

# Sentiment Assignment

February 20, 2024

## 1 ADS 509 Sentiment Assignment

This notebook holds the Sentiment Assignment for Module 6 in ADS 509, Applied Text Mining. Work through this notebook, writing code and answering questions where required.

In a previous assignment you put together Twitter data and lyrics data on two artists. In this assignment we apply sentiment analysis to those data sets. If, for some reason, you did not complete that previous assignment, data to use for this assignment can be found in the assignment materials section of Blackboard.

```
[ ]: import os
import re
import emoji
import pandas as pd
import numpy as np

from collections import Counter, defaultdict
from string import punctuation
```

```
[ ]: # Additional import statements made here
np.int = np.int_
np.float = np.float_
# pip uninstall nltk
# pip install -U nltk
# restart notebook
import nltk
import zipfile
import shutil
import html
import matplotlib
import matplotlib.pyplot as plt
import seaborn as sns

#first, download the stopwords.zip file from https://www.nltk.org/nltk\_data/
↳ and then extract it
source_dir = '/Users/calebmccurdy/downloads/stopwords'
dest_dir = '/Users/calebmccurdy/nltk_data/corpora/stopwords'
```

```

if os.path.exists(dest_dir):
    shutil.rmtree(dest_dir)
shutil.move(source_dir, dest_dir)

#first, download the punkt.zip file from https://www.nltk.org/nltk_data/ and
↳ then extract it
punkt_source_dir = '/Users/calebmccurdy/downloads/punkt'
punkt_dest_dir = '/Users/calebmccurdy/nltk_data/corpora/punkt'

if os.path.exists(punkt_dest_dir):
    shutil.rmtree(punkt_dest_dir)
shutil.move(punkt_source_dir, punkt_dest_dir)

```

```
[ ]: '/Users/calebmccurdy/nltk_data/corpora/punkt'
```

```

[ ]: # Final remaining pre-loaded imports
from nltk.corpus import stopwords
sw = stopwords.words("english")
from nltk.probability import FreqDist
from sklearn.feature_extraction.text import TfidfTransformer, CountVectorizer

```

```

[ ]: # change `data_location` to the location of the folder on your machine.
data_location = "/Users/calebmccurdy/Desktop/USD/ADS 509/Lyrics Assignment/"

twitter_folder = "twitter/"
lyrics_folder = "lyrics/"

positive_words_file = "positive-words.txt"
negative_words_file = "negative-words.txt"
tidy_text_file = "tidytext_sentiments.txt"

```

## 1.1 Data Input

Now read in each of the corpora. For the lyrics data, it may be convenient to store the entire contents of the file to make it easier to inspect the titles individually, as you'll do in the last part of the assignment. In the solution, I stored the lyrics data in a dictionary with two dimensions of keys: artist and song. The value was the file contents. A Pandas data frame would work equally well.

For the Twitter data, we only need the description field for this assignment. Feel free all the descriptions read it into a data structure. In the solution, I stored the descriptions as a dictionary of lists, with the key being the artist.

```

[ ]: # Read in the lyrics data

# Define path to the lyrics folder
lyrics_folder_path = os.path.join(data_location, lyrics_folder)

```

```

# Dictionary to store lyrics and title data
lyrics_data = {}
title_data = {}

# Loop through each artist subfolder in the lyrics folder
for artist_folder in os.listdir(lyrics_folder_path):
    artist_path = os.path.join(lyrics_folder_path, artist_folder)

    # Check if it's a directory
    if os.path.isdir(artist_path):
        artist = artist_folder
        lyrics_data.setdefault(artist, {})
        title_data.setdefault(artist, {})
        # Loop through each txt file in the artist subfolder
        for file_name in os.listdir(artist_path):

            # Extract song name from the file name
            song = os.path.splitext(file_name)[0]
            file_path = os.path.join(artist_path, file_name)

            # Read the entire text data from the file
            # https://www.dataquest.io/blog/read-file-python/
            with open(file_path, 'r') as file:
                skip = file.readline()
                text_data = file.read()
                lyrics_data[artist][song] = text_data

            with open(file_path, 'r') as f:
                text_data_line = f.readline()
                title_data[artist][song] = text_data_line

# Now, we have the lyrics data in the 'lyrics_data' dictionary with artist and
↳ song names as keys.
# We also have the title data in the 'title_data' dictionary with artist and
↳ song names as keys.

```

```

[ ]: # Read in the twitter data

# Define the path to the twitter folder
twitter_folder_path = os.path.join(data_location, twitter_folder)

# Dictionary to store Twitter descriptions
twitter_data = {}

# Loop through each txt file in the twitter folder
for file_name in os.listdir(twitter_folder_path):
    if file_name.endswith("_data.txt"):

```

```

artist = file_name.split("_")[0]
file_path = os.path.join(twitter_folder_path, file_name)
df = pd.read_csv(file_path, sep='\t', quoting=3)

# Extract the 'description' column from the DataFrame
descriptions = df['description'].tolist()
twitter_data[artist] = descriptions

# Now, we have the twitter followers description data in the 'twitter_data'
↳ dictionary with artist as the key.

```

```

[ ]: positive_words_path = os.path.join(data_location, positive_words_file)
negative_words_path = os.path.join(data_location, negative_words_file)

# Read the positive/negative words from the file and ignore lines starting with
↳ ';'
positive_words = []
negative_words = []
with open(positive_words_path, 'r') as file:
    for line in file:
        line = line.strip()
        if line and not line.startswith(';'):
            positive_words.append(line)
with open(negative_words_path, 'r') as file:
    for line in file:
        line = line.strip()
        if line and not line.startswith(';'):
            negative_words.append(line)

positive_words_df = pd.DataFrame({'Word': positive_words, 'Score': 1})
negative_words_df = pd.DataFrame({'Word': negative_words, 'Score': -1})

print(positive_words_df)
print(negative_words_df)

```

	Word	Score
0	a+	1
1	abound	1
2	abounds	1
3	abundance	1
4	abundant	1
...	...	...
2001	youthful	1
2002	zeal	1
2003	zenith	1
2004	zest	1
2005	zippy	1

[2006 rows x 2 columns]

	Word	Score
0	2-faced	-1
1	2-faces	-1
2	abnormal	-1
3	abolish	-1
4	abominable	-1
...	...	...
4778	zaps	-1
4779	zealot	-1
4780	zealous	-1
4781	zealously	-1
4782	zombie	-1

[4783 rows x 2 columns]

```
[ ]: positive_negative_df = pd.concat([positive_words_df, negative_words_df],  
    ↪ ignore_index=True)  
  
print("Combined Positive+Negative DataFrame:")  
print(positive_negative_df)
```

Combined Positive+Negative DataFrame:

	Word	Score
0	a+	1
1	abound	1
2	abounds	1
3	abundance	1
4	abundant	1
...	...	...
6784	zaps	-1
6785	zealot	-1
6786	zealous	-1
6787	zealously	-1
6788	zombie	-1

[6789 rows x 2 columns]

```
[ ]: tidy_text_path = os.path.join(data_location, tidy_text_file)  
  
# Read tidy text sentiment words into a dataframe  
tidy_text_df = pd.read_csv(tidy_text_path, sep='\t')  
tidy_text_df['Score'] = tidy_text_df['sentiment'].apply(lambda x: 1 if x ==  
    ↪ 'positive' else -1)  
  
tidy_scores_df = tidy_text_df[['word', 'Score']]
```

```

tidy_scores_df = tidy_scores_df.rename(columns={'word': 'Word'})

print("Tidytext Words Dataframe:")
print(tidy_scores_df.head(20))

```

Tidytext Words Dataframe:

	Word	Score
0	abandon	-1
1	abandoned	-1
2	abandonment	-1
3	abba	1
4	abduction	-1
5	aberrant	-1
6	aberration	-1
7	abhor	-1
8	abhorrent	-1
9	ability	1
10	abject	-1
11	abnormal	-1
12	abolish	-1
13	abolition	-1
14	abominable	-1
15	abomination	-1
16	abort	-1
17	abortion	-1
18	abortive	-1
19	abovementioned	1

```

[ ]: word_sentiment_df = pd.concat([positive_negative_df, tidy_scores_df],
    ↪ ignore_index=True)

print("Combined Sentiment DataFrame:")
print(word_sentiment_df)

