDonald_s_Reviews.csv',encoding = 'latin-1')

data.head(5)
```

	reviewer_id	store_name	category	store_address	latitude	longitude	rating_count	review_time	review	rating
0	1	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	1,240	3 months ago	Why does it look like someone spit on my food?...	1 star
1	2	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	1,240	5 days ago	It'd McDonalds. It is what it is as far as the...	4 stars
2	3	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	1,240	5 days ago	Made a mobile order got to the speaker and che...	1 star

```python
mcd = data.groupby('review_time')['review'].apply(' '.join)
mcd = pd.DataFrame(mcd)
mcd.reset_index(inplace = True)
```

```python
mcd.head(20)
```

	review_time	review
0	10 months ago	Can't believe experience with order taker. Wen...
1	10 years ago	Service, overall, better than most McDs. McDon...
2	11 months ago	If you didnï¿½...
3	11 years ago	Slow service Terrible They renovated their sto...
4	12 years ago	Neutral When breakfast was over the manager ca...
5	2 days ago	Brodheadsville, Pa.\n\nLast time this location...
6	2 months ago	I repeat my order 3 times in the drive thru, a...
7	2 weeks ago	Slowest place and folks do t care. Excellent ...
8	2 years ago	(Sarcasm) this was exactly what I ordered! A 2...
9	20 hours ago	They always mess up orders or give you the wro...
10	21 hours ago	My kids favorite Fresh food
11	22 hours ago	Terrible
12	23 hours ago	This McDonald's does 1 order per hour after mi...
13	3 days ago	bad The fries were overcooked and tasted burnt...
14	3 months ago	Why does it look like someone spit on my food?...
15	3 weeks ago	I work for door dash and they locked us all ou...
16	3 years ago	First and last time I go to this location. Loo...
17	4 days ago	It is a 24 hr location, when I arrived and tri...
18	4 months ago	Didnï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½...
19	4 weeks ago	Excellent Service on the most part is better ...

Sentiment analysis

```python
!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) (1.4.0)
```

```
        Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.10/dist-packages (from nltk) (2023.12.25)
        Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from nltk) (4.66.2)
```

```python
import nltk
nltk.download('vader_lexicon')
```

```
[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
True
```

```python
from nltk.sentiment.vader import SentimentIntensityAnalyzer
```

```python
sia = SentimentIntensityAnalyzer()
```

```python
sentiments = []
for review in mcd['review']:
    sentiment = sia.polarity_scores(review)
    sentiments.append(sentiment)
```

```python
sentiment_labels = []
for sentiment in sentiments:
    compound_score = sentiment['compound']
    if compound_score >= 0.05:
        sentiment_labels.append('Positive')
    elif compound_score <= -0.05:
        sentiment_labels.append('Negative')
    else:
        sentiment_labels.append('Neutral')
```

