Analyze and visualize sentiment patterns in social media data to understand public opinion and attitudes towards specific topics or brands.

In [3]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

read the data

In [4]:
```
columns = ['ID', 'entity', 'sentiment', 'comment']
df = pd.read_csv('data/twitter_training.csv', header=None, names=columns)
df.head()
```

Out[4]:

	ID	entity	sentiment	comment
0	2401	Borderlands	Positive	im getting on borderlands and i will murder yo...
1	2401	Borderlands	Positive	I am coming to the borders and I will kill you...
2	2401	Borderlands	Positive	im getting on borderlands and i will kill you ...
3	2401	Borderlands	Positive	im coming on borderlands and i will murder you...
4	2401	Borderlands	Positive	im getting on borderlands 2 and i will murder ...

EDA

In [5]:
```
df.shape
```

Out[5]:
```
(74682, 4)
```

In [6]:
```
df['entity'].value_counts()
```

Out[6]:
```
entity
TomClancysRainbowSix                  2400
MaddenNFL                             2400
Microsoft                             2400
LeagueOfLegends                       2394
CallOfDuty                            2394
Verizon                               2382
CallOfDutyBlackopsColdWar             2376
ApexLegends                           2376
Facebook                              2370
WorldOfCraft                          2364
Dota2                                 2364
NBA2K                                 2352
TomClancysGhostRecon                  2346
Battlefield                           2346
FIFA                                  2340
Xbox(Xseries)                         2334
Overwatch                             2334
johnson&johnson                       2328
Amazon                                2316
PlayStation5(PS5)                     2310
HomeDepot                             2310
Cyberpunk2077                         2304
CS-GO                                 2304
GrandTheftAuto(GTA)                   2304
Hearthstone                           2298
Nvidia                                2298
Google                                2298
Borderlands                           2286
PlayerUnknownsBattlegrounds(PUBG)     2274
Fortnite                              2274
RedDeadRedemption(RDR)                2262
AssassinsCreed                        2244
Name: count, dtype: int64
```

In [7]:
```
df[df.duplicated()].count()
```

Out[7]:
```
ID           2700
entity       2700
sentiment    2700
comment      2340
dtype: int64
```

In [8]:
```
df = df.drop_duplicates()
df.shape
```

Out[8]:
```
(71982, 4)
```

In [9]:
```
df.isnull().sum()
```

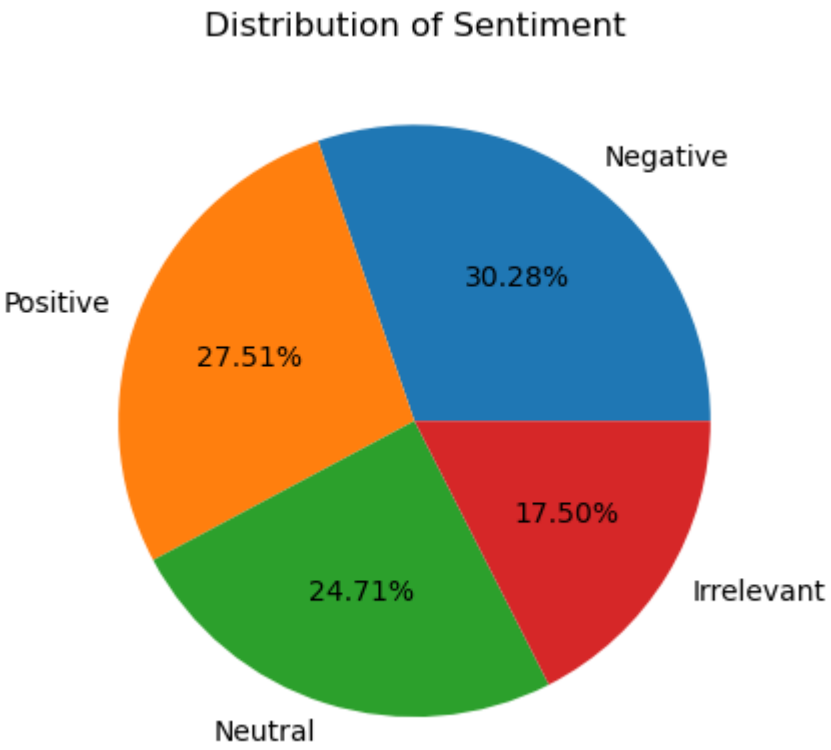
Out[9]:
```
ID             0
entity         0
sentiment      0
comment      326
dtype: int64
```