```

Combined Sentiment DataFrame:

	Word	Score
0	a+	1
1	abound	1
2	abounds	1
3	abundance	1
4	abundant	1
...	...	...
21917	win	1
21918	winner	1
21919	winners	1
21920	winning	1
21921	worthy	1

[21922 rows x 2 columns]

```
[ ]: sentiments_df = word_sentiment_df.groupby('Word')['Score'].mean().reset_index()
sentiments_df['Score'] = sentiments_df['Score'].apply(lambda x: 1 if x > 0 else
↳ (-1 if x < 0 else 0))

print("Majority Sentiments DataFrame:")
print(sentiments_df)
```

Majority Sentiments DataFrame:

	Word	Score
0	2-faced	-1
1	2-faces	-1
2	a+	1
3	abandon	-1
4	abandoned	-1
...	...	...
11403	zenith	1
11404	zest	1
11405	zip	-1
11406	zippy	1
11407	zombie	-1

[11408 rows x 2 columns]

## 1.2 Sentiment Analysis on Songs

In this section, score the sentiment for all the songs for both artists in your data set. Score the sentiment by manually calculating the sentiment using the combined lexicons provided in this repository.

After you have calculated these sentiments, answer the questions at the end of this section.

```
[ ]: punctuation = set(punctuation) # speeds up comparison

whitespace_pattern = re.compile(r"\s+")

def tokenize(text) :
    tokens = re.split(whitespace_pattern, text)
    return(tokens)
```

```
[ ]: def clean_lyrics(text):
    if isinstance(text, str):
        # remove punctuation characters
        text = ''.join([char for char in text if char not in punctuation])
        # fold to lowercase
        text = text.lower()
```

```

        # remove stopwords
        text = ' '.join([word for word in text.split() if word.lower() not in sw])

        # remove extra white spaces
        text = re.sub(r'\s+', ' ', text)
        return text
    else:
        return ''

```

```

[ ]: def sent_score(text):
    sentiment_score = 0
    cleaned_text = clean_lyrics(text)
    bag_of_words = tokenize(cleaned_text)
    #bag_of_words = clean_lyrics(text)

    for word in bag_of_words:
        if word in sentiments_df['Word'].values:
            sentiment_score += sentiments_df.loc[sentiments_df['Word'] == word,
            'Score'].values[0]

    if len(bag_of_words) > 0:
        return sentiment_score / len(bag_of_words)
    else:
        return 0.0

```

```

[ ]: lyrics_data_list = []
for artist, songs in lyrics_data.items():
    for song, lyrics in songs.items():
        song_title = title_data.get(artist, {}).get(song, "")
        song_title = song_title.strip("\n")
        lyrics_data_list.append({'Artist': artist, 'Song': song, 'Lyrics':
        lyrics, 'Song_Title': song_title})

# Create a DataFrame from the list of dictionaries
lyrics_df = pd.DataFrame(lyrics_data_list)
print("Lyrics DataFrame:")
print(lyrics_df.head())

```

Lyrics DataFrame:

	Artist	Song \
0	robyn	robyn_includemeout
1	robyn	robyn_electric
2	robyn	robyn_beach2k20
3	robyn	robyn_lovekills
4	robyn	robyn_timemachine

Lyrics      Song\_Title



```

0  \n\n\nIt is really very simple\nJust a single ... Include Me Out
1  \n\n\nElectric...\n\nIt's electric\nIt's a nat... Electric
2  \n\n\n(So you wanna go out?\nHow you gonna get... Beach 2K20
3  \n\n\nIf you're looking for love\nGet a heart ... Love Kills
4  \n\n\nHey, what did I do?\nCan't believe the f... Time Machine

```

```

[ ]: lyrics_df['Sentiment Score'] = lyrics_df['Lyrics'].apply(sent_score)
selected_columns = ['Artist', 'Song_Title', 'Lyrics', 'Sentiment Score']
song_sentiment_df = lyrics_df[selected_columns]

```

```

[ ]: song_sentiment_df.head(20)

```

```

[ ]:
Artist      Song_Title \
0  robyn      Include Me Out
1  robyn      Electric
2  robyn      Beach 2K20
3  robyn      Love Kills
4  robyn      Time Machine
5  robyn      Love Kills
6  robyn      Giving You Back
7  robyn      None Of Dem
8  robyn      None Of Dem
9  robyn      Be Mine!
10 robyn      Fembot
11 robyn      Should Have Known
12 robyn      Underneath The Heart
13 robyn      Eclipse
14 robyn      Robyn Is Here
15 robyn      Don't Stop The Music
16 robyn      Criminal Intent
17 robyn      My Only Reason
18 robyn      Human Being
19 robyn      O Baby

```

```

Lyrics      Sentiment Score
0  \n\n\nIt is really very simple\nJust a single ...      0.047210
1  \n\n\nElectric...\n\nIt's electric\nIt's a nat...      0.151316
2  \n\n\n(So you wanna go out?\nHow you gonna get...      0.151163
3  \n\n\nIf you're looking for love\nGet a heart ...      -0.098361
4  \n\n\nHey, what did I do?\nCan't believe the f...      -0.062992
5  \n\n\nIf you're looking for love\nGet a heart ...      -0.097959
6  \n\n\nIn another time\nAnother life\nIn anothe...      0.154545
7  \n\n\nNone of these boys can dance\nNot a sing...      0.088710
8  \n\n\nNone of these boys can dance\nNot a sing...      0.088710
9  \n\n\nIt's a good thing tears never show in th...      0.028736
10 \n\n\nI've got some news for you\nFembots have...      0.044898
11 \n\n\nI should have seen it coming, I should h...      0.020833

```

12	\n\n\nI look into your eyes and see a place\nD...	0.103774
13	\n\n\nThere's an eclipse in your eye\nWhere I ...	-0.019608
14	\n\n\nRobyn is here\nRobyn is here\nRobyn is h...	0.110294
15	\n\n\nThis little girl didn't care what anybod...	0.175676
16	\n\n\nSomebody alert the authorities, I got cr...	-0.181495
17	\n\n\nMy only reason...\n\n[CHORUS]\nLove is m...	0.080808
18	\n\n\nI'm a human being\nAnd so are you\nMy he...	0.017857
19	\n\n\n[Chorus:]\nO baby you're making that mis...	-0.011236

```
[ ]: # Group by artist and calculate the mean sentiment score per song
sentiment_per_artist_df = lyrics_df.groupby('Artist')['Sentiment Score'].mean().
    round(3)
sentiment_per_artist_df
```

```
[ ]: Artist
CityAlight    0.208
PatBarrett    0.187
cher          0.053
robyn         0.064
Name: Sentiment Score, dtype: float64
```

```
[ ]: # Filter data for the artist 'CityAlight'
cityalight_df = lyrics_df[lyrics_df['Artist'] == 'CityAlight']

cityalight_highest_sentiments = cityalight_df.sort_values(by='Sentiment Score',
    ascending=False).head(3)
cityalight_lowest_sentiments = cityalight_df.sort_values(by='Sentiment Score',
    ascending=True).head(3)

# Display the song title, sentiment score, and lyrics of the songs with the
    highest sentiments
print("Top 3 Songs with Highest Sentiments for CityAlight:")
for idx, row in cityalight_highest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")

# Display the song title, sentiment score, and lyrics of the songs with the
    lowest sentiments
print("\nTop 3 Songs with Lowest Sentiments for CityAlight:")
for idx, row in cityalight_lowest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")
```

Top 3 Songs with Highest Sentiments for CityAlight:

Song Title: Good And Gracious King

Sentiment Score: 0.583

Lyrics:

I approach the throne of glory

Nothing in my hands I bring

But the promise of acceptance

From a good and gracious King

I will give to You my burden

As You give to me Your strength

Come and fill me with Your Spirit

As I sing to You this praise

You deserve the greater glory, and overcome, I lift my voice

To the King in need of nothing, empty handed I rejoice

You deserve the greater glory, and overcome with joy I sing

By Your love, I am accepted, 'cause You're a good and gracious King

And O what grace that You would see me

As Your child and as Your friend

Safe, secure in You forever

I pour out my praise again

'Cause You deserve the greater glory, and overcome, I lift my voice  
To the King in need of nothing, empty handed I rejoice  
'Cause You deserve the greater glory, and overcome with joy I sing  
By Your love, I am accepted, 'cause You're a good and gracious King

Holy, holy, Lord Almighty  
Good and gracious, good and gracious  
Holy, holy, Lord Almighty  
Good and gracious King  
Holy, holy, Lord Almighty  
Good and gracious, good and gracious  
Holy, holy, Lord Almighty  
Good and gracious King

You deserve the greater glory, and overcome, I lift my voice  
To the King in need of nothing, empty handed I rejoice  
You deserve the greater glory, and overcome with joy I sing  
By Your love, I am accepted, You're a good and gracious King

You're a good and gracious King  
You're a good and gracious King

Song Title: God Is Over All  
Sentiment Score: 0.518  
Lyrics:

God You hold the world in hand  
Mountains move at Your command  
Yet my needs You will provide  
As a father loves his child

God is over all  
God is over all  
I will sing for it is well  
My God is over all

God You saw the sin in me  
For you reign in majesty  
Jesus died to make me clean  
Jesus rose to set me free

God is over all  
God is over all  
I will sing for it is well  
My God is over all

God above all time and space  
You are never far away

For in Jesus I can see  
How you are a friend to me

God is over all  
God is over all  
I will sing for it is well  
My God is over all

God is over all  
God is over all  
I will sing for it is well  
My God is over all  
My God is over all

Song Title: The Love Of The Father  
Sentiment Score: 0.447  
Lyrics:

Lift up your voices and lift up your praise  
Join with the heavens declaring the wonders  
Of His faithfulness forever

Sing of the victory, the hope of the world  
The Saviour has risen, the Spirit has come to  
Bring us into love forever

We are the people of God

With the freedom of hope in our hearts

How great is the love of the Father

Lifted from darkness and into the light

The sons and the daughters are loved at a price

Our God has made us His forever

We are the people of God

With the freedom of hope in our hearts

How great is the love of the Father

We are the people of God

With the freedom of hope in our hearts

How great is the love of the Father

This is the song of the redeemed

The ransomed and the free

Given life at such a price

This is love, this is love

And when the Father calls us home

And we see Him on the throne

Hear the voices sing as one

This is love, this is love

We are the people of God  
With the freedom of hope in our hearts  
How great is the love of the Father  
We are the people of God  
With the freedom of hope in our hearts  
How great is the love of the Father

Top 3 Songs with Lowest Sentiments for CityAlight:

Song Title: Washed By The Blood  
Sentiment Score: -0.099  
Lyrics:

Once a slave to the fear and the darkness held within  
O the weight of my sin, my shame  
By His grace purified, in redeeming sacrifice  
Living hope that won't spoil or fade

I am washed by the blood of the Son on the cross  
I am washed by the blood of the Lamb  
All my guilt, all my shame, were His wounds and His pain  
I am washed by the blood of the Lamb

Now we know who we are, precious children called by God



Let us serve and exalt our King

With our hearts and our minds freely offer up our lives

Run the race, fix our gaze on Him

We are washed by the blood of the Son on the cross

We are washed by the blood of the Lamb

All our guilt, all our shame, were His wounds and His pain

We are washed by the blood of the Lamb

We will rise as He rose, for the grave no longer holds

Every tear will be wiped away

And the saints will be heard, praising God forevermore

Face to face with the One who saves

We are washed by the blood of the Son on the cross

We are washed by the blood of the Lamb

All our guilt, all our shame, were His wounds and His pain

We are washed by the blood of the Lamb, oh

We are washed by the blood of the Son on the cross

We are washed by the blood of the Lamb

All our guilt, all our shame, were His wounds and His pain

We are washed by the blood of the Lamb

Song Title: In Christ Alone (Live From Sydney)

Sentiment Score: -0.057

Lyrics:

In Christ alone my hope is found  
He is my light, my strength, my song  
This cornerstone, this solid ground  
Firm through the fiercest drought and storm

What heights of love, what depths of peace  
When fears are stilled, when strivings cease  
My Comforter, my All in All  
Here in the love of Christ I stand

In Christ alone, who took on flesh  
Fullness of God in helpless babe  
This gift of love and righteousness  
Scorned by the ones He came to save

Till on that cross as Jesus died  
The wrath of God was satisfied  
For every sin on Him was laid  
Here in the death of Christ I live

There in the ground His body lay  
Light of the world by darkness slain

Then bursting forth in glorious Day

Up from the grave he rose again

And as He stands in victory

Sin's curse has lost its grip on me

For I am His and He is mine

Bought with the precious blood of Christ

No guilt in life, no fear in death

This is the power of Christ in me

From life's first cry to final breath

Jesus commands my destiny

No power of hell, no scheme of man

Can ever pluck me from His hand

Till He returns or calls me home

Here in the power of Christ I'll stand

No power of hell, no scheme of man

Can ever pluck me from His hand

Till He returns or calls me home

Here in the power of Christ I'll stand

Song Title: Jesus Is Alive

Sentiment Score: -0.018

Lyrics:

There is now a hope that lasts beyond our days

For the One that once was buried lives again

Now the tomb is bare and empty and the stone is rolled away

Praise the Risen One who overcame the grave

All you broken-hearted, all you worn and weak

Come find living water, everlasting streams

To the wandering spirit, lost and searching wanting something more

Find the Risen King who overcomes the world

Let there be dancing in the darkness

And let our song break through the night

Lift your voice and sing that Christ is King

For Jesus is alive

No more condemnation, no more doubt and fear

For our sin and shame, they have no power here

In His resurrection, perfect love has set the captives free

Praise the Risen King who stands in victory

Let there be dancing in the darkness

And let our song break through the night  
Lift your voice and sing that Christ is King  
For Jesus is alive  
Let there be dancing in the darkness  
And let our song break through the night  
Lift your voice and sing that Christ is King  
For Jesus is alive

Hallelujah, death is undone  
Hallelujah, Jesus has won  
Hallelujah, we overcome  
Oh in Jesus, oh in Jesus  
Hallelujah, death is undone  
Hallelujah, Jesus has won  
Hallelujah, we overcome  
Oh in Jesus, oh in Jesus  
Hallelujah, death is undone  
Hallelujah, Jesus has won  
Hallelujah, we overcome  
Oh in Jesus, oh in Jesus!

Let there be dancing in the darkness  
And let our song break through the night  
Lift your voice and sing that Christ is King

For Jesus is alive

Let there be dancing in the darkness

And let our song break through the night

Lift your voice and sing that Christ is King

For Jesus is alive

Lift your voice and sing that Christ is King

For Jesus is alive

```
[ ]: # Filter data for the artist 'Pat Barrett'
patbarrett_df = lyrics_df[lyrics_df['Artist'] == 'PatBarrett']

patbarrett_highest_sentiments = patbarrett_df.sort_values(by='Sentiment Score',
    ↪ascending=False).head(3)
patbarrett_lowest_sentiments = patbarrett_df.sort_values(by='Sentiment Score',
    ↪ascending=True).head(3)

# Display the song title, sentiment score, and lyrics of the songs with the
    ↪highest sentiments
print("Top 3 Songs with Highest Sentiments for Pat Barrett:")
for idx, row in patbarrett_highest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")

# Display the song title, sentiment score, and lyrics of the songs with the
    ↪lowest sentiments
print("\nTop 3 Songs with Lowest Sentiments for Pat Barrett:")
for idx, row in patbarrett_lowest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")
```

Top 3 Songs with Highest Sentiments for Pat Barrett:

Song Title: God Is So Good (You Are Worthy)

Sentiment Score: 0.609

Lyrics:

No height or depth can separate  
Your steadfast love who can escape  
Your faithfulness, an endless sea  
So full of grace and mercy  
We sing

God is so good  
God is so good  
God is so good  
He's so good to me

Haunted by the past no more  
My innocence has been restored  
Forgiveness flows from Your veins  
Your kindness shown in all Your ways  
We sing

God is so good  
God is so good  
God is so good  
He's so good to me

There's never been anyone like You

There's never been anyone like...