```python
mcd['sentiment'] = sentiment_labels
```
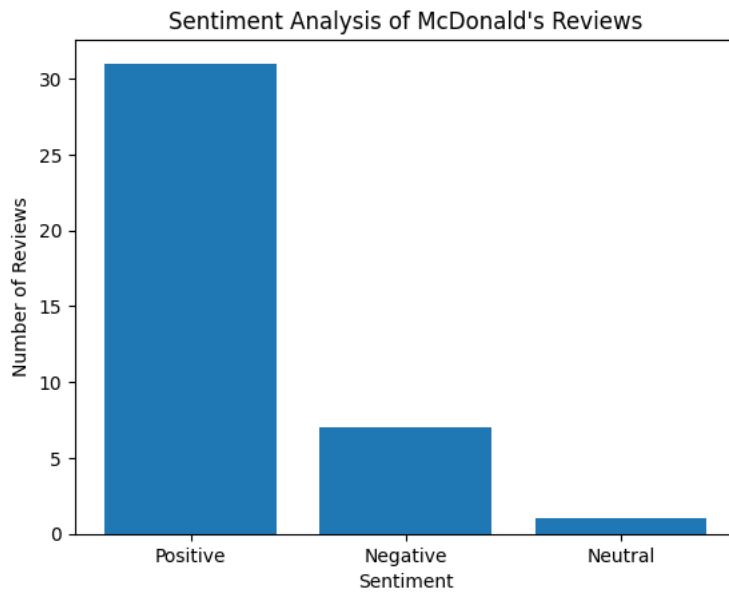
```python
mcd[['review', 'sentiment']]
```

|	review	sentiment
0	Can't believe experience with order taker. Wen...	Positive
1	Service, overall, better than most McDs. McDon...	Positive
2	If you didnï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï...	Positive
3	Slow service Terrible They renovated their sto...	Negative
4	Neutral When breakfast was over the manager ca...	Positive
5	Brodheadsville, Pa.\n\nLast time this location...	Positive
6	I repeat my order 3 times in the drive thru, a...	Positive
7	Slowest place and folks do t care. Excellent ...	Positive
8	(Sarcasm) this was exactly what I ordered! A 2...	Positive
9	They always mess up orders or give you the wro...	Negative
10	My kids favorite Fresh food	Positive
11	Terrible	Negative
12	This McDonald's does 1 order per hour after mi...	Neutral
13	bad The fries were overcooked and tasted burnt...	Positive
14	Why does it look like someone spit on my food?...	Positive
15	I work for door dash and they locked us all ou...	Positive
16	First and last time I go to this location. Loo...	Positive
17	It is a 24 hr location, when I arrived and tri...	Negative
18	Didnï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½½...	Positive
19	Excellent Service on the most part is better ...	Positive
20	Meh.. just meh. When I finally get the correct...	Positive
21	It'd McDonalds. It is what it is as far as the...	Positive
22	Ordered food burger wrong and left out part of...	Positive
23	waited in the drive through for over half an h...	Positive
24	Good Lied and said they were out of foodï¿½ï¿½...	Positive
25	I came here for a Uber eats order and their sy...	Positive
26	We stopped by for a quick breakfast. It was n...	Positive
27	Horrible customer service always gets my order...	Positive
28	I am not happy at all today I went and bought ...	Positive
29	Nothing! Staff was rude. No napkins out, table...	Negative
30	Worst customer service ever	Negative
31	This is consistently the worst meal you will p...	Positive
32	seriously I had asked specifically no onion on...	Negative
33	This location is wack.\nThey will literally st...	Positive
34	The stuff I hear is disgusting This mickey'd s...	Positive
35	Excellent They say theyï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï¿½ï...	Positive
36	My mc. Crispy chicken sandwich was ï¿½ï¿½ï¿½ï¿½...	Positive
37	Excellent They are not 24hrs them doors are l...	Positive
38	Came in and ordered a Large coffee w/no ice. T...	Positive

```python
import matplotlib.pyplot as plt

# Create a bar chart showing the number of reviews for each sentiment
sentiment_counts = mcd['sentiment'].value_counts()
plt.bar(sentiment_counts.index, sentiment_counts.values)
plt.xlabel('Sentiment')
plt.ylabel('Number of Reviews')
plt.title('Sentiment Analysis of McDonald\'s Reviews')
plt.show()

# Create a pie chart showing the percentage of reviews for each sentiment
plt.pie(sentiment_counts.values, labels=sentiment_counts.index, autopct='%1.1f%%')
plt.title('Sentiment Analysis of Rest M\'s Reviews')
plt.show()
```
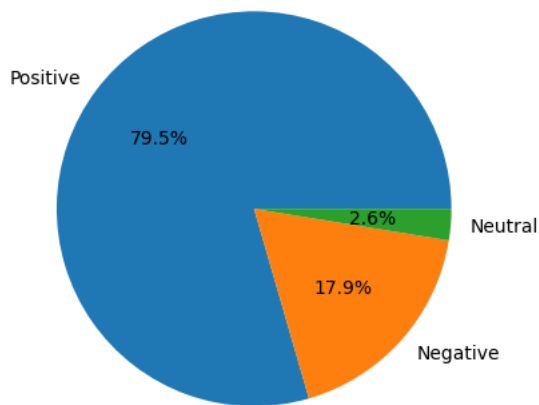

rating analysis

```python
import re
data['rating'] = data['rating'].apply(lambda x: re.sub(r'[^\d.]', '', x))


data.head()
```

	reviewer_id	store_name	category	store_address	latitude	longitude	rating_c
0	1	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	
1	2	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	
2	3	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	

