Load and Preprocess the Data

```
# import library
import pandas as pd
import re
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.stem import WordNetLemmatizer
```

```
# Load the dataset
df=pd.read_csv("twitter_training.csv",header=None)
df.columns = ['id', 'game', 'sentiment', 'text']
```

```
df.head()
```

	id	game	sentiment	text
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 ...

Next steps: Generate code with df View recommended plots New interactive sheet

```
df['text'] = df['text'].astype(str)
```

```
# Preprocess the text
nltk.download('stopwords')
nltk.download('punkt')
nltk.download('wordnet')

stop_words = set(stopwords.words('english'))
lemmatizer = WordNetLemmatizer()
```

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

```
def preprocess_text(text):
    text = re.sub(r'http\S+|www\S+|https\S+', '', text, flags=re.MULTILINE)  # Remove URLs
    text = re.sub(r'\@\w+|\#', '', text)  # Remove mentions and hashtags
    text = re.sub(r'[^A-Za-z\s]', '', text)  # Remove special characters
    text = text.lower()  # Convert to lowercase
    tokens = word_tokenize(text)  # Tokenize the text
    filtered_words = [lemmatizer.lemmatize(w) for w in tokens if w not in stop_words]  # Remove stopwords and lemmatize
    return " ".join(filtered_words)
```

```
# Adding a new column 'cleaned_text' after preprocessing
df['cleaned_text'] = df['text'].apply(preprocess_text)
```

```
df.columns
```

```
Index(['id', 'game', 'sentiment', 'text', 'cleaned_text'], dtype='object')
```

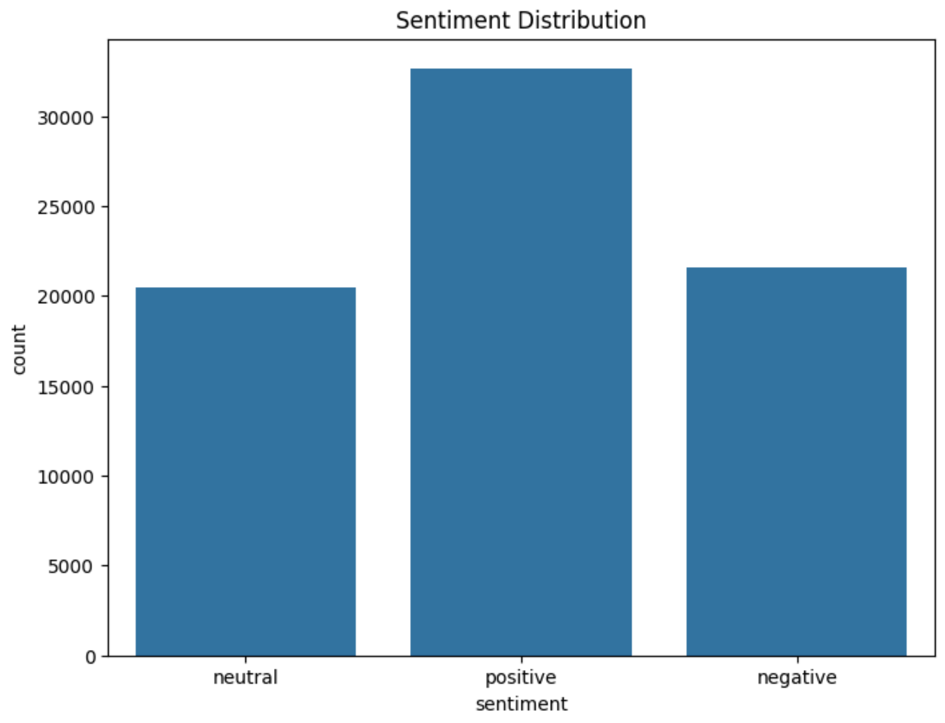
Sentiment Analysis

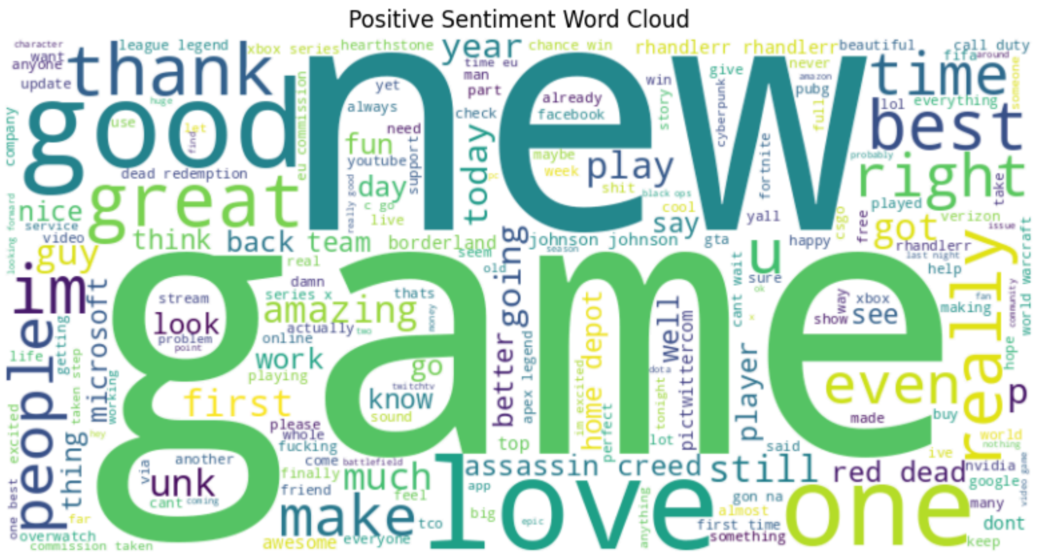
```
from textblob import TextBlob

# Function to get sentiment score
def get_sentiment(text):
    analysis = TextBlob(text)
    return analysis.sentiment.polarity

# Apply sentiment analysis
df['sentiment_score'] = df['cleaned_text'].apply(get_sentiment)

# Label the sentiments
df['sentiment'] = df['sentiment_score'].apply(lambda x: 'positive' if x > 0 else ('negative' if x < 0 else 'neutral'))

# Display the sentiment
print(df[['cleaned_text', 'sentiment_score', 'sentiment']].head())
```

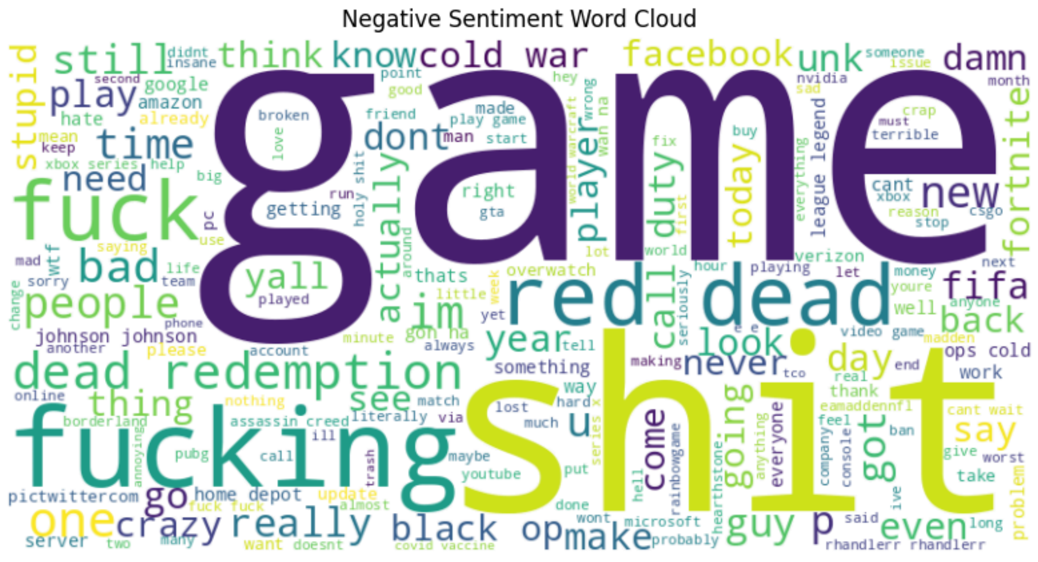
```
                   cleaned_text  sentiment_score sentiment
0  im getting borderland murder              0.0   neutral
1             coming border kill              0.0   neutral
2    im getting borderland kill              0.0   neutral
3   im coming borderland murder              0.0   neutral
4  im getting borderland murder              0.0   neutral
```

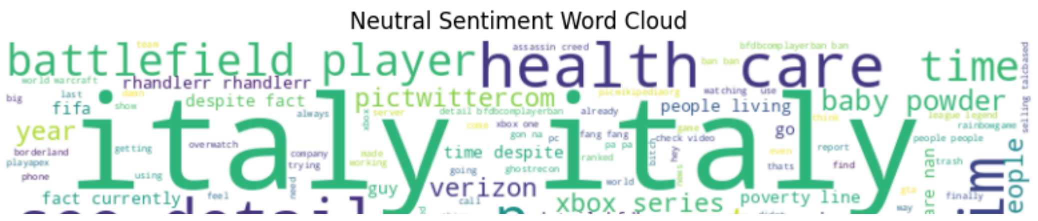
Data visualisation

```
import matplotlib.pyplot as plt
import seaborn as sns
from wordcloud import WordCloud

# Sentiment distribution
plt.figure(figsize=(8,6))
sns.countplot(x='sentiment', data=df)
plt.title('Sentiment Distribution')
plt.show()

# Word Clouds for each sentiment
for sentiment in ['positive', 'negative', 'neutral']:
    words = ' '.join(df[df['sentiment'] == sentiment]['cleaned_text'])
    wordcloud = WordCloud(width=800, height=400, background_color='white').generate(words)

    plt.figure(figsize=(10, 5))
    plt.imshow(wordcloud, interpolation='bilinear')
    plt.title(f'{sentiment.capitalize()} Sentiment Word Cloud')
    plt.axis('off')
    plt.show()
```


Sentiment Distribution
count
0
5000
10000
15000
20000
25000
30000
neutral
positive
negative
sentiment


Positive Sentiment Word Cloud
game
new
good
love
one
thank
best
time
great
right
really
people
im


Negative Sentiment Word Cloud
game
shit
fucking
red dead
fuck
dead redemption
still
think
know
cold war
facebook


Neutral Sentiment Word Cloud
italy
battlefield
player
health care
time
baby powder