You are worthy, You are worthy

Never been anyone like You

Never been anyone like You

You are worthy, You are worthy

And hope is rising like the sun

The old is gone, the new has come

I fix my eyes on Christ alone

My Rock, my Shield, my Cornerstone

We sing

God is so good

God is so good

God is so good

He's so good to me (oh, You are)

God, You are good

God, You are good

God, You're so good

You're so good to me

Set my eyes on You alone



My Rock, my Shield, my Cornerstone

Oh...

Good, always good, always good

God, You are good, You are always good

God, You're so good, always good

God, You're so good, always good

God, You're so good, always good

God, You're so good, always good

God, You're so good, always good

We sing

God is so good

God is so good

God is so good

He's so good to me

God is so good

He's so good to me

God, You're so good

You're so good to me

Song Title: Sing Soul Sing  
Sentiment Score: 0.496  
Lyrics:

Love, love, wondrous love

Forgave a sinner like me

Love, love, wondrous love

Oh, how can it be?

How can it be?

Thank you, Jesus

Grace, grace, saving grace

All sufficient for me

Grace, grace, saving grace

Oh, how can it be?

Sing, soul, sing

Let His praises out

Sing, soul, sing

Let His praises out

Through every high and every low

Here and now, forevermore

Sing, soul, sing

Sing His praises now

Peace, peace, perfect peace

Calmed the storm in me

Peace, peace, perfect peace

Oh, how can it be?

Hope, hope, eternal hope

Walking here with me

Hope, hope, eternal hope

Oh, how can it be?

Sing, soul, sing

Let His praises out

Sing, soul, sing

Let His praises out

Through every high and every low

Here and now, forevermore

Sing, soul, sing

Sing His praises now

Sing, soul, sing

Let His praises out

Sing, soul, sing

Let His praises out

Through every high and every low

Here and now, forevermore

Sing, soul, sing

Sing His praises now

Love, love, wondrous love

Forgave a sinner like me

Love, love, wondrous love

Oh, how can it be?

Song Title: When I Look At The Blood

Sentiment Score: 0.477

Lyrics:

When I look at the blood

All I see is love, love, love

When I stop at the cross

I can see the love of God

But I can't see competition

I can't see hierarchy

I can't see pride or prejudice

Or the abuse of authority

I can't see lust for power

I can't see manipulation

I can't see rage or anger

Or selfish ambition

When I look at the blood

All I see is love, love, love

When I stop at the cross

I can see the love of God

But I can't see unforgiveness

I can't see hate or envy

I can't see stupid fighting

Or bitterness or jealousy

I can't see empire building

I can't see self-importance

I can't see backstabbing

Or vanity, or arrogance

When I look at the blood

All I see is love, love, love

When I stop at the cross

I can see the love of God

And I see surrender

I see sacrifice

I see salvation

I see humility

I see righteousness

I see faithfulness

I see grace

I see forgiveness

I see love

I see love

I see selfless love

Love, love, love

Love, love, love

Love, love, love

Love, love

I see love, love, love

Love, love, love

Love, love, love

Love, love, love

I see love, love, love

Love, love, love

Love, love, love

Love, love

I see love, love, love (Everywhere around me)

Love, love, love (There when I wake up in the morning)

Love, love, love (Always by my side)

Love, love, love

Love, love, love (When I lie down)

Love, love, love (When I stand up)

Love, love, love (Oh, I can see)

Love, love, love

Love, love, love

Love, love, love

Love, love, love (All I can see is)

Love, love, love

Love, love, love (Oh, I see)

Love, love, love

Love, love, love (I see)

Love, love, love

Love, love, love

Love, love, love (All around me)

Love, love, love (I see)

Love, love, love

Love, love, love

Love, love, love

Love, love, love

When I look at the blood

All I see is love, love, love

When I stop at the cross

I can see the love of God

I see love

I see love

Top 3 Songs with Lowest Sentiments for Pat Barrett:

Song Title: Scatter

Sentiment Score: -0.078

Lyrics:

I don't need to be afraid of the darkness

I belong to the light

Every shadows got to run from the fire

You own the night

I don't need to be afraid of the battle

When I'm by your side

I've seen the end of this story

You win the fight

Light the fire in my soul

Tell the darkness where to go

I don't need to be afraid of the battle

When I'm by Your side

Cause I've seen the end of this story



You win the fight

Light the fire

In my soul

Tell the darkness

Where to go

Light the fire

In my soul

Tell the darkness

Where to go

Where to go

When we praise

When we praise

The enemy scatters

In your name

In your name

Strongholds shatter

When we praise

When we praise

The enemy scatters

In your name

In your name

Strongholds shatter

Tell the spirit of fear

He's gotta go

He's gotta go

Light the fire

In my soul

Tell the darkness

Where to go

Where to go

Light the fire

In my soul

Tell the darkness

Where to go

Where to go

When we praise

When we praise

The enemy scatters

In your name

In your name

Strongholds shatter

When we praise

When we praise

The enemy scatters

In your name

In your name

Strongholds shatter

Tell the spirit of fear

He's gotta go

Tell the spirit of fear

He's gotta go

He's gotta go

Tell the spirit of fear

He's gotta go

Tell the spirit of fear

He's gotta go

He's gotta go

Song Title: No Body

Sentiment Score: -0.026

Lyrics:

Behold the Lamb

Upon the cross

Who takes away

The sins of all

Forgiveness flows

From hands and feet

As violence meets

The Prince of Peace

Behold the King

Light of the world

Lamb that was slain

Lion who rose

Is mighty to save

The fullness of God

Won't be kept in a grave

Oh, darkness, your hour is over

Behold the love

His dying plea

Behold the grace of Calvary

That rugged cross

Soon to be

The emblem of a risen king

Oh, behold the King

Light of the world

Lamb that was slain

Lion who rose

Is mighty to save

The fullness of God

Won't be kept in a grave

Oh, darkness, your hour is over

Light of the world

Lamb that was slain

Lion who rose

Is mighty to save

And the fullness of God

Won't be kept in a grave

Oh, darkness, your hour is over

No enemy can hold You down

'Cause there's no body in the grave now

One head gets to wear that crown

'Cause there's no body in the grave now

No enemy can hold You down

'Cause there's no body in the grave now

One head gets to wear that crown

'Cause there's no body in the grave now

No enemy can hold You down

'Cause there's no body in the grave now

One head gets to wear that crown

'Cause there's no body in the grave now

Light of the world

Lamb that was slain

Lion who rose

Mighty to save

And the fullness of God

Won't be kept in a grave

Oh, darkness, your hour is over

Light of the world

Lamb that was slain

Lion who rose

Is mighty to save

And the fullness of God

Won't be kept in a grave

Oh, darkness, your hour is over

No enemy can hold You down

'Cause there's no body in the grave now

One head gets to wear that crown

'Cause there's no body in the grave now

No enemy can hold You down

'Cause there's no body in the grave now

One head gets to wear that crown

'Cause there's no body in the grave now

No

There's no body in the grave now

There's no body in the grave now

Song Title: Cada Mañana

Sentiment Score: -0.019

Lyrics:

Dña a dña, a Ti me rindo

Tu gracia es todo lo que necesito

Tu misericordia asombra mi vida

Por siempre yo cantaré

Oh, por siempre yo cantaré

ConfiarÃ©, guÃame

ConfiarÃ© aun sin ver

Cada maÃ±ana

Grande es tu fidelidad

Con cada aliento me llenas de vida

Un paso a la vez cuando no puedo mÃ¡s

Fuerza me das y esperanza al maÃ±ana

Por siempre yo cantarÃ©

Oh, por siempre yo cantarÃ©

ConfiarÃ©, guÃame

ConfiarÃ© aun sin ver

Cada maÃ±ana

Grande es tu fidelidad

ConfiarÃ© con todo en mÃ

Tu bondad no cambiarÃ;