In [10]:
```
df = df.dropna()
df.shape
```

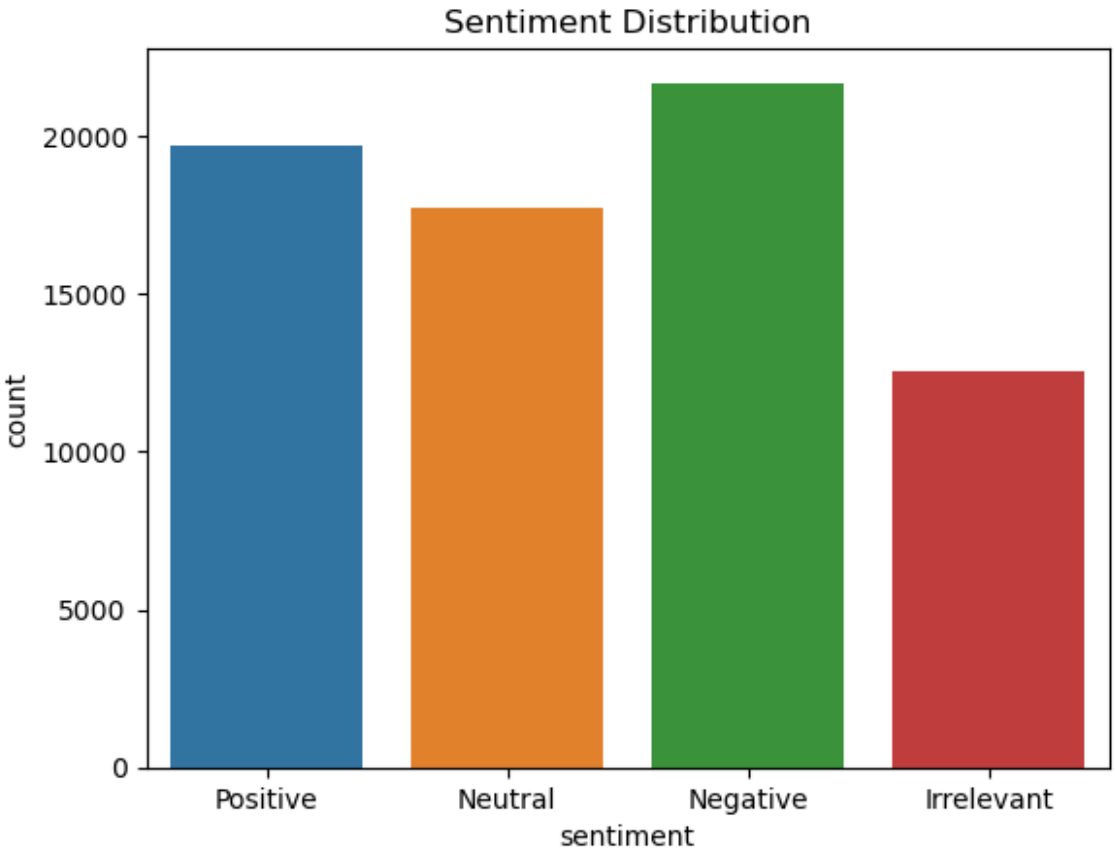
Out[10]: (71656, 4)

