Sentiment Analysis of Reddit Posts and Comments Using Python

Import Libraries and Setup

In [1]:
```
import praw
from textblob import TextBlob
import pandas as pd
import matplotlib.pyplot as plt
from wordcloud import WordCloud
import nltk
from nltk.corpus import stopwords
import datetime
```

In [2]:
```
# Download stopwords
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to
[nltk_data]     C:\Users\Tushar\AppData\Roaming\nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
```

Out[2]:
```
True
```

Set Up Reddit API Credentials

In [3]:
```
# Step 1: Set up Reddit API credentials
reddit = praw.Reddit(client_id='7mbWV1ZILon_zKpU-eBX1Q',
                     client_secret='0e5EHYQfIyNfZWijODKhyqYtW6twHA',
                     user_agent='SentimentAnalysisApp')
```

Collect Data from Reddit Subreddit

In [4]:
```
# Step 2: Collect data from a subreddit (posts + comments)
subreddit = reddit.subreddit('example')  # Change 'example' to your subreddit of interest
posts_data = []
comments_data = []
```

In [5]:
```
# Collect top 100 posts (you can modify the number)
for post in subreddit.top(limit=100):
    # Collect post title and its sentiment
    post_data = {'Title': post.title, 'Timestamp': datetime.datetime.utcfromtimestamp(post.created_utc)}
    posts_data.append(post_data)

    # Collect comments in the post
    post.comments.replace_more(limit=0)  # This removes "MoreComments" objects
    for comment in post.comments.list():
        comment_data = {'Title': post.title, 'Comment': comment.body, 'Timestamp': datetime.datetime.utcfromtimestamp(comment.created_utc)}
        comments_data.append(comment_data)
```

Create DataFrames for Posts and Comments

In [6]:
```
# Step 3: Create a DataFrame from the collected posts and comments
posts_df = pd.DataFrame(posts_data)
comments_df = pd.DataFrame(comments_data)
```