Cada maÃ±ana

Grande es tu fidelidad

Temor, hoy recuerda

Seguro estoy en Dios

Oh, mi padre ha hablado



Su palabra cumplirÃ;

Temor, hoy recuerda  
Que seguro estoy en Dios  
Oh, mi padre ha hablado  
Su palabra cumplirÃ;

ConfiarÃ©

GuÃame

ConfiarÃ©

ConfÃo en Ti

Cada maÃ±ana

Oh, cada maÃ±ana

ConfiarÃ©, guÃame

ConfiarÃ© aun sin ver

Cada maÃ±ana

Grande es tu fidelidad

ConfiarÃ© con todo en mÃ

Tu bondad no cambiarÃ;

Cada maÃ±ana

Grande es tu fidelidad

```
[ ]: # Filter data for the artist 'Cher'
cher_df = lyrics_df[lyrics_df['Artist'] == 'cher']

cher_highest_sentiments = cher_df.sort_values(by='Sentiment Score',
↪ascending=False).head(3)
cher_lowest_sentiments = cher_df.sort_values(by='Sentiment Score',
↪ascending=True).head(3)

# Display the song title, sentiment score, and lyrics of the songs with the
↪highest sentiments
print("Top 3 Songs with Highest Sentiments for Cher:")
for idx, row in cher_highest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")

# Display the song title, sentiment score, and lyrics of the songs with the
↪lowest sentiments
print("\nTop 3 Songs with Lowest Sentiments for Cher:")
for idx, row in cher_lowest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")
```

Top 3 Songs with Highest Sentiments for Cher:

Song Title: My Love  
Sentiment Score: 0.524  
Lyrics:

When I go away  
I know my heart can stay with my love  
It's understood  
Everywhere with my love  
My love does it good, whoa  
My love, oh only my love  
My love does it good

And when the cupboard's bare  
I'll still find something there with my love  
It's understood  
Everywhere with my love  
My love does it so good, whoa

My love, oh only my love  
My love does it good

Only my love, oh only my love  
Only my love, hold the other things to me  
Oh, only my love, oh only my love  
Only my love does it good to me

Everywhere with my love  
Don't you see my love  
It does it so good  
Oh, only my love, only my love  
My love does it good

Don't ever ask me why  
I never say "good-bye" to my love  
It's understood  
'Cause everywhere with my love  
My love does it good, whoa  
Only my love, oh only my love  
My love does it good

Oh only my love  
Only my love does it good to me,whoa

Song Title: Sunny  
Sentiment Score: 0.456  
Lyrics:

Sunny, yesterday my life was filled with rain  
Sunny, you smiled at me and then it eased my pain  
Now the dark days are gone and bright days are here  
My Sunny once shined so sincere, Sunny once so true  
I love you I love you

Sunny thank you for the sunshine you gave to me  
Sunny thank you for the love you brought my way  
You gave to me your all and all  
And now I feel that I'm 10 feet tall  
Sunny once so true, I love you

Sunny thank you for the truth that you let me see  
Sunny thank you for the facts from A to Z  
Somehow I was torn like a wind blown sail

Then our love was borned when you held my hand  
Sunny once so true, I love you

Sunny thank you for the sunshine you gave to me  
Sunny thank you for the love you brought my way  
You gave to me your all and all  
And now I feel that I'm 10 feet tall  
Sunny once so true, I love you

Song Title: Move Me  
Sentiment Score: 0.382  
Lyrics:

Move me  
Love the way you move me, baby  
Groove me  
Love the way you groove me

Making love with you  
Little things that you do  
Make me feel so good inside

Oh oh do me  
C'mon, c'mon, do me  
Baby  
Soothe me  
Love the way you soothe me  
I love I love I love I love I love I love  
Love the way you do

Move me  
Love the way you move me, baby  
Groove me  
Love the way you groove me

Making love with you  
Little things that you do  
Make me feel so good inside

I love, I love, I love the way you move me  
Keep on, keep on doin' it  
I love, I love, I love the way you move me  
Keep on, keep on doin' it  
I love, I love, I love the way you move me

Keep on, keep on, doin' it  
[Fade out]

Top 3 Songs with Lowest Sentiments for Cher:

Song Title: Bang-Bang  
Sentiment Score: -0.41  
Lyrics:

Bang bang you shot me down  
Bang bang I hit the ground  
Bang bang that awful sound  
Bang bang my baby shot me down

I was five and you were six  
We rode on horses made of sticks  
I wore black you wore white  
You would always win the fight

Bang bang you shot me down  
Bang bang I hit the ground  
Bang bang that awful sound  
Bang bang my baby shot me down

Seasons came and changed the time  
I grew up I called you mine  
You would always laugh and say  
Remember when we used to play

Bang bang you shot me down  
Bang bang and I hit the ground  
Bang bang that awful sound  
Bang bang my baby shot me down

Music played and people sang  
Just for me the church bells rang  
After echoes from a gun  
We both vowed that we'd be one

Now you're gone I don't know why  
Sometimes I cry  
You didn't say goodbye  
You didn't take the time to lie

Bang bang you shot me down  
Bang bang I hit the ground  
Bang bang that awful sound  
Bang bang my baby shot me down

Bang bang you shot me right between my eyes  
Bang bang you can't go paralyzed  
Bang bang bang bang bang bang  
Bang bang oh baby I'm laying on the ground  
Bang bang I'll never come around

Bang bang  
Bang bang  
Oh baby  
Bang bang  
Oh baby come and wrap me  
Bang bang  
You see how sweet it's gonna be

Bang bang  
Bang bang  
Bang bang  
Oh my baby my baby shot me down  
Bang bang  
I'm up on the ground now

Song Title: Bang Bang (My Baby Shot Me Down)  
Sentiment Score: -0.344  
Lyrics:

I was five and he was six  
We rode on horses made of sticks  
He wore black and I wore white  
He would always win the fight

Bang bang, he shot me down  
Bang bang, I hit the ground  
Bang bang, that awful sound  
Bang bang, my baby shot me down

Seasons came and changed the time  
When I grew up I called him mine  
He would always laugh and say  
Remember when we used to play

Bang bang, I shot you down  
Bang bang, you hit the ground  
Bang bang, that awful sound  
Bang bang, I used to shoot you down

Music played and people sang  
Just for me the church bells rang

Now he's gone I don't know why  
And 'til this day, sometimes I cry  
He didn't even say goodbye  
He didn't take the time to lie

Bang bang, he shot me down  
Bang bang, I hit the ground  
Bang bang, that awful sound  
Bang bang, my baby shot me down

Song Title: Cry Myself To Sleep  
Sentiment Score: -0.25  
Lyrics:

Every night, I lay my head  
On my pillow on my bed  
And I just cry myself to sleep

I know I shouldn't cry  
Over words that were all lies  
But still, I cry myself to sleep

Each night, I fight the tears  
But still they fall  
And all the memories linger on  
He's gone, he's gone  
And now there's nothing but to cry  
Cry myself to sleep  
Still, I cry myself to sleep

Each night, I fight those tears  
But still, they fall  
And all the memories linger on  
He's gone, he's gone, he's gone  
And now there's nothing but to cry

Ah, cry myself to sleep  
Ah, cry myself to sleep  
Ah, cry myself to sleep

```
[ ]: # Filter data for the artist 'Robyn'
robyn_df = lyrics_df[lyrics_df['Artist'] == 'robyn']

robyn_highest_sentiments = robyn_df.sort_values(by='Sentiment Score',
↪ascending=False).head(3)
robyn_lowest_sentiments = robyn_df.sort_values(by='Sentiment Score',
↪ascending=True).head(3)

# Display the song title, sentiment score, and lyrics of the songs with the
↪highest sentiments
print("Top 3 Songs with Highest Sentiments for Robyn:")
for idx, row in robyn_highest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")

# Display the song title, sentiment score, and lyrics of the songs with the
↪lowest sentiments
print("\nTop 3 Songs with Lowest Sentiments for Robyn:")
for idx, row in robyn_lowest_sentiments.iterrows():
    rounded_sentiment = round(row['Sentiment Score'], 3)
    print(f"\nSong Title: {row['Song Title']}")
    print(f"Sentiment Score: {rounded_sentiment}")
    print(f"Lyrics:\n{row['Lyrics']}\n")
```

Top 3 Songs with Highest Sentiments for Robyn:

Song Title: Baby Forgive Me  
Sentiment Score: 0.52  
Lyrics:

Here come the night  
In your eyes  
Baby, be brave  
Be wise  
It's up to you  
You do what you like, mmm  
Won't you give it a chance, baby?