Sentiment Analysis

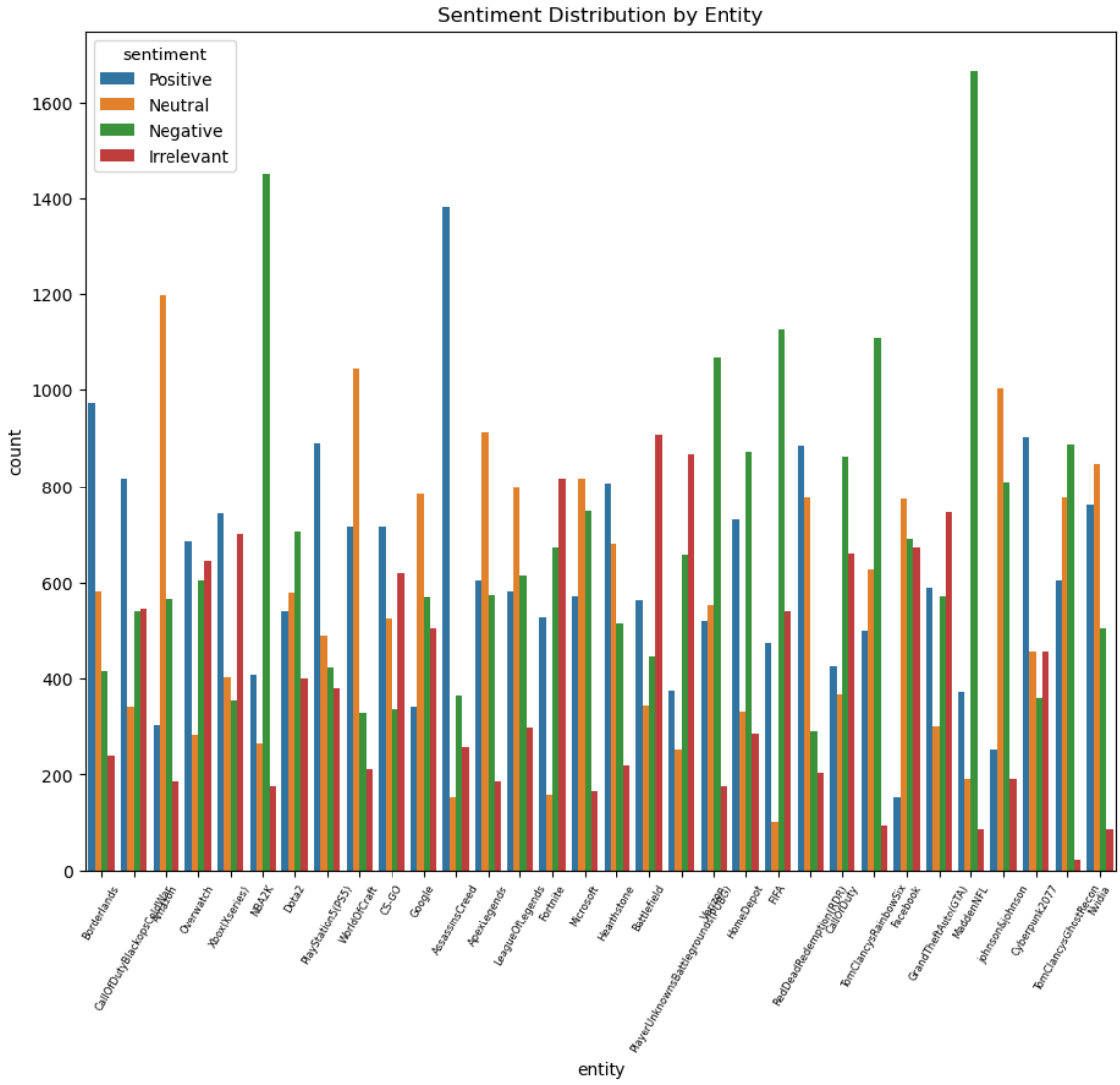
In [11]:
```
plt.figure()
plt.pie(x=df['sentiment'].value_counts().values, labels=df['sentiment'].val
plt.title('Distribution of Sentiment')
plt.show()
```



In [12]:
```
sns.countplot(x='sentiment', data=df)
plt.title('Sentiment Distribution')
plt.show()
```



In [13]:
```
plt.figure(figsize=(11,9))
sns.countplot(x='entity', hue='sentiment', data=df)
plt.title('Sentiment Distribution by Entity')
plt.xticks(rotation=60, fontsize=6)
plt.show()
```



word cloud

In [14]:
```
import re
import string
from nltk.corpus import stopwords
from nltk.stem import PorterStemmer
stopword=set(stopwords.words('english'))
```

In [15]:
```
def clean(comment):
    # Convert text to lowercase
    comment = comment.lower()

    # Remove URLs
    comment = re.sub(r'https?://\S+|www\.\S+', '', comment)

    # Remove HTML tags
    comment = re.sub('<.*?>', '', comment)

    # Remove punctuation
    comment = comment.translate(str.maketrans('', '', string.punctuation))

    # Remove newlines
    comment = comment.replace('\n', '')

    # Remove alphanumeric words
    comment = re.sub(r'\w*\d\w*', '', comment)

    # Remove stopwords
    stop_words = set(stopwords.words('english'))
    comment = ' '.join(word for word in comment.split() if word not in stop

    # Stemming
    stemmer = PorterStemmer()
    comment = ' '.join(stemmer.stem(word) for word in comment.split())

    return comment
```

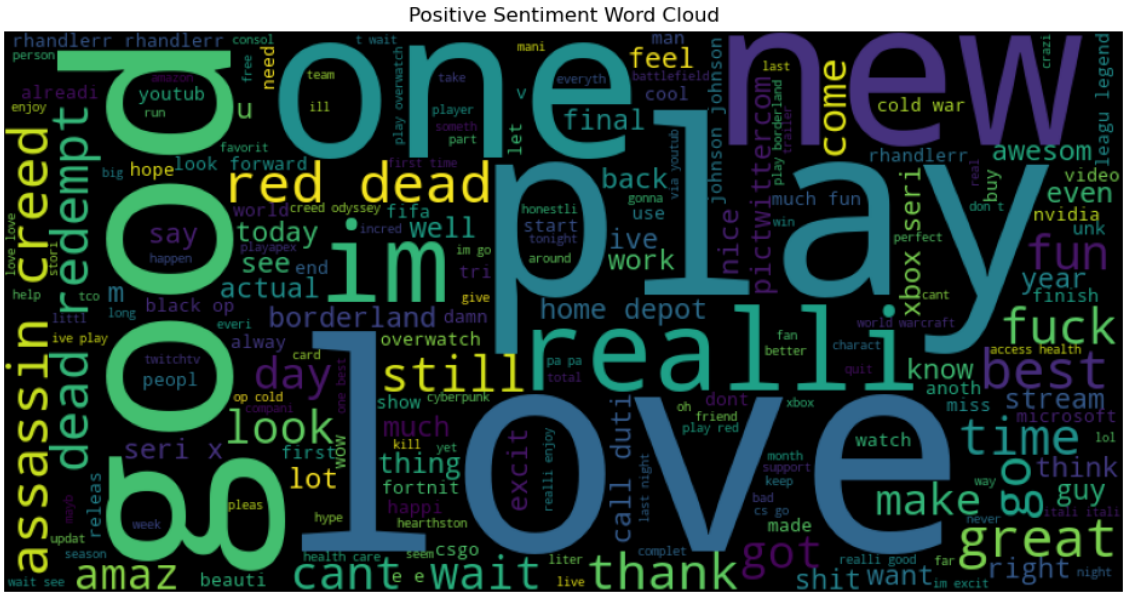
In [16]:
```
df["comment"] = df["comment"].apply(clean)
df.head()
```

Out[16]:

	ID	entity	sentiment	comment
0	2401	Borderlands	Positive	im get borderland murder
1	2401	Borderlands	Positive	come border kill
2	2401	Borderlands	Positive	im get borderland kill
3	2401	Borderlands	Positive	im come borderland murder
4	2401	Borderlands	Positive	im get borderland murder

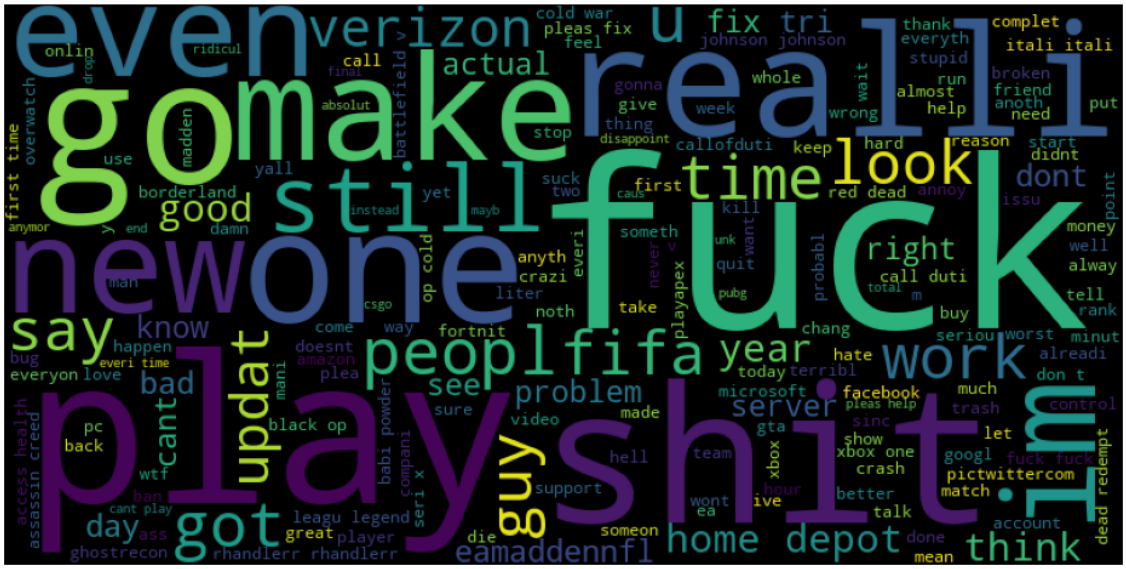
In [17]:
```
from wordcloud import WordCloud, STOPWORDS
```

In [22]:
```
positive = df[df['sentiment'] == 'Positive']['comment'].str.cat(sep=" ")
# Exclude the word "game" from the text data
positive = positive.replace("game", "")
if positive:
    wc = WordCloud(width=800, height=400, background_color='black').generat
    plt.figure(figsize=(12, 6))
    plt.title('Positive Sentiment Word Cloud')
    plt.imshow(wc)
    plt.axis("off")
    plt.show()
else:
    print("No data available for positive sentiment.")
```



In [23]:
```
negative = df[df['sentiment'] == 'Negative']['comment'].str.cat(sep=" ")
negative = negative.replace("game", "")
if negative.strip():
    wc = WordCloud(width=800, height=400, background_color='black').generat
    plt.figure(figsize=(12, 6))
    plt.title('Negative Sentiment Word Cloud')
    plt.imshow(wc)
    plt.axis("off")
    plt.show()
else:
    print("No data available for negative sentiment.")
```

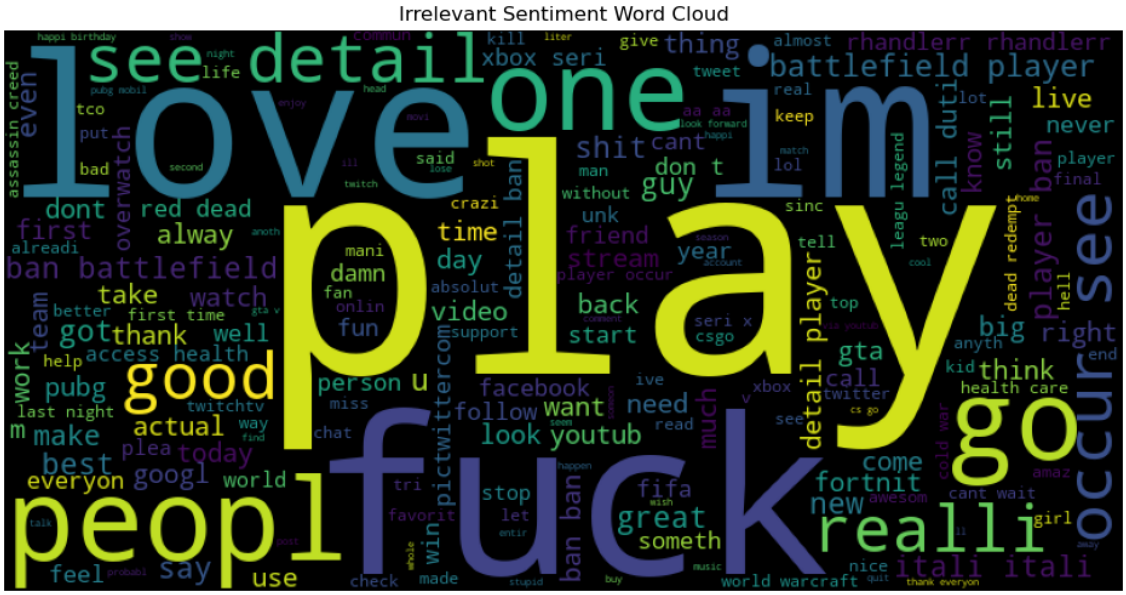
Negative Sentiment Word Cloud



In [27]:
```
neutral = df[df['sentiment'] == 'Neutral']['comment'].str.cat(sep=" ")
neutral = neutral.replace("game", "")
if neutral.strip():
    wc = WordCloud(width=800, height=400, background_color='black').generat
    plt.figure(figsize=(12, 6))
    plt.title('Neutral Sentiment Word Cloud')
    plt.imshow(wc)
    plt.axis("off")
    plt.show()
else:
    print("No data available for neutral sentiment.")
```

Neutral Sentiment Word Cloud

In [25]:
```
irrelevant = df[df['sentiment'] == 'Irrelevant']['comment'].str.cat(sep=" "
irrelevant = irrelevant.replace("game", "")
if irrelevant.strip():
    wc = WordCloud(width=800, height=400, background_color='black').generat
    plt.figure(figsize=(12, 6))
    plt.title('Irrelevant Sentiment Word Cloud')
    plt.imshow(wc)
    plt.axis("off")
    plt.show()
else:
    print("No data available for irrelevant sentiment.")
```



In [ ]:
```
```