Perform Sentiment Analysis

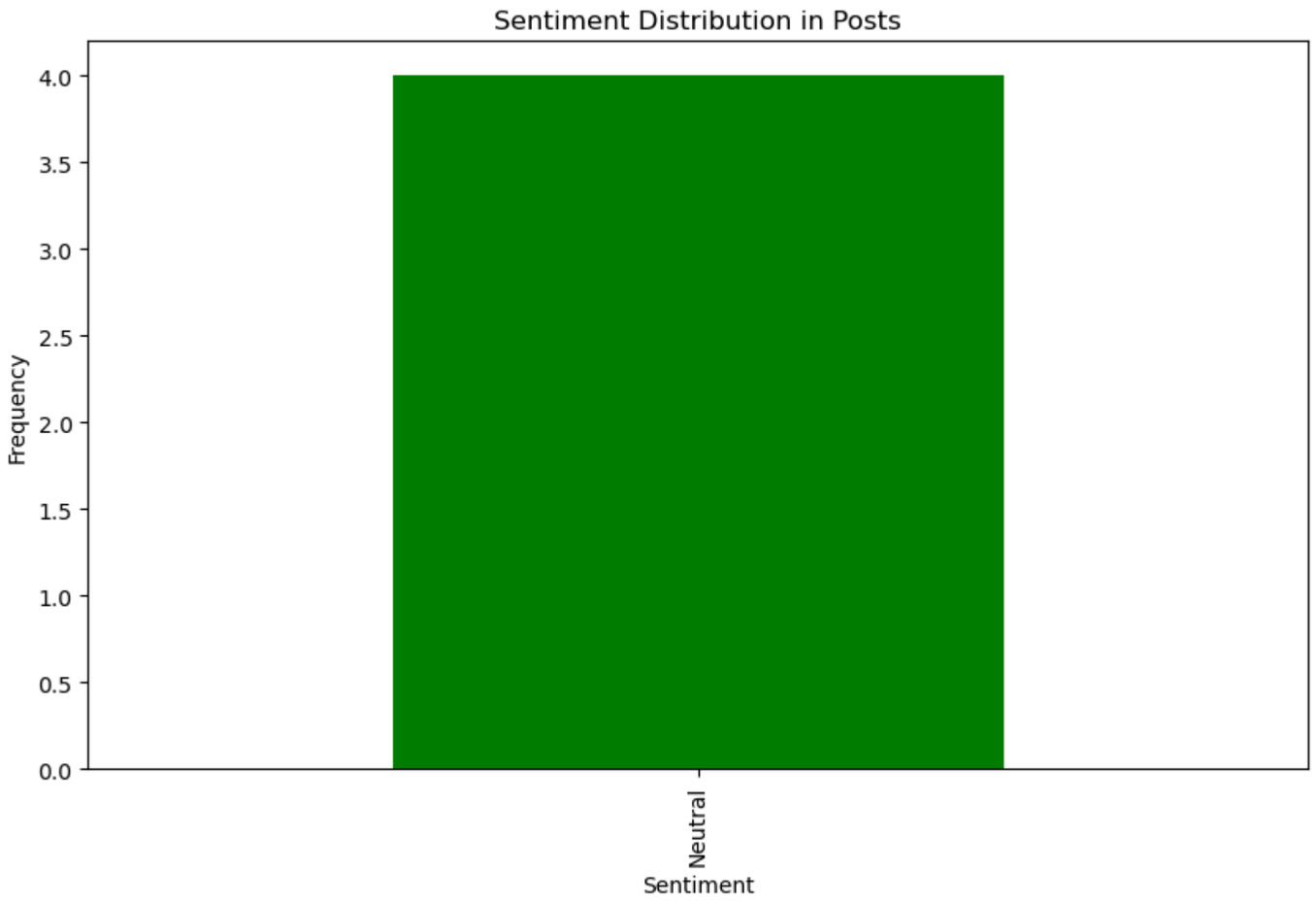
In [7]:
```
# Step 4: Sentiment Analysis using TextBlob for posts and comments
def analyze_sentiment(text):
    blob = TextBlob(text)
    sentiment = blob.sentiment.polarity  # Sentiment polarity: -1 to 1
    if sentiment > 0:
        return 'Positive'
    elif sentiment < 0:
        return 'Negative'
    else:
        return 'Neutral'

posts_df['Sentiment'] = posts_df['Title'].apply(analyze_sentiment)
comments_df['Sentiment'] = comments_df['Comment'].apply(analyze_sentiment)
```