Just one more try

Baby forgive me  
Baby forgive me  
Baby forgive me  
Baby forgive me

(Won't you give it a chance, baby?)  
Won't you give it a chance, baby?  
Just one more try  
One more try  
Yeah, eh

You got the power  
You set the price  
But baby, be fair  
Be nice  
You say you want to be happy  
Then you got to put your love on the line  
Just let me make you smile again, baby  
I know we can work it out  
Yes, I know we can

Baby forgive me  
Yeah  
Baby forgive me  
Baby forgive me  
Baby forgive me  
Baby forgive me  
Baby forgive me  
Baby forgive me  
Baby forgive me

Song Title: Love Is Free  
Sentiment Score: 0.399  
Lyrics:

Free  
Love is free, baby  
Free  
Love is free, baby  
Boom boom boom boom boom chica boom  
Let me give it to you, baby  
Chica boom chica boom chica boom

Chica boom chica boom chica boom  
Free  
Love is free, baby  
Free  
Love is free, baby  
Boom boom boom boom boom chica boom  
Let me give it to you, baby

I'ma give it to you, baby  
I'ma give it when I'm ready  
Some lose, some steady  
Some light, some heavy  
It's all over this city  
Sometimes in the ugly, sometimes in the pretty  
You never know where you get it cause you can't control it and you can't unfold  
it, slow down

I'ma give it to you, baby  
I'ma give it when I'm ready  
Some lose, some steady  
Some light, some heavy  
It's all over this city  
Sometimes in the ugly, sometimes in the pretty  
You never know where you get it cause you can't control it and you can't unfold  
it, slow down

Free  
Love is free, baby  
Free  
Love is free, baby  
Boom boom boom boom boom chica boom  
Let me give it to you, baby  
Yeah! Yeah! Yeah! Yeah!  
Love is free, baby  
Love is free, baby

I'ma give it to you, baby  
I'ma give it like a motha  
Safe like a rubber  
Mutter like a stutter  
It's all over this city  
Sometimes in the nitty, sometimes in the gritty  
You know I'ma give it to you better  
I'ma give you love forever  
No, you can't control it, slow down

I'ma give it to you, baby  
I'ma give it like a motha

Safe like a rubber  
Mutter like a stutter  
It's all over this city  
Sometimes in the nitty, sometimes in the gritty  
You know I'ma give it to you better  
I'ma give you love forever  
No, you can't control it, slow down

Free  
Love is free, baby  
Free  
Love is free, baby  
Boom boom boom boom boom chica boom  
Let me give it to you, baby  
Boom boom boom boom boom  
Chica boom chica boom chica boom  
Boom boom boom boom boom  
Chica boom chica boom chica boom  
Free  
Love is free, baby  
Free  
Love is free, baby

AprÃ©ndelo, aprÃ©ndelo  
Te lo digo right now, sÃ³lo entiÃ©ndelo  
AprÃ©ndelo, aprÃ©ndelo  
Te lo digo right now, sÃ³lo entiÃ©ndelo  
Slow down

AprÃ©ndelo, aprÃ©ndelo  
Te lo digo right now, sÃ³lo entiÃ©ndelo  
AprÃ©ndelo, aprÃ©ndelo  
Te lo digo right now, sÃ³lo entiÃ©ndelo  
Slow down

I'ma give it to you, baby  
I'ma give it when I'm ready  
Some lose, some steady  
Some light, some heavy  
It's all over this city  
Sometimes in the ugly, sometimes in the pretty  
You never know where you get it cause you can't control it and you can't unfold  
it, slow down

Slow down [x6]  
Free  
Love is free, baby  
Love is free, baby

So free [x4]  
You know  
Love is free  
So free  
Free â Love is free, baby [x8]  
So free

Song Title: Between The Lines  
Sentiment Score: 0.315  
Lyrics:

Even reading in between the lines

Every day, you hit my phone up  
Every time  
(You hit my phone up)  
It makes my heart jump  
I want you to say it, baby  
(It makes my heart jump)  
Say it like you mean it  
It's right there on the tip of your tongue  
(You hit my phone up)  
And I can feel it  
And I like it baby  
Don't you stop  
(Don't stop what you're doing, baby)  
You know I like it  
You stretch it out  
(You know I like it)  
You give massages  
It's not your words  
(You know I like it)  
It's what's in between them  
There's no need to spell out  
(It makes my heart jump)  
I know you want it  
And I like it baby

I'm reading in between the lines  
I'm reading in between the lines  
(You got me reading in between the lines)  
I'm reading in between the lines  
(Even reading in between the lines)  
I'm reading in between the lines

(You got me reading in between the lines)  
And I like it, baby  
And I like it, baby  
(Even reading in between the lines)

I don't mind  
(i don't really mind it baby)  
When we get silent  
Pressure's rising, it's so intense  
(When we get silent)  
We're making diamonds  
There's no need to say it baby  
(We're making diamonds)  
'Cause I can tell you mean it  
All over the tip of your tongue  
(We're making diamonds)  
You got me spaced out  
And I like it, baby

I'm reading in between the lines  
I'm reading in between the lines  
(You got me reading in between the lines)  
I'm reading in between the lines  
(Even reading in between the lines)  
I'm reading in between the lines  
(You got me reading in between the lines)  
And I like it, baby  
And I like it, baby  
(Even reading in between the lines)

And I like it, baby  
And I like it  
And I like it, baby  
And I like it  
(Relax)  
(That's amazing)  
You got me reading in between the lines  
(That shit's so good)  
(Relax)  
You got me reading in between the lines  
(Amazing)

Top 3 Songs with Lowest Sentiments for Robyn:

Song Title: Don't Fucking Tell Me What To Do  
Sentiment Score: -0.517

Lyrics:

My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me

My smoking is killing me  
My diet is killing me  
My heels are killing me  
My shopping's killing me  
My ego is killing me  
Can't sleep, it's killing me  
My label's killing me  
Kickdrum

My phone is killing me  
My email is killing me  
These hours are killing me  
My tour is killing me  
This flight is killing me  
My manager's killing me  
My mother's killing me  
My landlord's killing me  
My boss is killing me  
The TV is killing me  
Your nagging is killing me  
My boyfriend's killing me  
My talking's killing me  
Killing me  
Killing me

Can't sleep, it's killing me  
My dreams are killing me  
TV is killing me

My talking's killing me  
Let go, you're killing me  
Ease up, you're killing me  
Calm down, you're killing me  
My god, you're killing me

My drinking is killing me  
My smoking is killing me  
My head is killing me  
My mind is killing me  
My back is killing me  
My neck is killing me  
Your nagging is killing me  
My gut is killing me  
My PMS is killing me  
My email is killing me  
These hours are killing me  
My tour is killing me  
This flight is killing me  
My manager's killing me  
My mother's killing me  
My landlord's killing me  
My smoking is killing me  
The TV is killing me  
Your nagging is killing me  
Ease up, you're killing me  
Let go, you're killing me  
Calm down, you're killing me  
My god, you're killing me

Don't fucking tell me what to do, do  
Don't fucking tell me what to do, do, do, do, do  
Don't fucking tell me what to do  
Don't fucking tell me what to do, do  
Don't fucking tell me what to do, do  
Don't fucking tell me what to do  
Don't fucking tell me what to do  
Don't fucking tell me what to do  
Don't fucking tell me what to do

Song Title: Don't Fucking Tell Me What To Do

Sentiment Score: -0.517

Lyrics:

My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me  
My drinking is killing me

My smoking is killing me  
My diet is killing me  
My heels are killing me  
My shopping's killing me  
My ego is killing me  
Can't sleep, it's killing me  
My label's killing me  
Kickdrum