```python
data['sentiment_rating'] = 'Neutral'
data.loc[data['rating'].astype(float) < 3, 'sentiment_rating'] = 'Negative'
data.loc[data['rating'].astype(float) > 3, 'sentiment_rating'] = 'Positive'

data.head()
```
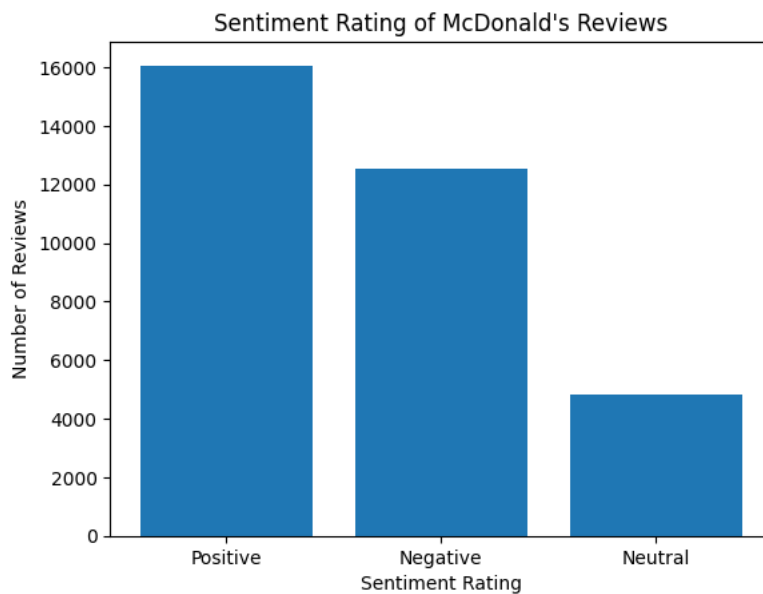
	reviewer_id	store_name	category	store_address	latitude	longitude	rating_c
0	1	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	
1	2	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	
2	3	McDonald's	Fast food restaurant	13749 US–183 Hwy, Austin, TX 78750, United States	30.460718	–97.792874	

```python
import matplotlib.pyplot as plt

# Count the number of reviews for each sentiment rating
sentiment_counts = data['sentiment_rating'].value_counts()

# Create a bar chart of the sentiment ratings
plt.bar(sentiment_counts.index, sentiment_counts.values)
plt.xlabel('Sentiment Rating')
plt.ylabel('Number of Reviews')
plt.title('Sentiment Rating of McDonald\'s Reviews')
plt.show()

# Create a pie chart of the sentiment ratings
plt.pie(sentiment_counts.values, labels=sentiment_counts.index, autopct='%1.1f%%', colors=['cyan', 'orange', 'yellow'])
plt.title('Sentiment Rating of Mcdonalds\'s Reviews')
plt.show()
```
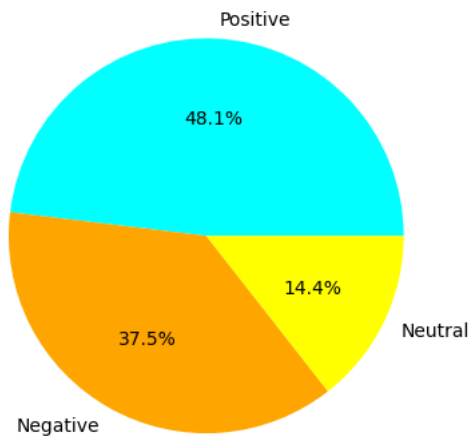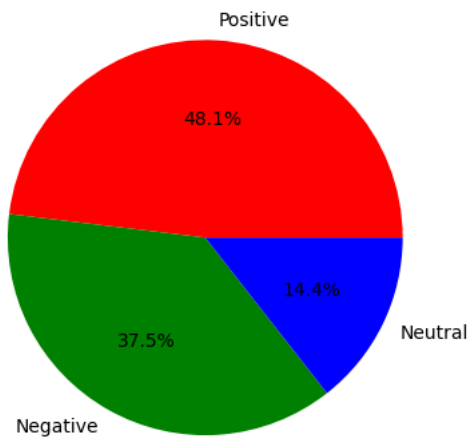