Sentiment Breakdown and Visualization

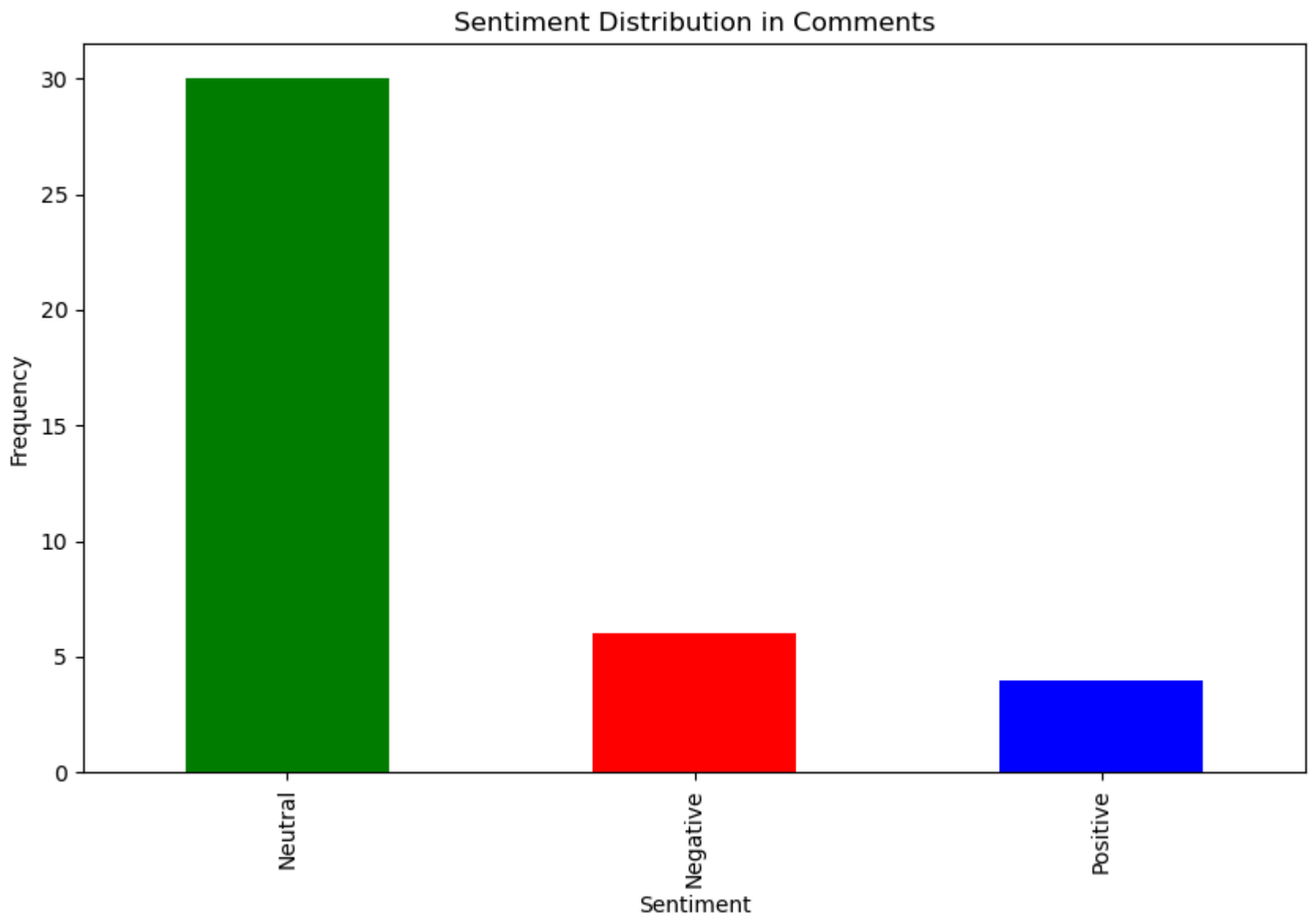
In [8]:
```
# Step 5: Sentiment Breakdown
sentiment_counts = posts_df['Sentiment'].value_counts()
print("Sentiment Breakdown (Posts):")
print(sentiment_counts)

sentiment_counts_comments = comments_df['Sentiment'].value_counts()
print("Sentiment Breakdown (Comments):")
print(sentiment_counts_comments)
```

```
Sentiment Breakdown (Posts):
Sentiment
Neutral    4
Name: count, dtype: int64
Sentiment Breakdown (Comments):
Sentiment
Neutral     30
Negative     6
Positive     4
Name: count, dtype: int64
```

In [9]:
```
# Step 6: Visualiz Sentiment Distribution for Posts and Comments
plt.figure(figsize=(10, 6))
posts_df['Sentiment'].value_counts().plot(kind='bar', color=['green', 'red', 'blue'])
plt.title('Sentiment Distribution in Posts')
plt.xlabel('Sentiment')
plt.ylabel('Frequency')
plt.show()
```