My phone is killing me  
My email is killing me  
These hours are killing me  
My tour is killing me  
This flight is killing me  
My manager's killing me  
My mother's killing me  
My landlord's killing me  
My boss is killing me  
The TV is killing me  
Your nagging is killing me  
My boyfriend's killing me  
My talking's killing me  
Killing me  
Killing me

Can't sleep, it's killing me  
My dreams are killing me  
TV is killing me  
My talking's killing me  
Let go, you're killing me  
Ease up, you're killing me  
Calm down, you're killing me



My god, you're killing me

My drinking is killing me  
My smoking is killing me  
My head is killing me  
My mind is killing me  
My back is killing me  
My neck is killing me  
Your nagging is killing me  
My gut is killing me  
My PMS is killing me  
My email is killing me  
These hours are killing me  
My tour is killing me  
This flight is killing me  
My manager's killing me  
My mother's killing me  
My landlord's killing me  
My smoking is killing me  
The TV is killing me  
Your nagging is killing me  
Ease up, you're killing me  
Let go, you're killing me  
Calm down, you're killing me  
My god, you're killing me

Don't fucking tell me what to do, do  
Don't fucking tell me what to do, do, do, do, do  
Don't fucking tell me what to do  
Don't fucking tell me what to do, do  
Don't fucking tell me what to do, do  
Don't fucking tell me what to do  
Don't fucking tell me what to do  
Don't fucking tell me what to do  
Don't fucking tell me what to do

Song Title: Criminal Intent

Sentiment Score: -0.181

Lyrics:

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, she's got criminal intent

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, she's got criminal intent

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, I got criminal intent

- Will the defendant please rise? State your full name for the record.
- Robyn
- Do you wish to say anything before the sentence is imposed?
- I do your Honor!

You know, from time to time  
I need to get down  
Unwind and just bump and grind  
Get my shot on, have some fun  
A little dirty never hurt anyone  
I admit, I can get somewhat X-rated on the floor  
But your Honor, how's that something you get incarcerated for?

I-I-I done nothing that's wrong  
?? something that's frowned upon  
I object most strongly Judge, they played my song

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, she's got criminal intent

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, I got criminal intent  
Somebody alert the authorities, she's got criminal intent

Y-yo-yo Judge, may the record reflect the fact  
I don't have any priors  
Besides, would you pardon me  
For being inappropriately attired?  
But yo, listen, them cuffs down at county  
Totally ripped up my pantyhose  
And some snitch punk at legal aid  
Stole my voucher for court clothes

I done nothing that's wrong  
?? something that's frowned upon  
I object most strongly Judge, they played my song

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, she's got criminal intent

Somebody alert the authorities, I got criminal intent  
Conspiracy to engage in lewd and indecent acts and events  
I'mma wind it, grind it, oh my, I'mma say it again  
Somebody alert the authorities, I got criminal intent  
Somebody alert the authorities, she's got criminal intent

### 1.2.1 Questions

Q: Overall, which artist has the higher average sentiment per song?

A: CityAlight has the highest average sentiment score per song with a value of 0.208. Cher has the lowest with 0.053.

---

Q: For your first artist, what are the three songs that have the highest and lowest sentiments? Print the lyrics of those songs to the screen. What do you think is driving the sentiment score?

A: The three songs with the highest sentiments for CityAlight are “Good And Gracious King”, “God Is Over All”, and “The Love Of The Father”. The three songs with the lowest sentiments for CityAlight are “Washed By The Blood”, “In Christ Alone (Live From Sydney)”, and “Jesus Is Alive”.

For worship songs, the chorus is often repeated which will help drive the sentiment score. Specifically for the top song, the words “good”, “gracious”, and “holy” are repeated several times. With these being positive sentiment terms, the overall sentiment will be pointed in that direction. For the bottom 3 songs, they are all discussing death and sin which are obvious negative sentiment terms.

---

Q: For your second artist, what are the three songs that have the highest and lowest sentiments? Print the lyrics of those songs to the screen. What do you think is driving the sentiment score?

A: The three songs with the highest sentiments for Pat Barrett are “God Is So Good (You Are Worthy)”, “Sing Soul Sing”, and “When I Look At The Blood”. The three songs with the lowest sentiments for Pat Barrett are “Scatter”, “No Body”, and “Cada Mañ±ana”.

Once again, worship songs often have choruses that are repeated which will help drive the sentiment score. Each of the top songs have a specific word repeated many times: good, hope/sing, and love. For instance, the top song has the word “good” show up 39 times! The bottom songs are in relation

to “enemy” and “darkness” which bring their scores down despite having a good amount of positive sentiment words as well.

---

Q: For your third artist, what are the three songs that have the highest and lowest sentiments? Print the lyrics of those songs to the screen. What do you think is driving the sentiment score?

A: The three songs with the highest sentiments for Cher are “My Love”, “Sunny”, and “Move Me”. The three songs with the lowest sentiments for Cher are “Bang-Bang”, “Bang Bang (My Baby Shot Me Down)”, and “Cry Myself To Sleep”. Among the top positive sentiment songs, they were all centered around the theme of love which is a positive word. Interestingly, two of the negative sentiment songs both had ‘bang’ as a reoccurring word. The other kept referencing the word ‘cry’ which helped bring the overall sentiment score down.

---

Q: For your fourth artist, what are the three songs that have the highest and lowest sentiments? Print the lyrics of those songs to the screen. What do you think is driving the sentiment score?

A: The three songs with the highest sentiments for Robyn are “Baby Forgive Me”, “Love Is Free”, and “Between The Lines”. The three songs with the lowest sentiments for Robyn are two renditions of “Don’t F\*\*king Tell Me What To Do” and “Criminal Intent”. While having to ask for forgiveness implies a negative situation occurred, the sentiment score of this song was still high as it leads to many instances of praise and suggestions of how great love could be. The words ‘love’, ‘free’ and ‘like’ showed up often in the other two songs which led their scores to be positive. In the negative songs, the word ‘killing’ was in the majority of the line of the double-rendition while criminality and bad intentions were the topic of the other.

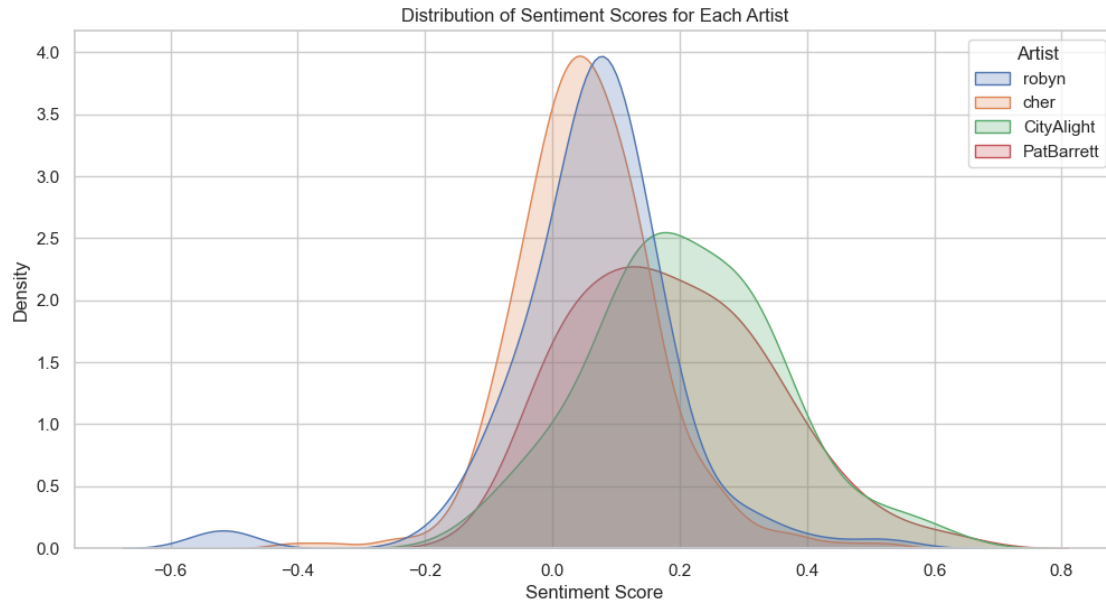
---

Q: Plot the distributions of the sentiment scores for each artist. You can use `seaborn` to plot densities or plot histograms in `matplotlib`.

```
[ ]: # Plot of the distributions of the sentiment scores for each artist
sns.set(style="whitegrid")
plt.figure(figsize=(12, 6))
ax = sns.kdeplot(data=lyrics_df, x='Sentiment Score', hue='Artist', fill=True,
                 common_norm=False)

# Set plot labels and title
ax.set_xlabel('Sentiment Score')
ax.set_ylabel('Density')
ax.set_title('Distribution of Sentiment Scores for Each Artist')

plt.show()
```



This density plot matches the takeaway from our average sentiment scoring. That is, the lyrics from Pat Barrett and CityAlight have higher positivity to them than the lyrics from Cher and Robyn.