```python
import matplotlib.pyplot as plt
plt.pie(sentiment_counts.values, labels=sentiment_counts.index, autopct='%1.1f%%', colors=['red', 'green', 'blue'])
```

```
([<matplotlib.patches.Wedge at 0x7da5bb334e50>,
  <matplotlib.patches.Wedge at 0x7da5bb334eb0>,
  <matplotlib.patches.Wedge at 0x7da5bb336980>],
 [Text(0.0658760617292821, 1.0980256574830298, 'Positive'),
  Text(-0.5400230001065748, -0.9583189236135821, 'Negative'),
  Text(0.9889394133358957, -0.4816625756178846, 'Neutral')],
 [Text(0.03593239730688114, 0.5989230858998345, '48.1%'),
  Text(-0.29455800005813165, -0.5227194128801357, '37.5%'),
  Text(0.5394214981832158, -0.26272504124611884, '14.4%')])
```


Bad words count

```
negative_reviews = data[data['sentiment_rating'] == 'Negative']
```

```
Neg_review = negative_reviews['review']
```

```
!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) (1.4.0)
Requirement already satisfied: regex>=2021.8.3 in /usr/local/lib/python3.10/dist-packages (from nltk) (2023.12.25)
Requirement already satisfied: tqdm in /usr/local/lib/python3.10/dist-packages (from nltk) (4.66.2)
```

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

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

```
Neg_review = Neg_review.apply(lambda x: ' '.join([word.lower() for word in x.split() if word.isalpha()]))
Neg_review.head()
```

```
0    why does it look like someone spit on my i had...
2    made a mobile order got to the speaker and che...
4    i repeat my order times in the drive and she s...
5    i work for door dash and they locked us all ou...
6    if i could give this location a zero on custom...
Name: review, dtype: object
```

```python
#removing stop words for Neg_review
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize

stop_words = stopword = nltk.corpus.stopwords.words('english')

def remove_stop_words(text):
  tokens = word_tokenize(text)
  filtered_text = [token for token in tokens if token not in stop_words]
  return ' '.join(filtered_text)

Neg_review = Neg_review.apply(remove_stop_words)
Neg_review.head()
```

```
0    look like someone spit normal everyone chill d...
2    made mobile order got speaker checked line mov...
4     repeat order times drive still manage mess sup...
5    work door dash locked us wait long line reason...
6    could give location zero customer pulled drive...
Name: review, dtype: object
```

```python
nltk.download('wordnet')
from nltk.stem import WordNetLemmatizer

lemmatizer = WordNetLemmatizer()

def lemmatize_text(text):
  tokens = word_tokenize(text)
  lemmatized_text = [lemmatizer.lemmatize(token) for token in tokens]
  return ' '.join(lemmatized_text)

Neg_review = Neg_review.apply(lemmatize_text)
Neg_review.head()
```

```
[nltk_data] Downloading package wordnet to /root/nltk_data...
0    look like someone spit normal everyone chill d...
2    made mobile order got speaker checked line mov...
4     repeat order time drive still manage mess supp...
5    work door dash locked u wait long line reason ...
6    could give location zero customer pulled drive...
Name: review, dtype: object
```

```python
nltk.download('averaged_perceptron_tagger')

def extract_adjectives(text):
  pos_tags = nltk.pos_tag(word_tokenize(text))
  adjectives = [word for word, pos in pos_tags if pos.startswith('JJ')]
  return ' '.join(adjectives)

Neg_review2 = Neg_review.apply(extract_adjectives)
Neg_review2.head()
```

```
[nltk_data] Downloading package averaged_perceptron_tagger to
[nltk_data]     /root/nltk_data...
[nltk_data]   Unzipping taggers/averaged_perceptron_tagger.zip.
0                                    normal milky
2                             mobile leave late next
4     suppose large double large wrong need close un...
5                                       u open new
6     simple regular pull minute young front young r...
Name: review, dtype: object
```

```python
import matplotlib.pyplot as plt
from wordcloud import WordCloud

# Create a word cloud of the negative reviews
wordcloud = WordCloud(width=800, height=400, background_color='white').generate(' '.join(Neg_review2))