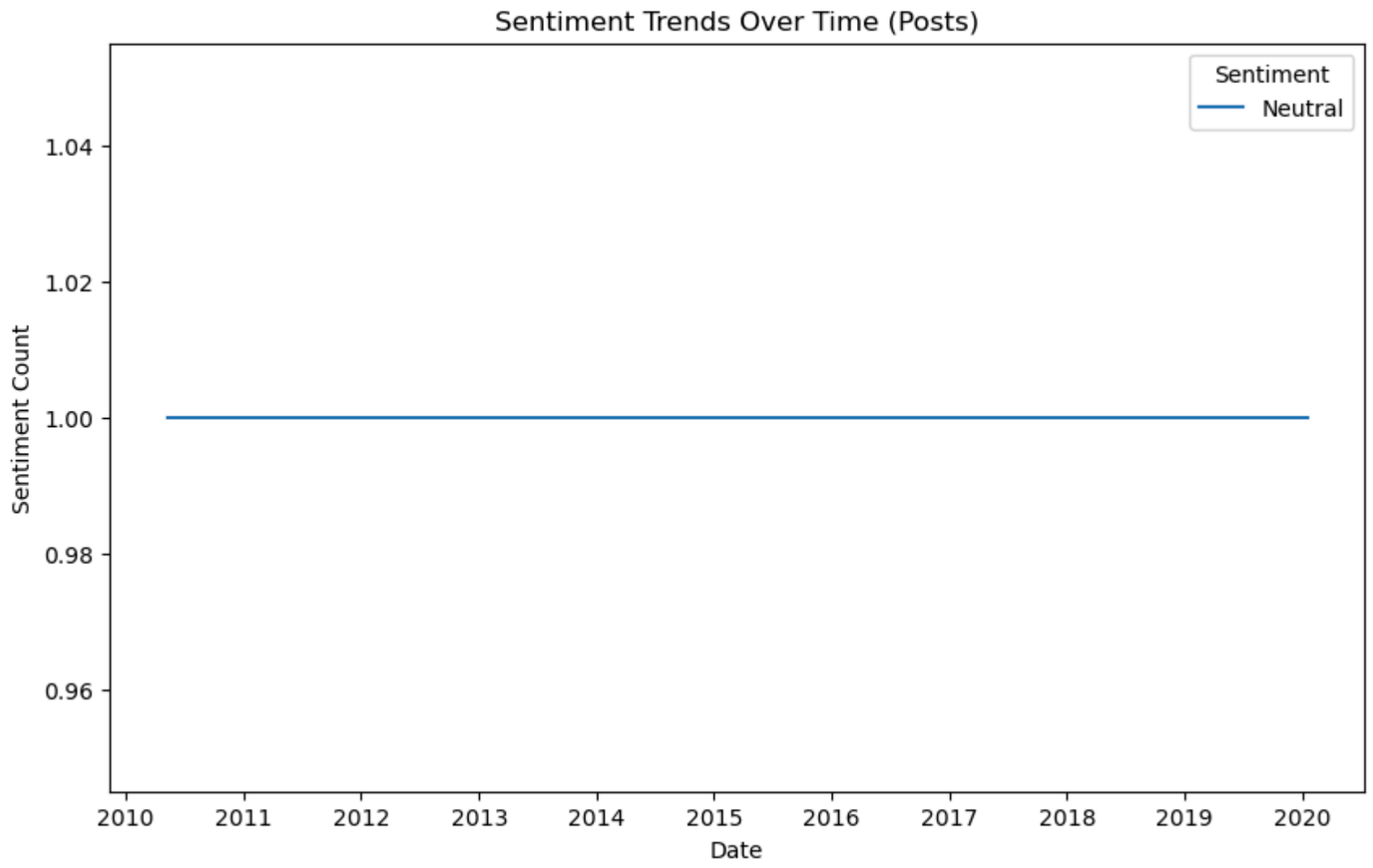
In [10]:
```
plt.figure(figsize=(10, 6))
comments_df['Sentiment'].value_counts().plot(kind='bar', color=['green', 'red', 'blue'])
plt.title('Sentiment Distribution in Comments')
plt.xlabel('Sentiment')
plt.ylabel('Frequency')
plt.show()
```