### 1.3 Sentiment Analysis on Twitter Descriptions

In this section, define two sets of emojis you designate as positive and negative. Make sure to have at least 10 emojis per set. You can learn about the most popular emojis on Twitter at [the emoji tracker](#).

Associate your positive emojis with a score of +1, negative with -1. Score the average sentiment of your two artists based on the Twitter descriptions of their followers. The average sentiment can just be the total score divided by number of followers. You do not need to calculate sentiment on non-emoji content for this section.

```
[ ]: positive_emojis = {"\U0001F602", "\U00002764", "\U0001F499", "\U0001F495",
↳ "\U0001F48C", "\U0001F60D", "\U0001F618", "\U0001F60A", "\U0001F929",
↳ "\U00002728",
↳ "\U0001F917", "\U0001F60E", "\U0001F602", "\U0001F49B",
↳ "\U0001F44D", "\U0001F44F", "\U0001F64C", "\U0001FAF6",
↳ "\U0001F64F", "\U0001F525"}

negative_emojis = {"\U0001F44E", "\U0001F614", "\U0001F612", "\U0001F629",
↳ "\U0001F494", "\U0001F622", "\U0001F61E", "\U0001F62A", "\U0001F615",
↳ "\U0001F621", "\U0001F62B", "\U0001F624", "\U0001F62C",
↳ "\U0001F623"}
```

```
[ ]: # Create DataFrames for positive and negative emojis with a 'Score' column
positive_df = pd.DataFrame({'Emoji': list(positive_emojis), 'Score': 1})
negative_df = pd.DataFrame({'Emoji': list(negative_emojis), 'Score': -1})

# Concatenate positive and negative DataFrames
emojis_df = pd.concat([positive_df, negative_df], ignore_index=True)

print("Emojis DataFrame:")
print(emojis_df.head(3))
```

Emojis DataFrame:

	Emoji	Score
0		1
1		1
2		1

```
[ ]: def emoji_tokenize(text):
    tokens = re.split(r'', text)
    return tokens
```

```
[ ]: def emoji_sent_score(text):
    emoji_sentiment_score = 0
    # Convert to string if not already a string
    text_str = str(text)

    bag_of_chars = emoji_tokenize(text_str)

    for emoji_used in bag_of_chars:
        if emoji_used in emojis_df['Emoji'].values:
            emoji_sentiment_score += emojis_df.loc[emojis_df['Emoji'] ==
↳ emoji_used, 'Score'].values[0]

    return emoji_sentiment_score
```

```
[ ]: artist_files = {'cher': 'cher_followers_data.txt',
                    'robyn': 'robynkonihiwa_followers_data.txt'}

twitter_data = pd.read_csv(data_location + twitter_folder +
↳ artist_files['cher'],
                           sep="\t",
                           quoting=3)

twitter_data['artist'] = "cher"

twitter_data_2 = pd.read_csv(data_location + twitter_folder +
↳ artist_files['robyn'],
                             sep="\t",
```

```

                                quoting=3)
twitter_data_2['artist'] = "robyn"

twitter_data = pd.concat([
    twitter_data, twitter_data_2])

del(twitter_data_2)

```

```
[ ]: # Because of the runtime, we will only take the first and last 5000 rows
```

```

first_5000_rows = twitter_data.head(5000)
last_5000_rows = twitter_data.tail(5000)

# Concatenate the two subsets into a new DataFrame
condensed_twitter_data = pd.concat([first_5000_rows, last_5000_rows])

print("Condensed Twitter Data:")
condensed_twitter_data

```

Condensed Twitter Data:

```
[ ]:
```

	screen_name	name	id	location	\
0	hsmcnp	Country Girl	35152213	NaN	
1	horrormomy	Jeny	742153090850164742	Earth	
2	anju79990584	anju	1496463006451974150	NaN	
3	gallionjenna	J	3366479914	NaN	
4	bcscomm	bcscomm	83915043	Washington, DC	
...	...	...	...	...	
358367	jakegiles	Jake Giles	19725102	LA	
358368	axelbluhme	Axel Bluhme	19573759	DK	
358369	RayRayRay27	Rachael :)	19919217	Oldham	
358370	bhandberg	Ben Handberg	12642462	Sydney	
358371	takemeback	Christine	15022058	New Jersey	

	followers_count	friends_count	\
0	1302	1014	
1	81	514	
2	13	140	
3	752	556	
4	888	2891	
...	...	...	
358367	7690	2165	
358368	238	1565	
358369	762	1479	
358370	432	593	
358371	182	260	

```
[10000 rows x 8 columns]
```

```
[ ]: condensed_twitter_sentiment_df
```

	Emoji	Sentiment	Score
0			0
1			0
2			0
3			0
4			0
...		...	
358367			0
358368			0
358369			1
358370			0



358371

0

[10000 rows x 3 columns]

```
[ ]: sentiment_per_artist_twitter = condensed_twitter_sentiment_df.  
    ↳groupby('artist')['Emoji Sentiment Score'].mean().round(3)  
sentiment_per_artist_twitter
```

```
[ ]: artist  
cher      0.086  
robyn     0.024  
Name: Emoji Sentiment Score, dtype: float64
```

```
[ ]: # Function to count the occurrences of each emoji  
def count_emojis(text):  
    text_str = str(text)  
    emoji_counts = pd.Series(0, index=emojis_df['Emoji'])  
    bag_of_chars = emoji_tokenize(text_str)  
    for char in bag_of_chars:  
        if char in emojis_df['Emoji'].values:  
            emoji_counts[char] += 1  
    return emoji_counts  
  
# Group by artist  
grouped_by_artist = condensed_twitter_sentiment_df.  
    ↳groupby('artist')['description']  
  
# Create an empty DataFrame to store emoji amounts  
emoji_amounts = pd.DataFrame()  
  
# Apply the function to each artist's description  
for artist, group in grouped_by_artist:  
    emoji_amounts[artist] = group.apply(count_emojis).sum()  
  
# Display the resulting DataFrame  
print("Emoji Amounts DataFrame:")  
emoji_amounts
```

Emoji Amounts DataFrame:

```
[ ]:      cher  robyn  
Emoji  
      2      1  
      3      3  
     92     15  
      6      1  
     20      6
```

0	0
9	4
5	5
5	1
2	1
12	6
11	0
20	5
29	6
13	7
105	46
82	12
8	0
12	3
1	0
0	0
2	0
0	0
0	0
0	0
0	1
3	0
0	0
1	0
0	0
0	0
0	0
0	0

Q: What is the average sentiment of your two artists?

A: Based on the condensed data, which is likely to closely represent the overall data, the twitter description sentiment scores for Cher and Robyn were 0.086 and 0.024, respectively. Thus, the twitter followers of Cher on average have a more positive sentiment in their twitter descriptions based on emoji use only.

---

Q: Which positive emoji is the most popular for each artist? Which negative emoji?

A: Based on the condensed data, the positive emoji that appeared the most in Cher's twitter follower descriptions is the heart , while the most common negative emoji is broken heart . The positive emoji that appeared the most in Robyn's twitter follower descriptions is also the heart , while the most common negative emoji is the weary face .