# Display the word cloud
plt.figure(figsize=(10, 5))
plt.imshow(wordcloud, interpolation='bilinear')
plt.axis('off')
plt.show()
```
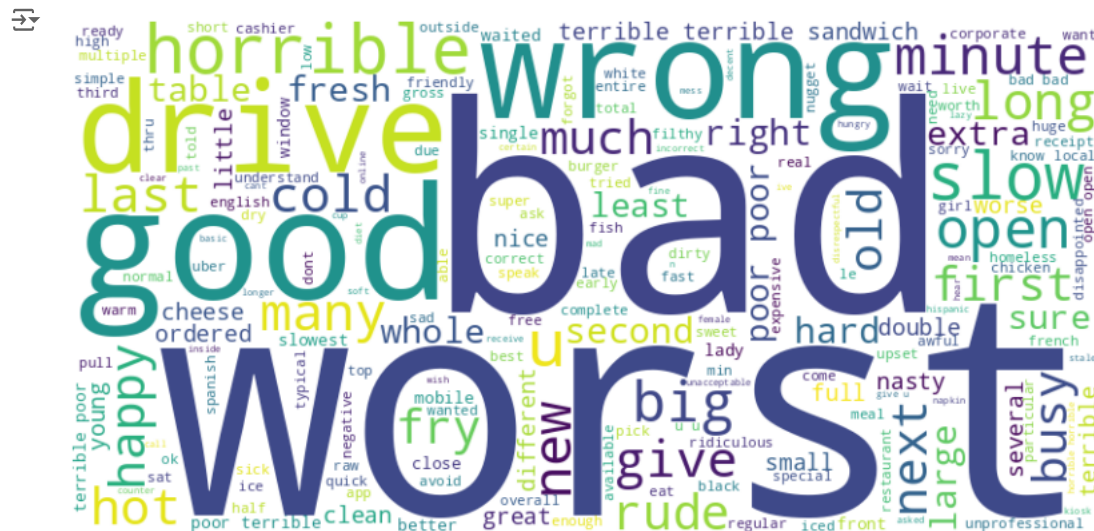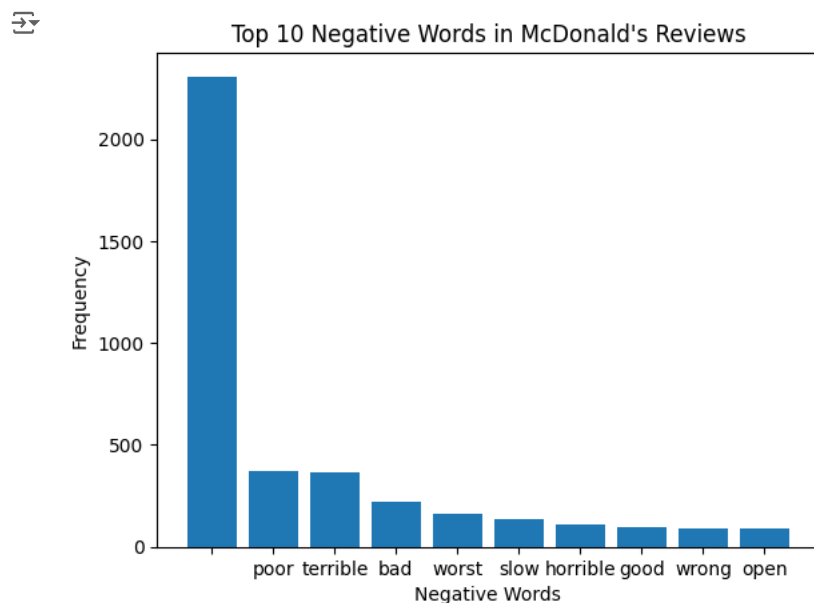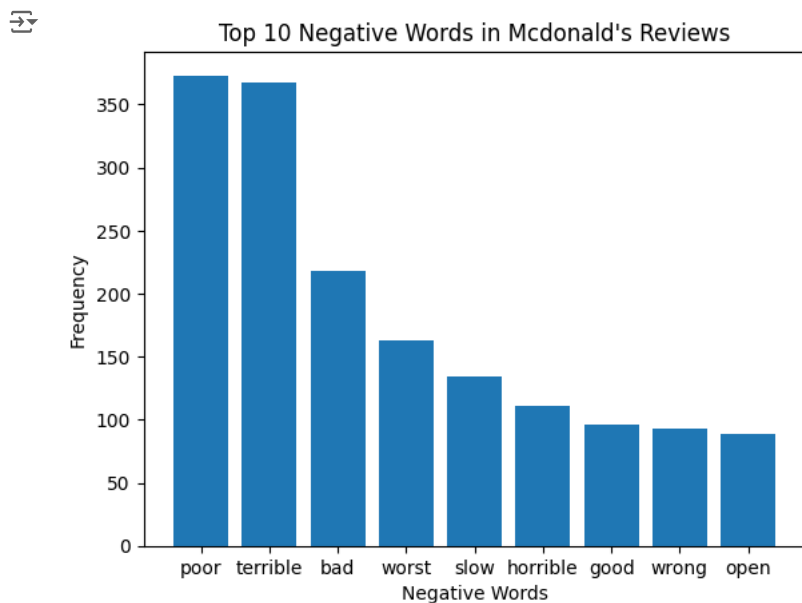