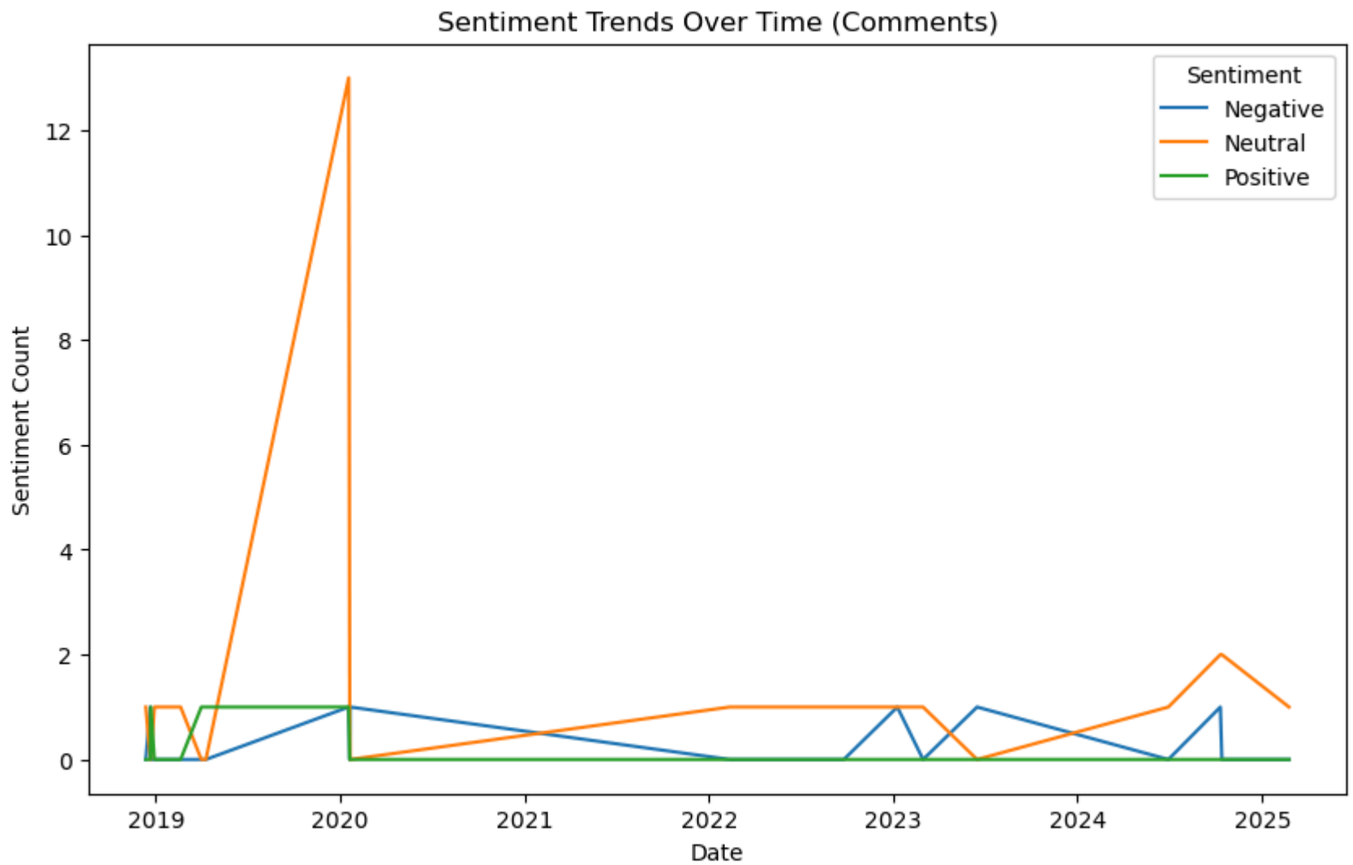
Sentiment Trends Over Time

In [11]:
```
# Step 7: Sentiment Trends Over Time
posts_df['Date'] = posts_df['Timestamp'].dt.date
comments_df['Date'] = comments_df['Timestamp'].dt.date

posts_sentiment_trend = posts_df.groupby(['Date', 'Sentiment']).size().unstack().fillna(0)
comments_sentiment_trend = comments_df.groupby(['Date', 'Sentiment']).size().unstack().fillna(0)
```

In [14]:
```
# Plotting sentiment trends for posts
posts_sentiment_trend.plot(kind='line', figsize=(10, 6), title='Sentiment Trends Over Time (Posts)')
plt.xlabel('Date')
plt.ylabel('Sentiment Count')
plt.show()
```



In [13]:
```
# Plotting sentiment trends for comments
comments_sentiment_trend.plot(kind='line', figsize=(10, 6), title='Sentiment Trends Over Time (Comments)')
plt.xlabel('Date')
plt.ylabel('Sentiment Count')
plt.show()
```