```python
import matplotlib.pyplot as plt
# Get the top 10 negative words
top_negative_words = Neg_review2.value_counts().head(10)

# Plot the top 10 negative words
plt.bar(top_negative_words.index, top_negative_words.values)
plt.xlabel('Negative Words')
plt.ylabel('Frequency')
plt.title('Top 10 Negative Words in McDonald\'s Reviews')
plt.show()
```

```python
import matplotlib.pyplot as plt
# Get the top 10 negative words, skipping the first one
top_negative_words = Neg_review2.value_counts()[1:10]

# Plot the top 10 negative words, starting with the second most frequent
plt.bar(top_negative_words.index, top_negative_words.values)
plt.xlabel('Negative Words')
plt.ylabel('Frequency')
plt.title('Top 10 Negative Words in Mcdonald\'s Reviews')
plt.show()
```


text cluster

```python
Neg_review.head()
```

```
0     look like someone spit normal everyone chill d...
2     made mobile order got speaker checked line mov...
4      repeat order time drive still manage  mess supp...
5     work door dash locked u wait long line reason ...
6     could give location zero customer pulled drive...
Name: review, dtype: object
```

```python
Neg_review = Neg_review.to_frame(name="bad_review")
Neg_review.head()
```

	bad_review
0	look like someone spit normal everyone chill d...
2	made mobile order got speaker checked line mov...
4	repeat order time drive still manage mess supp...
5	work door dash locked u wait long line reason ...
6	could give location zero customer pulled drive...

```python
Neg_review['bad_review'] = Neg_review['bad_review'].astype(str)
Neg_review.head()
```

	bad_review
0	look like someone spit normal everyone chill d...
2	made mobile order got speaker checked line mov...
4	repeat order time drive still manage mess supp...

```python
def categorize_reviews(reviews):
    food_words = ['food', 'burger', 'fries', 'chicken', 'drink', 'taste', 'flavor', 'menu', 'item']
    customer_experience_words = ['service', 'staff', 'employee', 'manager', 'attitude', 'helpfulness', 'experience']
    service_words = ['clean', 'dirty', 'wait', 'time', 'speed', 'quality', 'atmosphere', 'environment']

    categorized_reviews = []
    for review in reviews:
        category = None
        for word in food_words:
            if word in review:
                category = 'food'
                break
        if category is None:
            for word in customer_experience_words:
                if word in review:
                    category = 'customer_experience'
                    break
        if category is None:
            for word in service_words:
                if word in review:
                    category = 'service'
                    break
        if category is None:
            category = 'other'
        categorized_reviews.append(category)

    Neg_review['category'] = categorized_reviews

    return Neg_review

Neg_review = categorize_reviews(Neg_review['bad_review'])
Neg_review.head()
```

	bad_review	**category**
0	look like someone spit normal everyone chill d...	other
2	made mobile order got speaker checked line mov...	customer_experience
4	repeat order time drive still manage mess supp...	service
5	work door dash locked u wait long line reason ...	service
6	could give location zero customer pulled drive...	food