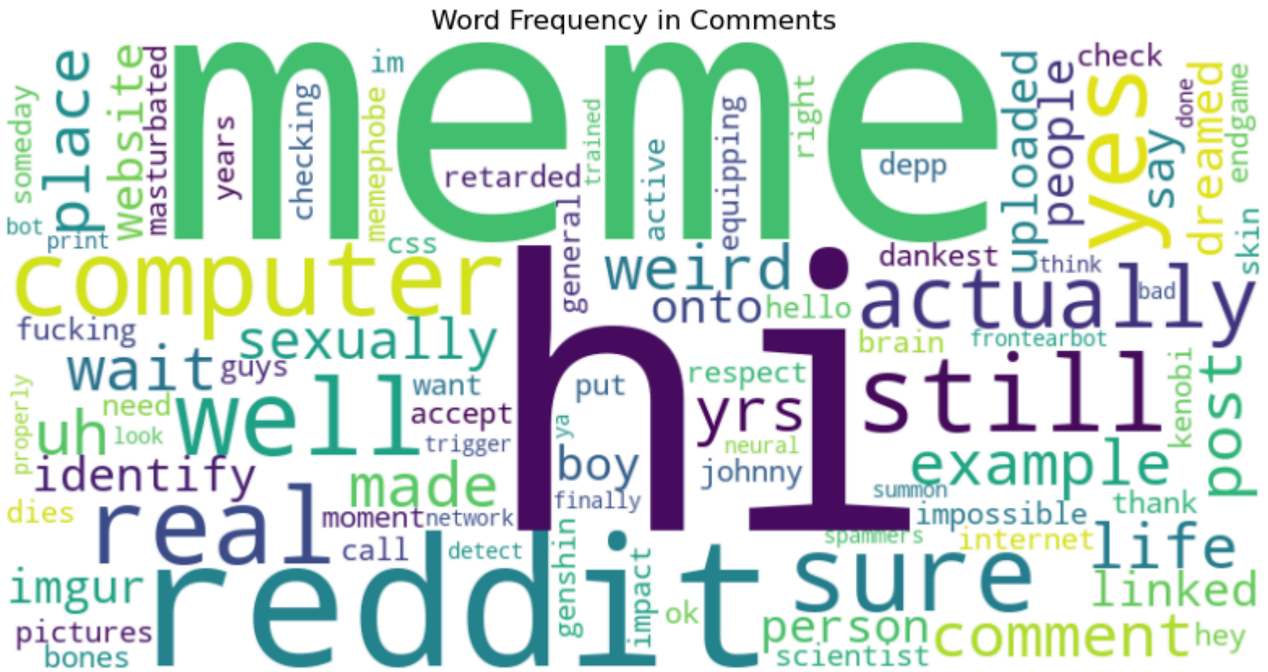


Word Frequency Analysis and Word Clouds

In [15]:
```
# Step 8: Word Frequency Analysis
def preprocess_text(text):
    text = text.lower()
    stop_words = set(stopwords.words('english'))
    words = text.split()
    cleaned_words = [word for word in words if word.isalpha() and word not in stop_words]
    return ' '.join(cleaned_words)

posts_df['Cleaned_Title'] = posts_df['Title'].apply(preprocess_text)
comments_df['Cleaned_Comment'] = comments_df['Comment'].apply(preprocess_text)

all_posts_text = ' '.join(posts_df['Cleaned_Title'])
all_comments_text = ' '.join(comments_df['Cleaned_Comment'])
```

In [16]:
```
# WordCloud for posts
wordcloud_posts = WordCloud(width=800, height=400, background_color='white').generate(all_posts_text)
plt.figure(figsize=(10, 6))
plt.imshow(wordcloud_posts, interpolation='bilinear')
plt.title('Word Frequency in Posts')
plt.axis('off')
plt.show()
```

In [17]:
```
# WordCloud for comments
wordcloud_comments = WordCloud(width=800, height=400, background_color='white').generate(all_comments_text)
plt.figure(figsize=(10, 6))
plt.imshow(wordcloud_comments, interpolation='bilinear')
plt.title('Word Frequency in Comments')
plt.axis('off')
plt.show()
```



Summary

This project performs sentiment analysis on Reddit posts and comments using Python. It includes data collection, sentiment categorization, visualization of sentiment distribution, and word frequency analysis. The added titles help clarify the purpose of each section of the code.

In [ ]: