In [1]:
```
#pip install --upgrade pip
```

In [2]:
```
#pip install vaderSentiment
```

In [3]:
```
#pip install wordcloud
```

In [4]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from colorama import Fore, init
import plotly.express as px

import string
import re
import nltk
from nltk.corpus import stopwords
from nltk.tokenize import word_tokenize
from nltk.stem import PorterStemmer
from nltk.sentiment import SentimentIntensityAnalyzer
from nltk import tokenize
from nltk.tokenize import sent_tokenize
from nltk.tokenize import word_tokenize
from tqdm.notebook import tqdm
from collections import Counter
from wordcloud import WordCloud

nltk.download('vader_lexicon')
nltk.download('punkt')
nltk.download('stopwords')

import warnings
warnings.filterwarnings('ignore')
```

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

In [5]:
```
df = pd.read_csv(r"C:\Users\Kishore\OneDrive\Desktop\Total Machine Learning\CSV Files\sentimentdataset.csv")
df
```

Out[5]:

	Unnamed: 0.1	Unnamed: 0	Text	Sentiment	Timestamp	User	Platform	Hashtags	Retweets
0	0	0	Enjoying a beautiful day at the park! ...	Positive	2023-01-15 12:30:00	User123	Twitter	#Nature #Park	15.0
1	1	1	Traffic was terrible this morning. ...	Negative	2023-01-15 08:45:00	CommuterX	Twitter	#Traffic #Morning	5.0
2	2	2	Just finished an amazing workout! 💪 ...	Positive	2023-01-15 15:45:00	FitnessFan	Instagram	#Fitness #Workout	20.0
3	3	3	Excited about the upcoming weekend getaway! ...	Positive	2023-01-15 18:20:00	AdventureX	Facebook	#Travel #Adventure	8.0
4	4	4	Trying out a new recipe for dinner tonight. ...	Neutral	2023-01-15 19:55:00	ChefCook	Instagram	#Cooking #Food	12.0
...	...	...	...	...	...	...	...	...	...
727	728	732	Collaborating on a science project that receiv...	Happy	2017-08-18 18:20:00	ScienceProjectSuccessHighSchool	Facebook	#ScienceFairWinner #HighSchoolScience	20.0
728	729	733	Attending a surprise birthday party organized ...	Happy	2018-06-22 14:15:00	BirthdayPartyJoyHighSchool	Instagram	#SurpriseCelebration #HighSchoolFriendship	25.0
729	730	734	Successfully fundraising for a school charity ...	Happy	2019-04-05 17:30:00	CharityFundraisingTriumphHighSchool	Twitter	#CommunityGiving #HighSchoolPhilanthropy	22.0
730	731	735	Participating in a multicultural festival, cel...	Happy	2020-02-29 20:45:00	MulticulturalFestivalJoyHighSchool	Facebook	#CulturalCelebration #HighSchoolUnity	21.0

	Unnamed: 0.1	Unnamed: 0	Text	Sentiment	Timestamp	User	Platform	Hashtags	Retweets
731	732	736	Organizing a virtual talent show during challe...	Happy	2020-11-15 15:15:00	VirtualTalentShowSuccessHighSchool	Instagram	#VirtualEntertainment #HighSchoolPositivity	24.0

732 rows × 15 columns

In [6]:
```
def null_count():
    return pd.DataFrame({'features': df.columns,
                 'dtypes': df.dtypes.values})
null_count()
```

Out[6]:

	features	dtypes
0	Unnamed: 0.1	int64
1	Unnamed: 0	int64
2	Text	object
3	Sentiment	object
4	Timestamp	object
5	User	object
6	Platform	object
7	Hashtags	object
8	Retweets	float64
9	Likes	float64
10	Country	object
11	Year	int64
12	Month	int64
13	Day	int64
14	Hour	int64

In [7]:
```
# drop column Unnamed: 0.1
df.drop(columns='Unnamed: 0.1',inplace=True)
```

In [8]:
```
# Rename column Unnamed: 0 to id
df.rename(columns={'Unnamed: 0':'Id'},inplace=True)
```

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

Out[9]:
```
Id           0
Text         0
Sentiment    0
Timestamp    0
User         0
Platform     0
Hashtags     0
Retweets     0
Likes        0
Country      0
Year         0
Month        0
Day          0
Hour         0
dtype: int64
```

In [10]:
```
1 df.dtypes
```

Out[10]:
```
Id             int64
Text          object
Sentiment     object
Timestamp     object
User          object
Platform      object
Hashtags      object
Retweets     float64
Likes        float64
Country       object
Year           int64
Month          int64
Day            int64
Hour           int64
dtype: object
```

In [11]:
```
1 df.duplicated().sum()
```

Out[11]:
```
0
```

In [12]:
```
1 df.columns
```

Out[12]:
```
Index(['Id', 'Text', 'Sentiment', 'Timestamp', 'User', 'Platform', 'Hashtags',
       'Retweets', 'Likes', 'Country', 'Year', 'Month', 'Day', 'Hour'],
      dtype='object')
```

In [13]:
```
for column in df.columns:
    num_distinct_values = len(df[column].unique())
    print(f"{column}: {num_distinct_values} distinct values")
```

```
Id: 732 distinct values
Text: 707 distinct values
Sentiment: 279 distinct values
Timestamp: 683 distinct values
User: 685 distinct values
Platform: 4 distinct values
Hashtags: 697 distinct values
Retweets: 26 distinct values
Likes: 38 distinct values
Country: 115 distinct values
Year: 14 distinct values
Month: 12 distinct values
Day: 31 distinct values
Hour: 22 distinct values
```

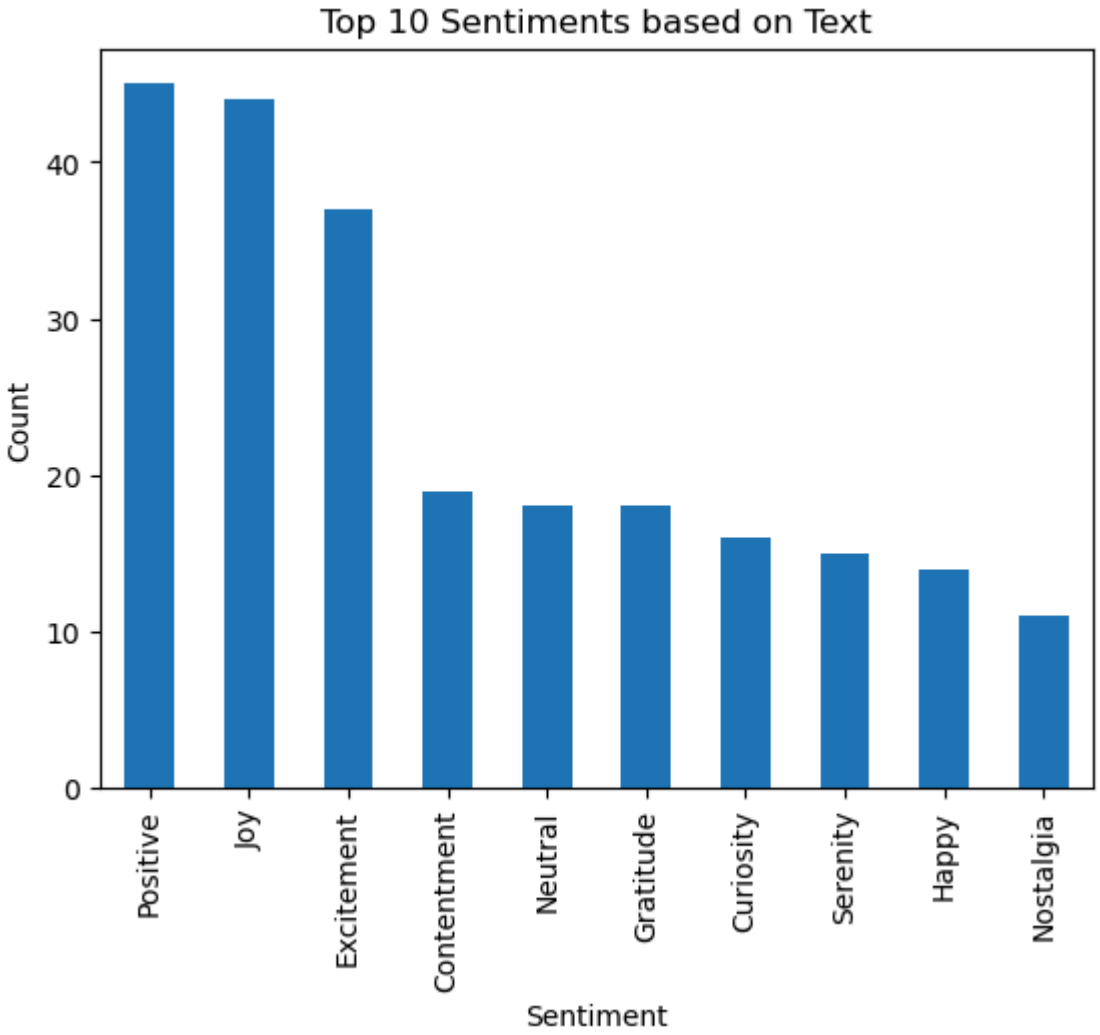
In [14]:
```
## drop Columns
```

In [15]:
```
##df = df.drop(columns=['Id', 'Hashtags','Day', 'Hour','Sentiment'])
```

In [16]:
```
df['Timestamp'] = pd.to_datetime(df['Timestamp'])
df['Day'] = df['Timestamp'].dt.day
df['Month'] = df['Timestamp'].dt.month
df['Year'] = df['Timestamp'].dt.year
df['Day_of_Week'] = df['Timestamp'].dt.day_name()
```

In [17]:
```
df['Text']= df['Text'].str.strip()
df['Sentiment']= df['Sentiment'].str.strip()
df['User']= df['User'].str.strip()
df['Platform']= df['Platform'].str.strip()
df['Hashtags']= df['Hashtags'].str.strip()
df['Country']= df['Country'].str.strip()
```

In [18]:
```
df['Sentiment'].value_counts().nlargest(10).plot(kind='bar')
plt.title('Top 10 Sentiments based on Text')
plt.xlabel('Sentiment')
plt.ylabel('Count')
plt.show()
```



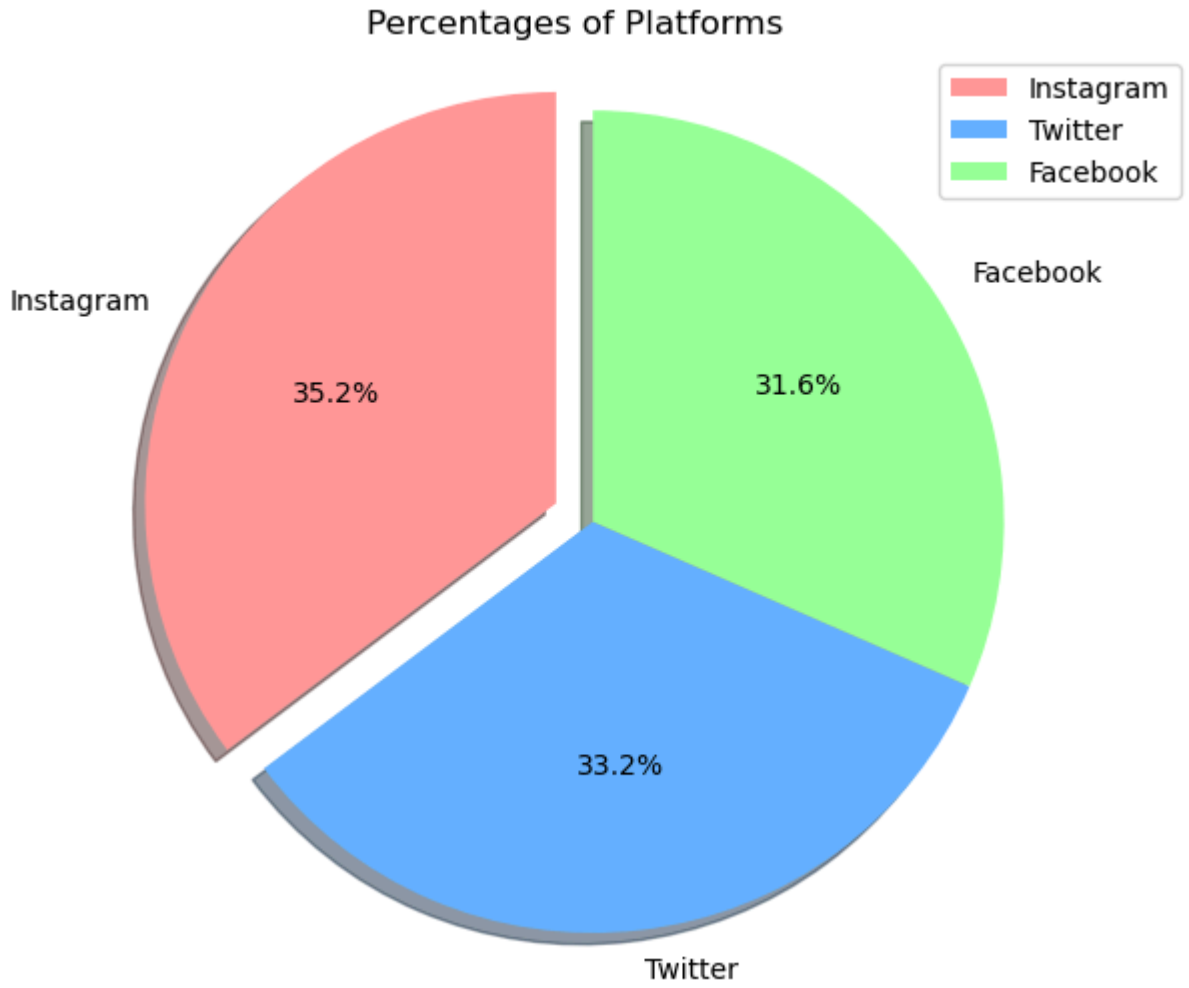
In [19]:
```
1 df['Platform'].value_counts()
```

Out[19]:
```
Instagram    258
Twitter      243
Facebook     231
Name: Platform, dtype: int64
```

In [20]:
```
1 #df['Platform'].value_counts().plot(kind='pie', autopct='%1.1f%%')
2 #plt.title('Percentages of Platforms')
3 #plt.legend()
4 #plt.show()
```

In [21]:

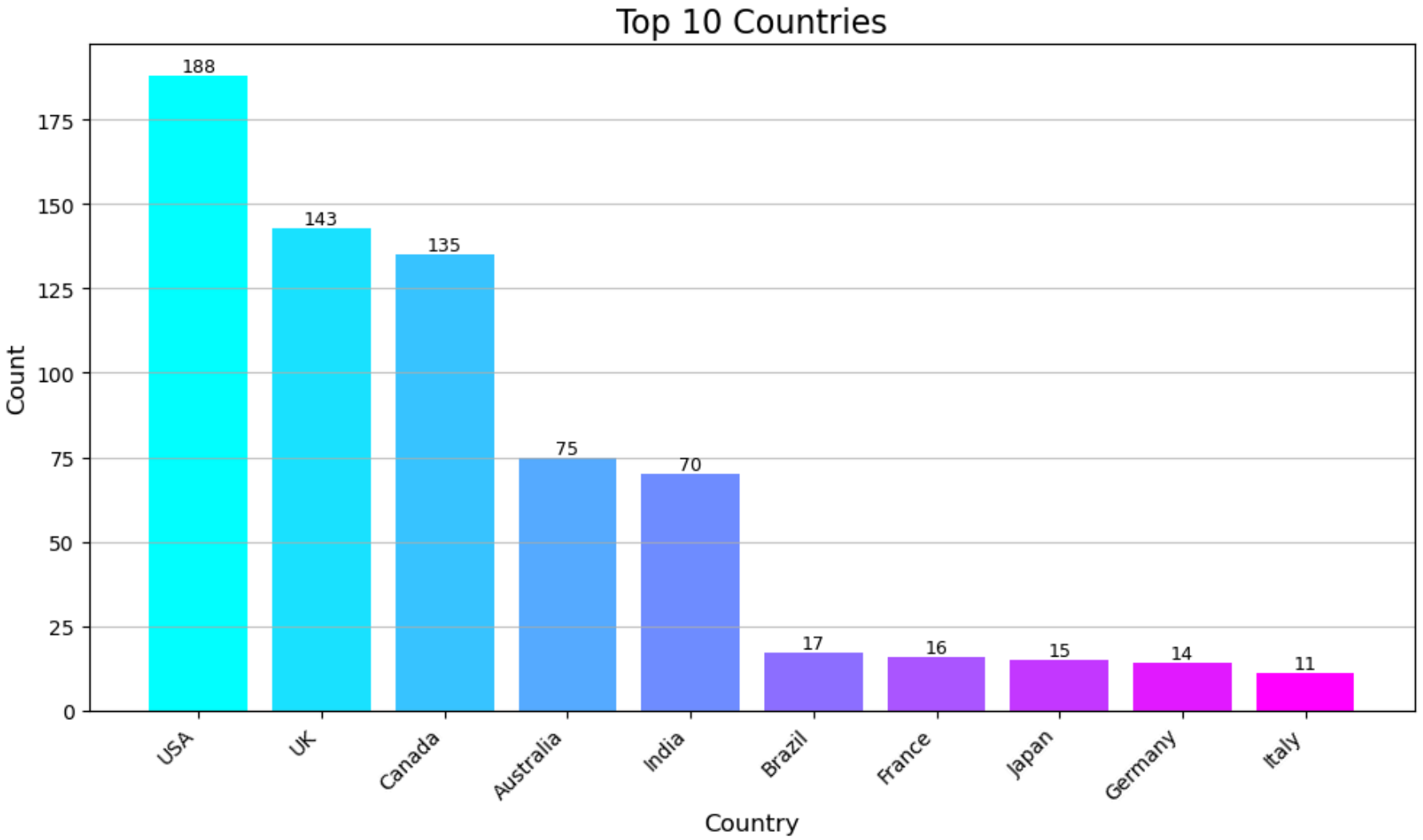
```
# Get the value counts of 'Platform' column
platform_counts = df['Platform'].value_counts()

# Define colors for the pie chart
colors = ['#ff9999', '#66b3ff', '#99ff99', '#ffcc99']

# Define explode to highlight the first platform
explode = [0.1 if i == 0 else 0 for i in range(len(platform_counts))]

# Create the pie chart
plt.figure(figsize=(8, 6))
plt.pie(platform_counts, labels=platform_counts.index, autopct='%1.1f%%', colors=colors, startangle=90, shadow=Tr

# Equal aspect ratio ensures that pie is drawn as a circle
plt.axis('equal')
plt.title('Percentages of Platforms')
plt.legend(platform_counts.index, loc="best")
plt.show()

```



In [22]:
```
#df['Country'].value_counts().nlargest(10).plot(kind='bar')
#plt.title('Top 10 Country')
#plt.legend()
#plt.show()
```

In [23]:

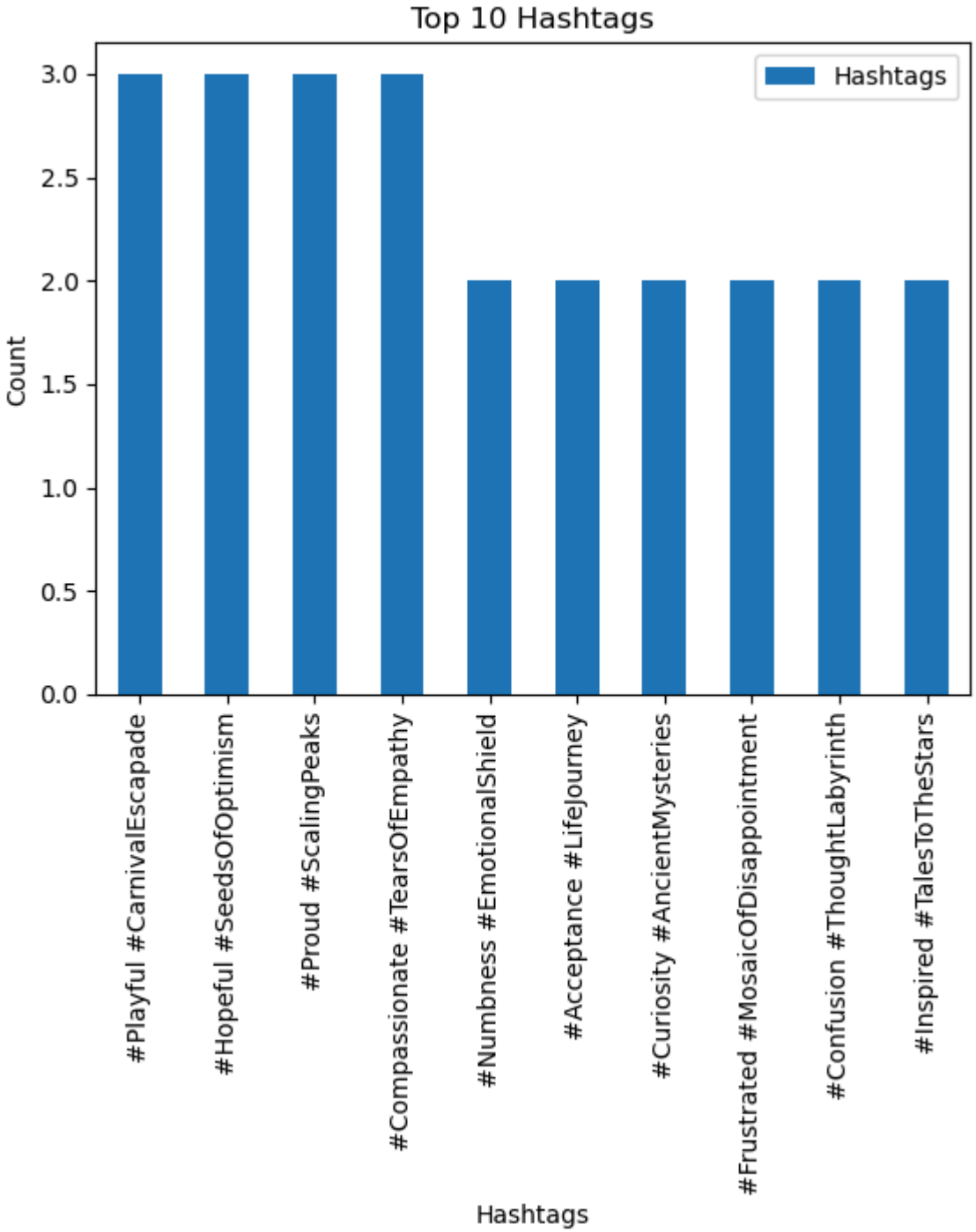
```
# Get the top 10 countries by value counts
top_countries = df['Country'].value_counts().nlargest(10)

# Define colors for the bar chart
colors = ['#1f77b4', '#ff7f0e', '#2ca02c', '#d62728', '#9467bd', '#8c564b', '#e377c2', '#7f7f7f', '#bcbd22', '#17

# Create a color gradient
gradient = np.linspace(0, 1, len(top_countries))
colors = plt.cm.cool(gradient)

# Create the bar chart with enhanced aesthetics
plt.figure(figsize=(10, 6))
bars = plt.bar(top_countries.index, top_countries.values, color=colors)

# Add title and labels
plt.title('Top 10 Countries', fontsize=16)
plt.xlabel('Country', fontsize=12)
plt.ylabel('Count', fontsize=12)

# Customize ticks and grid lines
plt.xticks(rotation=45, ha='right', fontsize=10)
plt.yticks(fontsize=10)
plt.grid(axis='y', linestyle='-', alpha=0.7)

# Add data labels
for bar in bars:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(),
             round(bar.get_height(), 2), ha='center', va='bottom', fontsize=9)

# Show the plot
plt.tight_layout()
plt.show()

```


Top 10 Countries
Count
Country
188
143
135
75
70
17
16
15
14
11
0
25
50
75
100
125
150
175
USA
UK
Canada
Australia
India
Brazil
France
Japan
Germany
Italy

In [ ]:
```
1
```

In [24]:

```
df['Hashtags'].value_counts().nlargest(10).plot(kind='bar')
plt.title('Top 10 Hashtags')
plt.xlabel('Hashtags')
plt.ylabel('Count')
plt.legend()
plt.show()
```


Top 10 Hashtags
Hashtags
Count
3.0
2.5
2.0
1.5
1.0
0.5
0.0
#Playful #CarnivalEscapade
#Hopeful #SeedsOfOptimism
#Proud #ScalingPeaks
#Compassionate #TearsOfEmpathy
#Numbness #EmotionalShield
#Acceptance #Lifejourney
#Curiosity #AncientMysteries
#Frustrated #MosaicOfDisappointment
#Confusion #ThoughtLabyrinth
#Inspired #TalesToTheStars
Hashtags

In [25]:
```
# Describe data numerical
df.describe()
```

Out[25]:

	Id	Retweets	Likes	Year	Month	Day	Hour
count	732.000000	732.000000	732.000000	732.000000	732.000000	732.000000	732.000000
mean	369.740437	21.508197	42.901639	2020.471311	6.122951	15.497268	15.521858
std	212.428936	7.061286	14.089848	2.802285	3.411763	8.474553	4.113414
min	0.000000	5.000000	10.000000	2010.000000	1.000000	1.000000	0.000000
25%	185.750000	17.750000	34.750000	2019.000000	3.000000	9.000000	13.000000
50%	370.500000	22.000000	43.000000	2021.000000	6.000000	15.000000	16.000000
75%	553.250000	25.000000	50.000000	2023.000000	9.000000	22.000000	19.000000
max	736.000000	40.000000	80.000000	2023.000000	12.000000	31.000000	23.000000

In [26]:
```
numerical_columns = df[['Day', 'Month', 'Year', 'Likes', 'Retweets']]

for col in numerical_columns.columns:
    print(f"Minimum {col}: {df[col].min()} | Maximum {col}: {df[col].max()}")
```

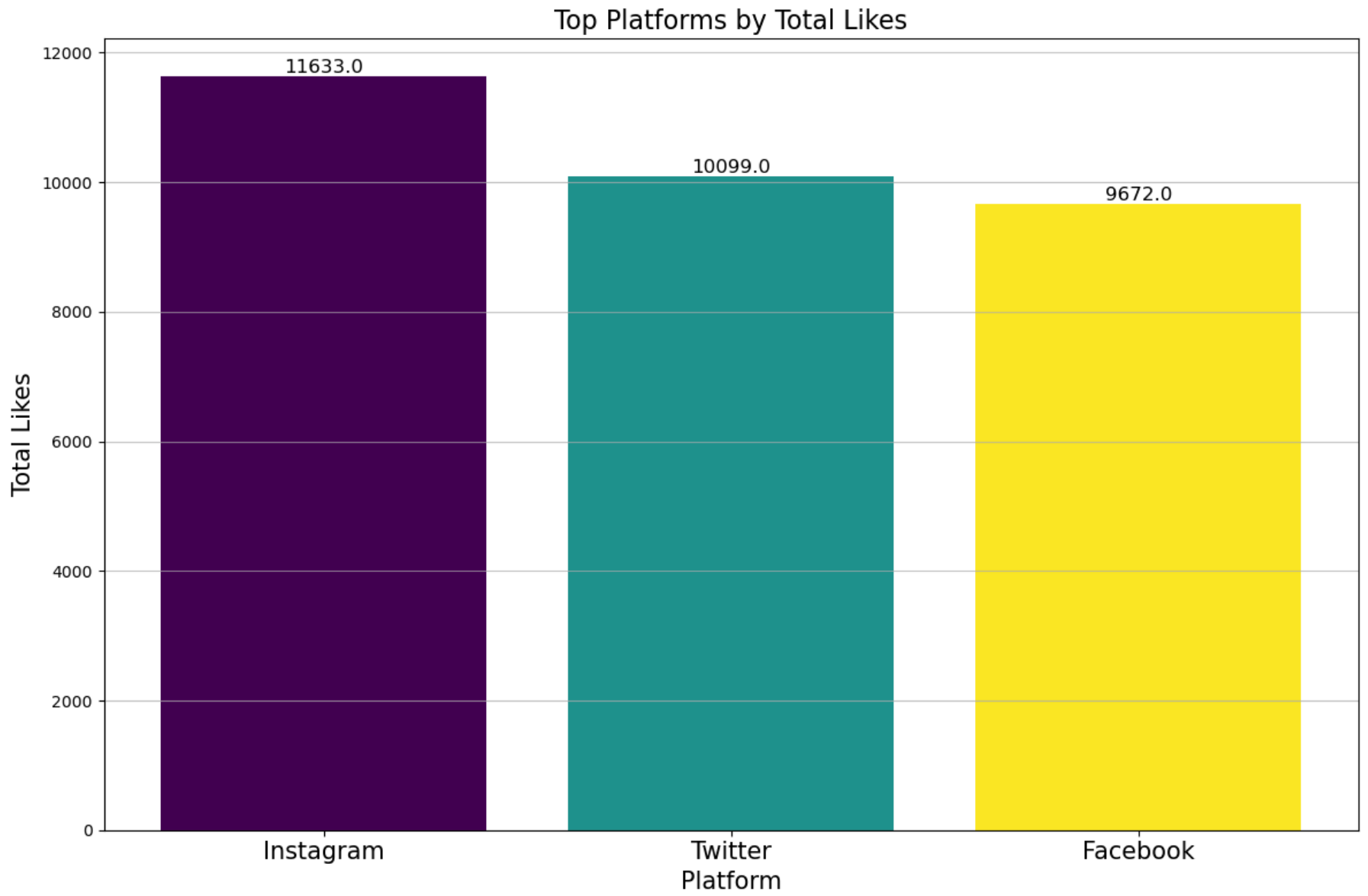
```
Minimum Day: 1 | Maximum Day: 31
Minimum Month: 1 | Maximum Month: 12
Minimum Year: 2010 | Maximum Year: 2023
Minimum Likes: 10.0 | Maximum Likes: 80.0
Minimum Retweets: 5.0 | Maximum Retweets: 40.0
```

Platform Top liked by Users ?

In [27]:
```
#top_likes_platform = df.groupby('Platform')['Likes'].sum().nlargest(10)
#top_likes_platform.plot(kind='bar')
#plt.title('Top Platforms by Total Likes')
#plt.xlabel('Platform')
#plt.ylabel('Total Likes')
#plt.show()
```

In [28]:

```
# Group by 'Platform' and calculate the sum of 'Likes', then select the top 10 platforms
top_likes_platform = df.groupby('Platform')['Likes'].sum().nlargest(10)

# Create a color gradient
colors = plt.cm.viridis(np.linspace(0, 1, len(top_likes_platform)))

# Create the bar chart with enhanced aesthetics
plt.figure(figsize=(12, 8))
bars = plt.bar(top_likes_platform.index, top_likes_platform.values, color=colors)

# Add title and labels
plt.title('Top Platforms by Total Likes', fontsize=16)
plt.xlabel('Platform', fontsize=15)
plt.ylabel('Total Likes', fontsize=15)

# Customize ticks and grid lines
plt.xticks(rotation=0, fontsize=15)
plt.yticks(fontsize=10)
plt.grid(axis='y', linestyle='-', alpha=0.7)

# Add data labels
for bar in bars:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(),
             round(bar.get_height(), 2), ha='center', va='bottom', fontsize=12)

# Show the plot
plt.tight_layout()
plt.show()

```


Top Platforms by Total Likes
Total Likes
12000
10000
8000
6000
4000
2000
0
11633.0
10099.0
9672.0
Instagram
Twitter
Facebook
Platform

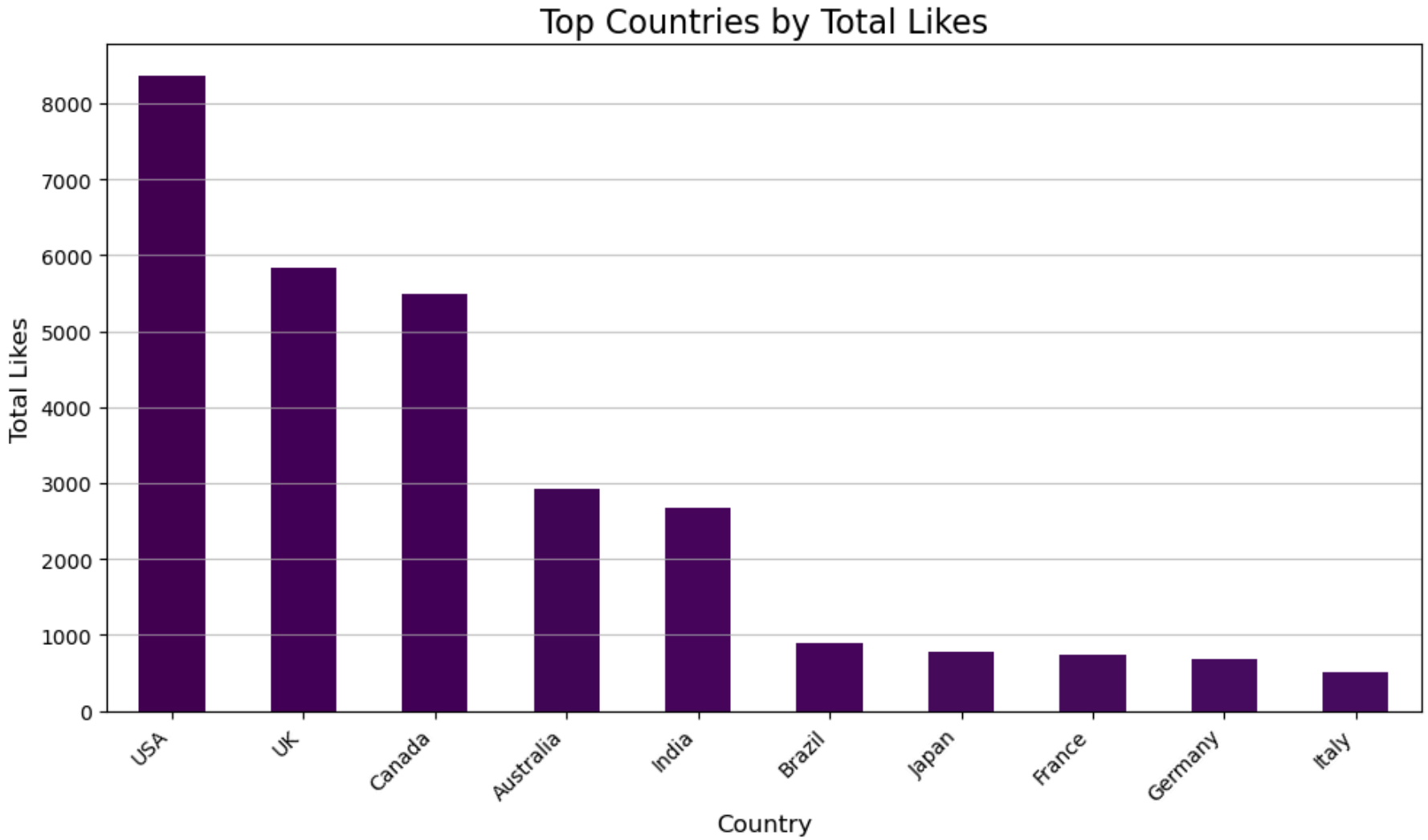
Most Country Liked posts

In [29]:

```
#top_country_likes=df.groupby('Country')['Likes'].sum().nlargest(10)
#top_country_likes.plot(kind='bar')
#plt.title('Top country likes')
#plt.xlabel('Country')
#plt.ylabel('count')
#plt.show()
```

In [30]:

```
import matplotlib.pyplot as plt

# Group by 'Country' and calculate the sum of 'Likes', then select the top 10 countries
top_country_likes = df.groupby('Country')['Likes'].sum().nlargest(10)

# Selecting colors from the 'viridis' colormap
colors = plt.cm.viridis(range(len(top_country_likes)))

# Create the bar chart with enhanced aesthetics
plt.figure(figsize=(10, 6))
top_country_likes.plot(kind='bar', color=colors)

# Add title and labels
plt.title('Top Countries by Total Likes', fontsize=16)
plt.xlabel('Country', fontsize=12)
plt.ylabel('Total Likes', fontsize=12)

# Customize ticks and grid lines
plt.xticks(rotation=45, ha='right', fontsize=10)
plt.yticks(fontsize=10)
plt.grid(axis='y', linestyle='-', alpha=0.7)

# Show the plot
plt.tight_layout()
plt.show()

```


Top Countries by Total Likes
Total Likes
0
1000
2000
3000
4000
5000
6000
7000
8000
USA
UK
Canada
Australia
India
Brazil
Japan
France
Germany
Italy
Country

Segmenting users for each platform

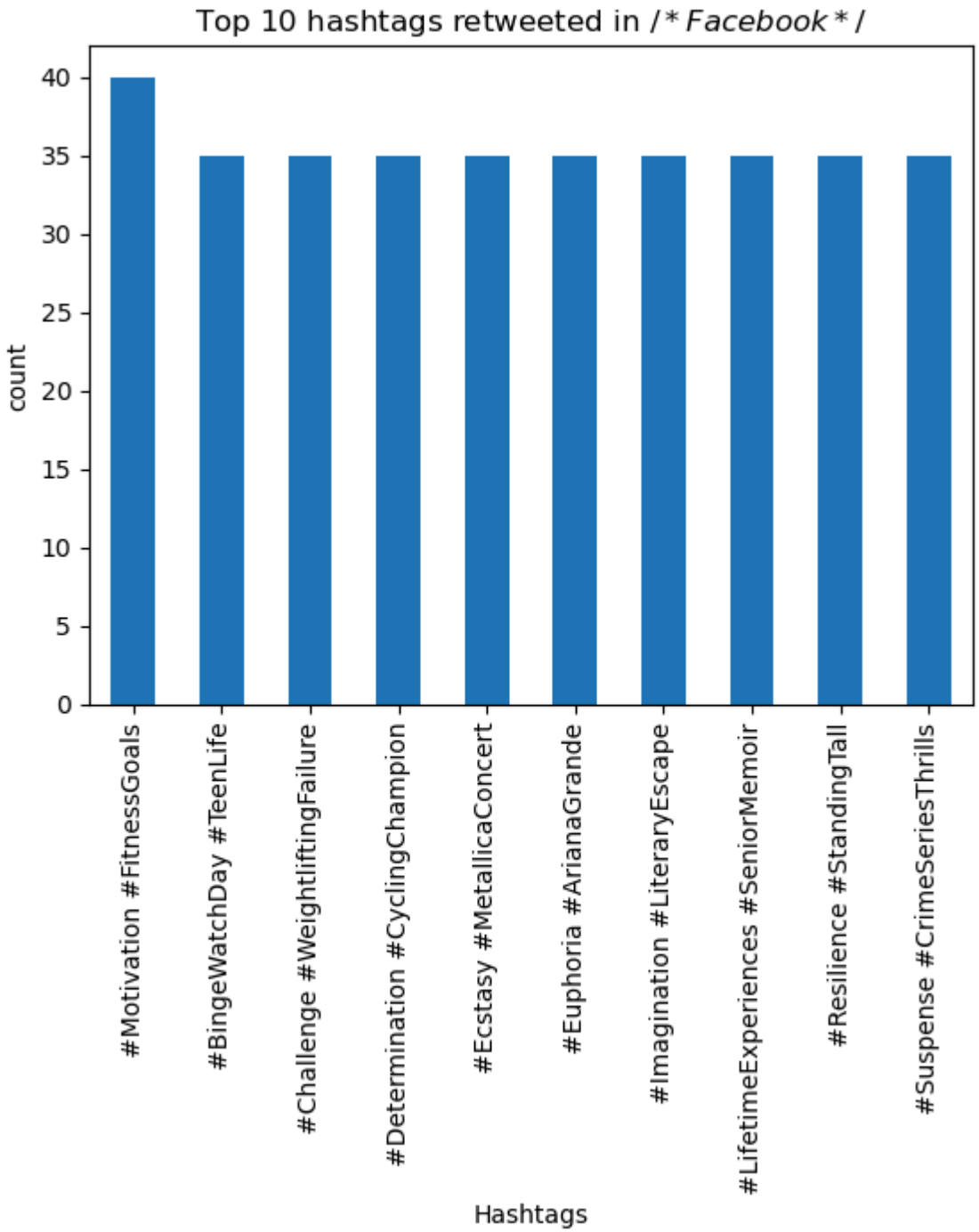
In [31]:

```
Facebook=df[df['Platform']=='Facebook']
Twitter=df[df['Platform']=='Twitter']
Instagram=df[df['Platform']=='Instagram']
```

Facebook

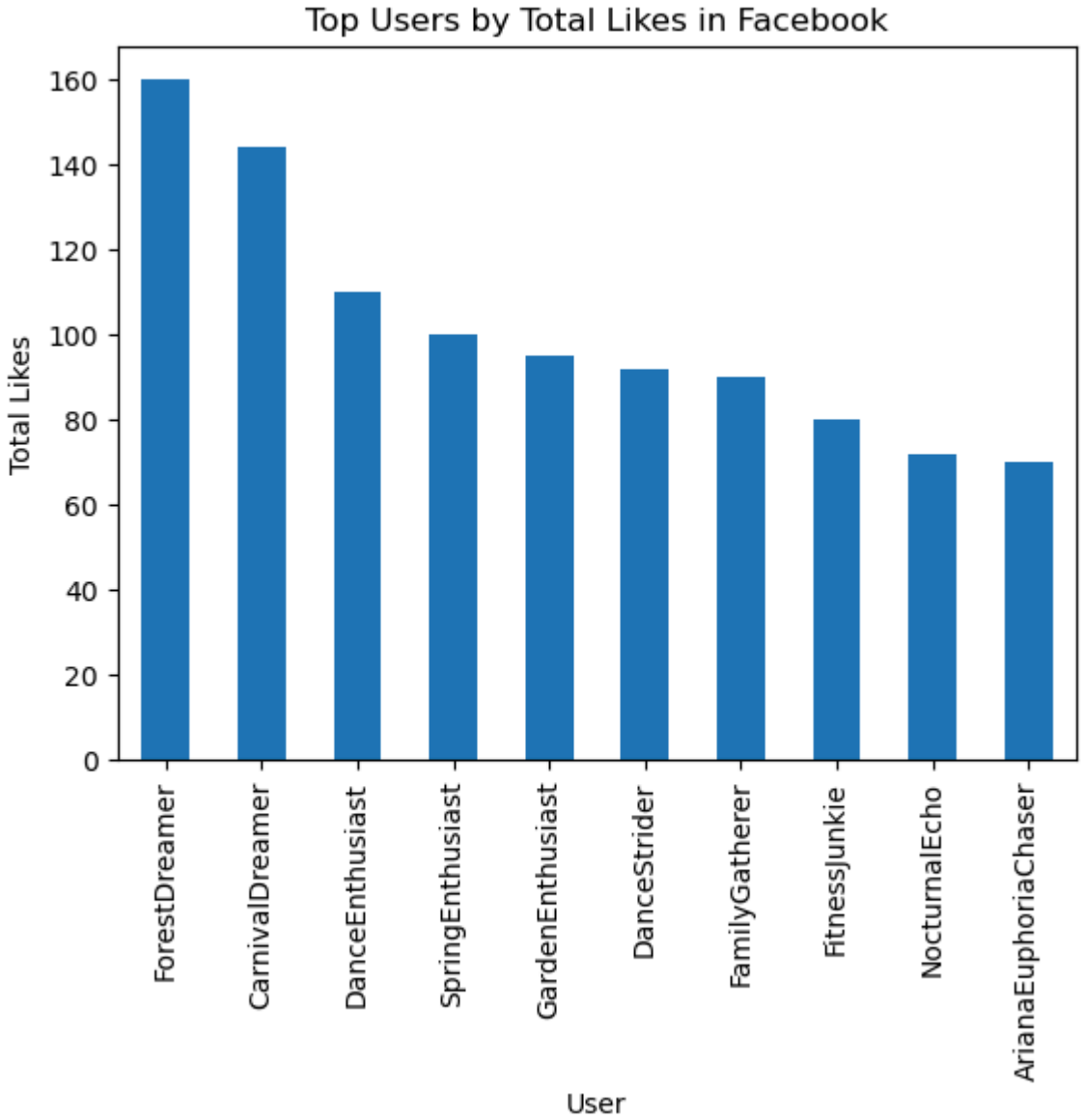
Top 10 hashtags retweeted

In [32]:
```
H_R_f=Facebook.groupby('Hashtags')['Retweets'].max().nlargest(10).sort_values(ascending=False)
H_R_f.plot(kind='bar')
plt.title('Top 10 hashtags retweeted in $/*Facebook*$/')
plt.xlabel('Hashtags')
plt.ylabel('count')
plt.show()
```


Top 10 hashtags retweeted in /* Facebook */
count
0
5
10
15
20
25
30
35
40
#Motivation #FitnessGoals
#BingeWatchDay #TeenLife
#Challenge #WeightliftingFailure
#Determination #CyclingChampion
#Ecstasy #MetallicaConcert
#Euphoria #ArianaGrande
#Imagination #LiteraryEscape
#LifetimeExperiences #SeniorMemoir
#Resilience #StandingTall
#Suspense #CrimeSeriesThrills
Hashtags

Which User liked mostly

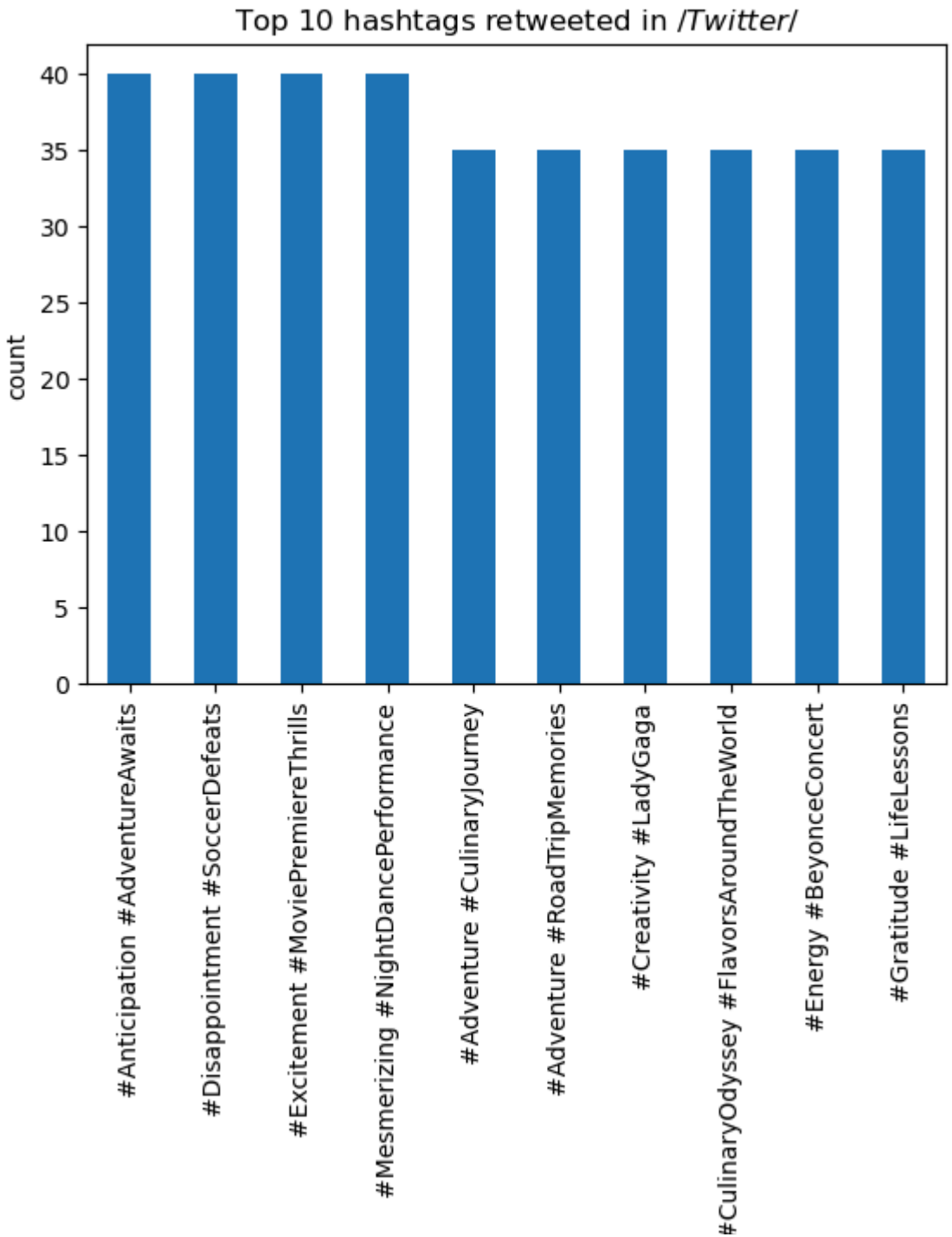
In [33]:
```
top_likes_platform_F = Facebook.groupby('User')['Likes'].sum().nlargest(10)
top_likes_platform_F.plot(kind='bar')
plt.title('Top Users by Total Likes in Facebook')
plt.xlabel('User')
plt.ylabel('Total Likes')
plt.show()
```


Top Users by Total Likes in Facebook
Total Likes
0
20
40
60
80
100
120
140
160
ForestDreamer
CarnivalDreamer
DanceEnthusiast
SpringEnthusiast
GardenEnthusiast
DanceStrider
FamilyGatherer
FitnessJunkie
NocturnalEcho
ArianaEuphoriaChaser
User

Twitter

Top 10 hashtags retweeted

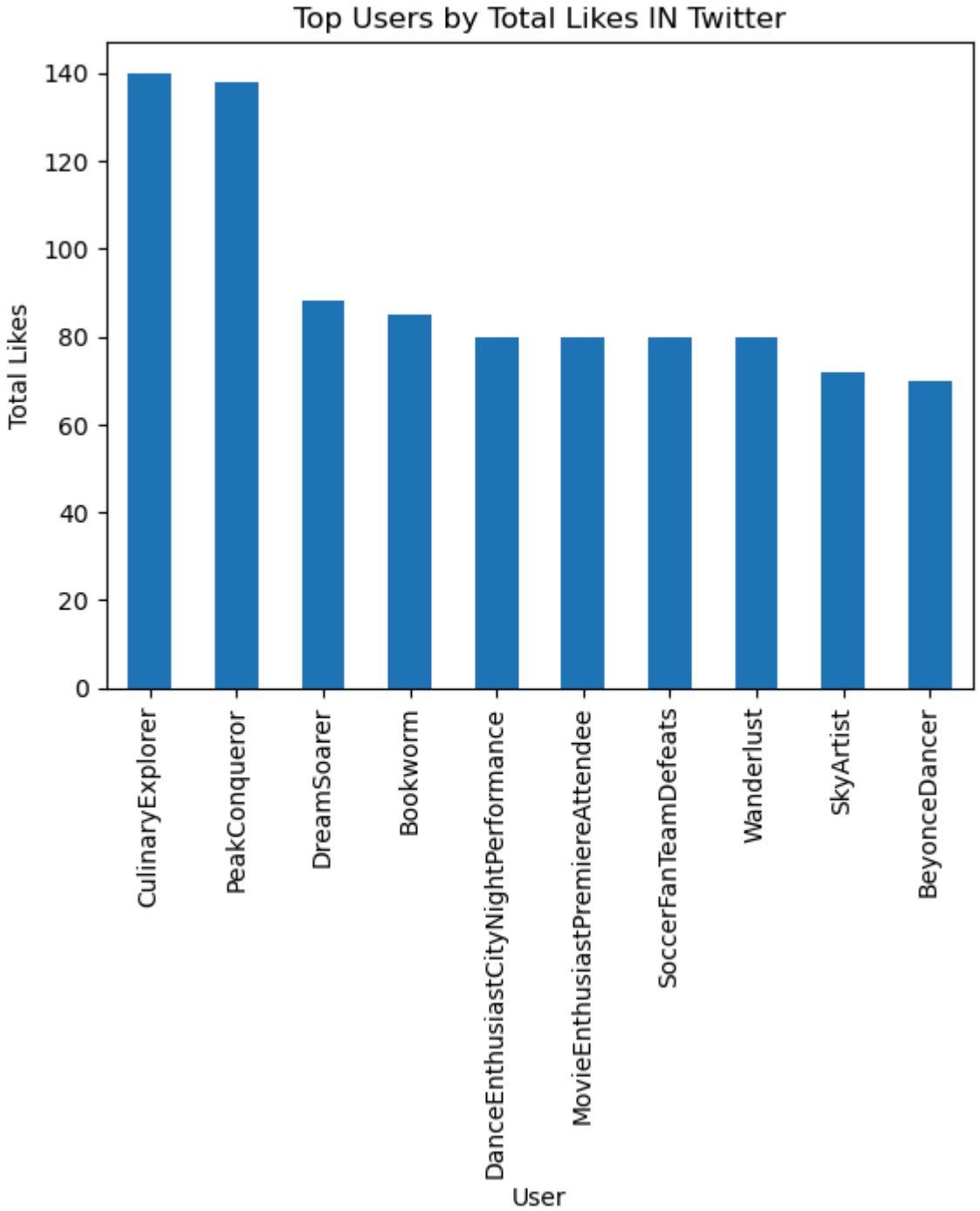
In [34]:
```
H_R_t=Twitter.groupby('Hashtags')['Retweets'].max().nlargest(10).sort_values(ascending=False)
H_R_t.plot(kind='bar')
plt.title('Top 10 hashtags retweeted in $/ Twitter $/')
plt.xlabel('Hashtags')
plt.ylabel('count')
plt.show()
```


Top 10 hashtags retweeted in /Twitter/
count
0
5
10
15
20
25
30
35
40
#Anticipation #AdventureAwaits
#Disappointment #SoccerDefeats
#Excitement #MoviePremiereThrills
#Mesmerizing #NightDancePerformance
#Adventure #CulinaryJourney
#Adventure #RoadTripMemories
#Creativity #LadyGaga
#CulinaryOdyssey #FlavorsAroundTheWorld
#Energy #BeyonceConcert
#Gratitude #LifeLessons


Hashtags

Who User liked mostly

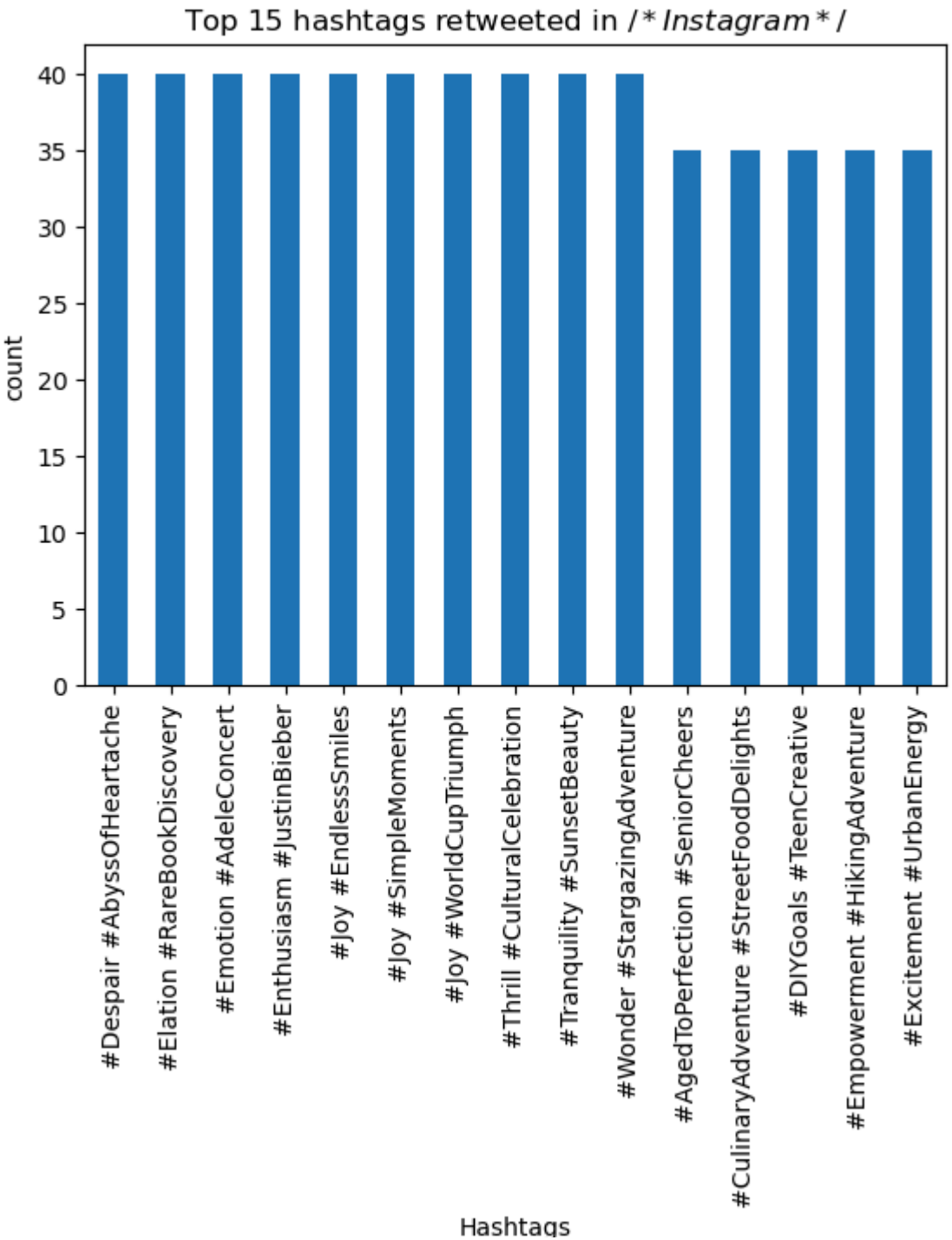
In [35]:
```
top_likes_platform_t = Twitter.groupby('User')['Likes'].sum().nlargest(10)
top_likes_platform_t.plot(kind='bar')
plt.title('Top Users by Total Likes IN Twitter')
plt.xlabel('User')
plt.ylabel('Total Likes')
plt.show()
```


Top Users by Total Likes IN Twitter
Total Likes
0
20
40
60
80
100
120
140
CulinaryExplorer
PeakConqueror
DreamSoarer
Bookworm
DanceEnthusiastCityNightPerformance
MovieEnthusiastPremiereAttendee
SoccerFanTeamDefeats
Wanderlust
SkyArtist
BeyonceDancer
User

Instagram

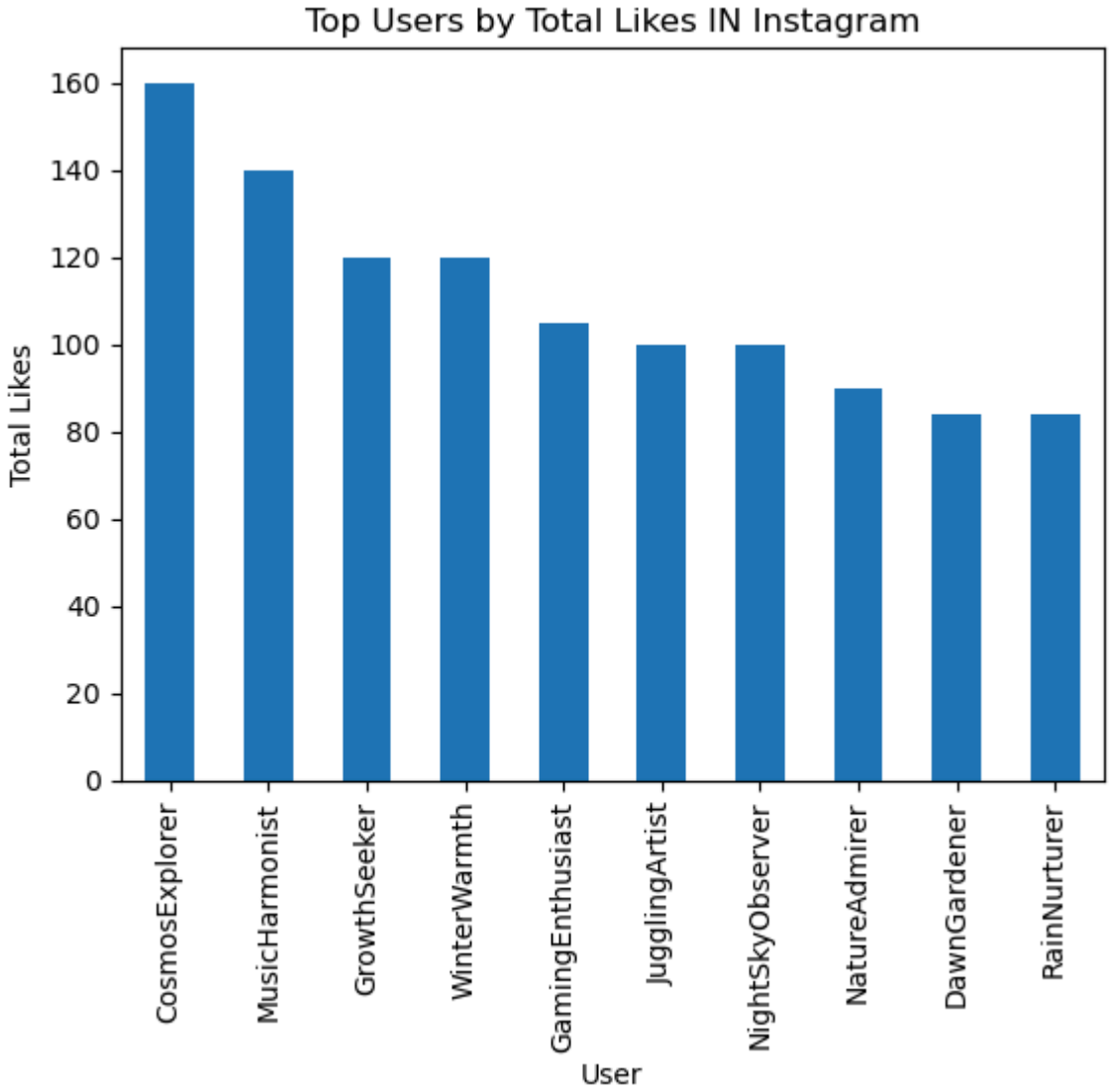
Top 10 hashtags retweeted

In [36]:
```
H_R_i=Instagram.groupby('Hashtags')['Retweets'].max().nlargest(15).sort_values(ascending=False)
H_R_i.plot(kind='bar')
plt.title('Top 15 hashtags retweeted in $/ *Instagram* $/')
plt.xlabel('Hashtags')
plt.ylabel('count')
plt.show()
```


Top 15 hashtags retweeted in /* Instagram */
count
0
5
10
15
20
25
30
35
40
#Despair #AbyssOfHeartache
#Elation #RareBookDiscovery
#Emotion #AdeleConcert
#Enthusiasm #JustinBieber
#Joy #EndlessSmiles
#Joy #SimpleMoments
#Joy #WorldCupTriumph
#Thrill #CulturalCelebration
#Tranquility #SunsetBeauty
#Wonder #StargazingAdventure
#AgedToPerfection #SeniorCheers
#CulinaryAdventure #StreetFoodDelights
#DIYGoals #TeenCreative
#Empowerment #HikingAdventure
#Excitement #UrbanEnergy
Hashtags

Which User liked mostly

In [37]:
```
top_likes_platform_i = Instagram.groupby('User')['Likes'].sum().nlargest(10)
top_likes_platform_i.plot(kind='bar')
plt.title('Top Users by Total Likes IN Instagram')
plt.xlabel('User')
plt.ylabel('Total Likes')
plt.show()
```


Top Users by Total Likes IN Instagram
Total Likes
0
20
40
60
80
100
120
140
160
CosmosExplorer
MusicHarmonist
GrowthSeeker
WinterWarmth
GamingEnthusiast
JugglingArtist
NightSkyObserver
NatureAdmirer
DawnGardener
RainNurturer
User

Month

In [38]:

```
month_mapping = {
    1: 'January',
    2: 'February',
    3: 'March',
    4: 'April',
    5: 'May',
    6: 'June',
    7: 'July',
    8: 'August',
    9: 'September',
    10: 'October',
    11: 'November',
    12: 'December'
}

df['Month'] = df['Month'].map(month_mapping)

df['Month'] = df['Month'].astype('object')
```

Text

In [39]:
```
stemmer = PorterStemmer()
stop_words = set(stopwords.words('english'))

def clean(text):
    text = str(text).lower()
    text = re.sub('\[.*?\]', '', text)
    text = re.sub('https?://\S+|www\.\S+', '', text)
    text = re.sub(r'\s+', ' ', text.strip())
    text = re.sub('<.*?>+', '', text)
    text = re.sub('[%s]' % re.escape(string.punctuation), '', text)
    text = re.sub('\n', '', text)
    text = re.sub('\w*\d\w*', '', text)
    text = re.sub(r'[^\x00-\x7F]+', '', text)
    text = " ".join(text.split())
    tokens = word_tokenize(text)

    cleaned_tokens = [stemmer.stem(token) for token in tokens if token.lower() not in stop_words]

    cleaned_text = ' '.join(cleaned_tokens)

    return cleaned_text

df["Clean_Text"] = df["Text"].apply(clean)
```

Sentiment Analysis

In [40]:
```
df1 = df.copy()
```

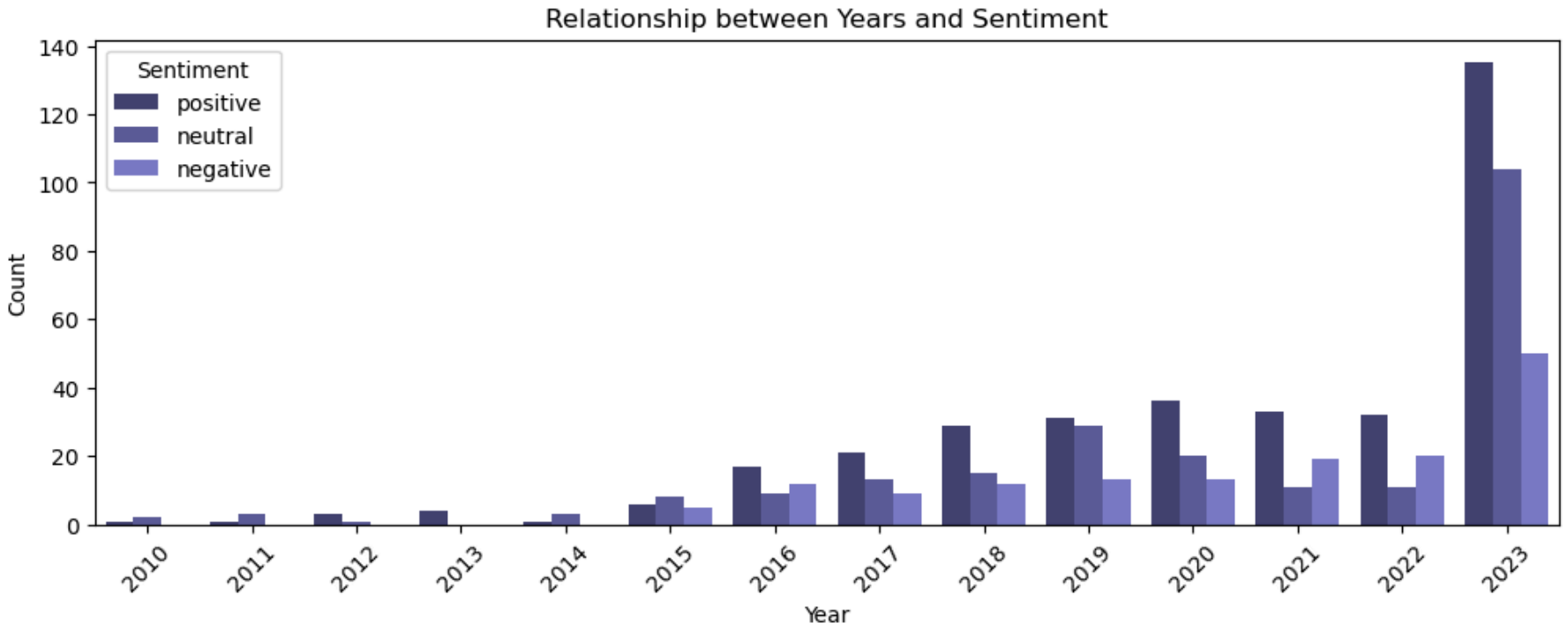
In [41]:
```
analyzer = SentimentIntensityAnalyzer()

df1['Vader_Score'] = df1['Clean_Text'].apply(lambda text: analyzer.polarity_scores(text)['compound'])

df1['Sentiment'] = df1['Vader_Score'].apply(lambda score: 'positive' if score >= 0.05 else ('negative' if score <

print(df1[['Clean_Text', 'Vader_Score', 'Sentiment']].head())
```

```
                   Clean_Text  Vader_Score Sentiment
0         enjoy beauti day park       0.4939  positive
1          traffic terribl morn       0.0000   neutral
2           finish amaz workout       0.0000   neutral
3   excit upcom weekend getaway       0.0000   neutral
4  tri new recip dinner tonight       0.0000   neutral
```

Relationship B/w Years & Sentiments

In [42]:
```
#df['Year'] = df['Timestamp'].dt.year
```

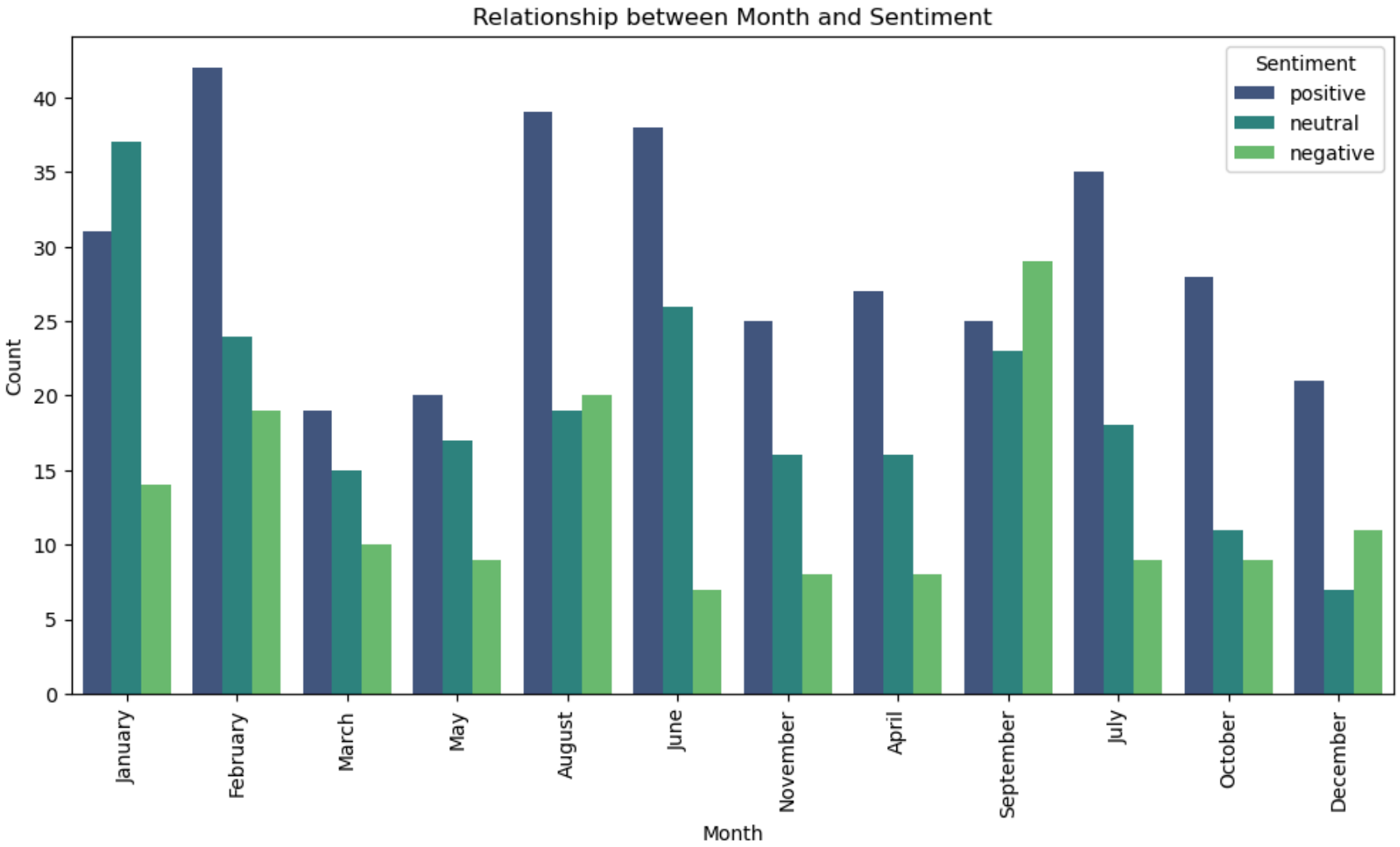
In [43]:
```
plt.figure(figsize=(12, 4))
sns.countplot(x='Year', hue='Sentiment', data=df1, palette='tab20b')
plt.title('Relationship between Years and Sentiment')
plt.xlabel('Year')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.show()
```



Relationship B/w Months & Sentiments

In [44]:
```
#df['Month'] = df['Timestamp'].dt.month
```

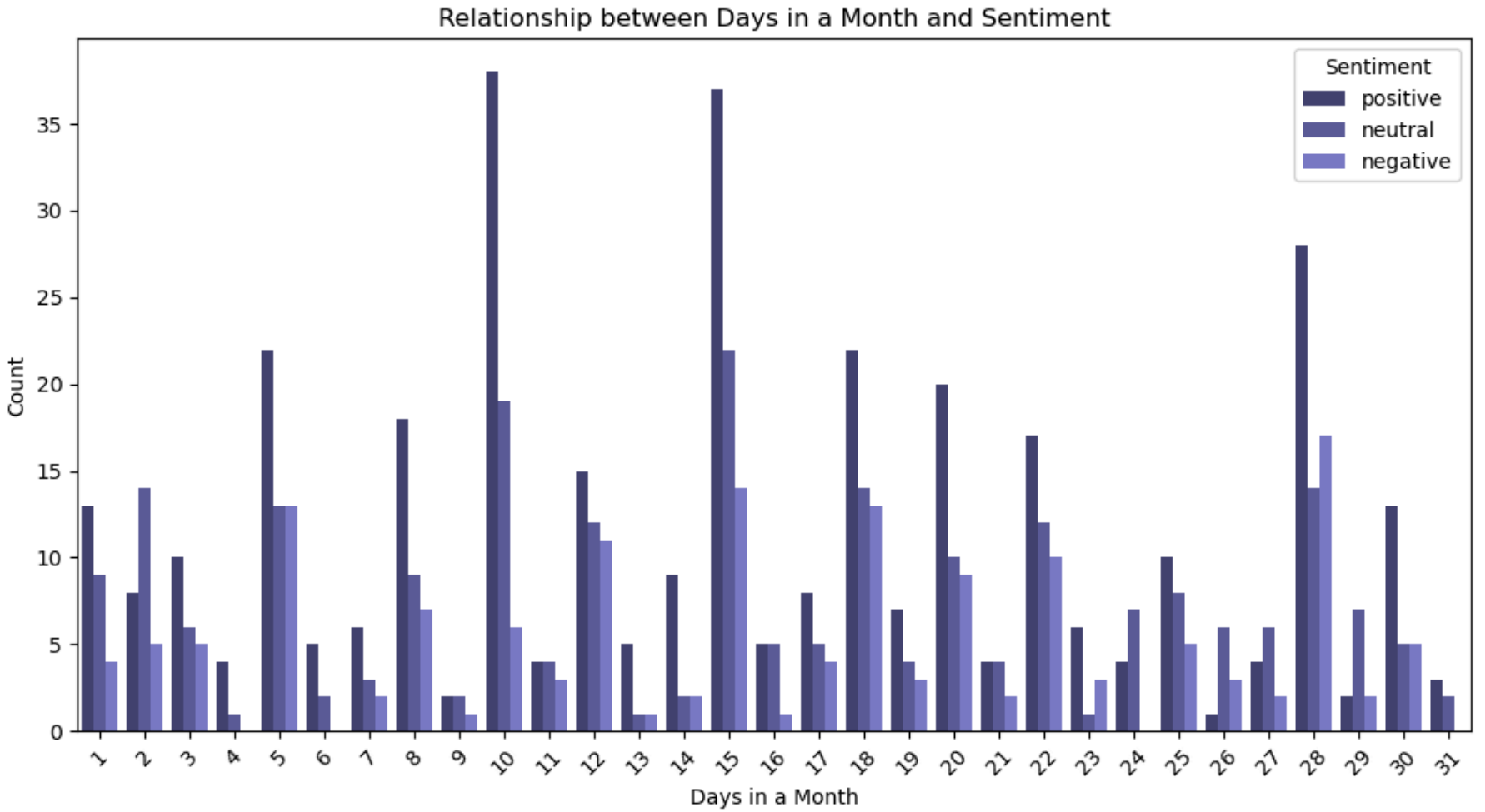
In [45]:
```
plt.figure(figsize=(12, 6))
sns.countplot(x='Month', hue='Sentiment', data=df1, palette='viridis')
plt.title('Relationship between Month and Sentiment')
plt.xlabel('Month')
plt.ylabel('Count')
plt.xticks(rotation=90)
plt.show()
```



Relationship B/w Days & Sentiments

In [46]:
```
#df['Day'] = df['Timestamp'].dt.day
```

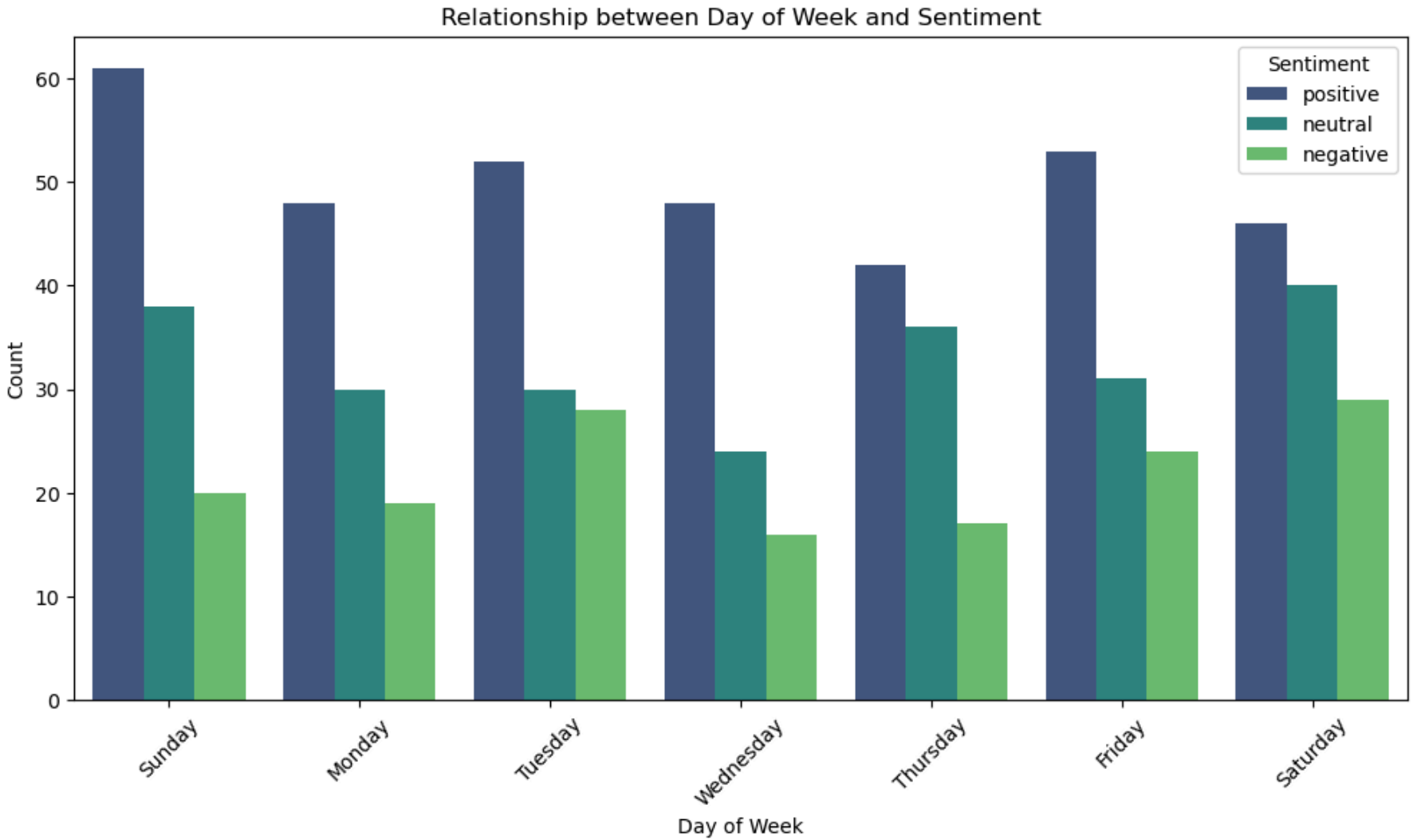
In [47]:
```
plt.figure(figsize=(12, 6))
sns.countplot(x='Day', hue='Sentiment', data=df1, palette='tab20b')
plt.title('Relationship between Days in a Month and Sentiment')
plt.xlabel('Days in a Month')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.show()
```



Relationship B/w Day of Week & Sentiments

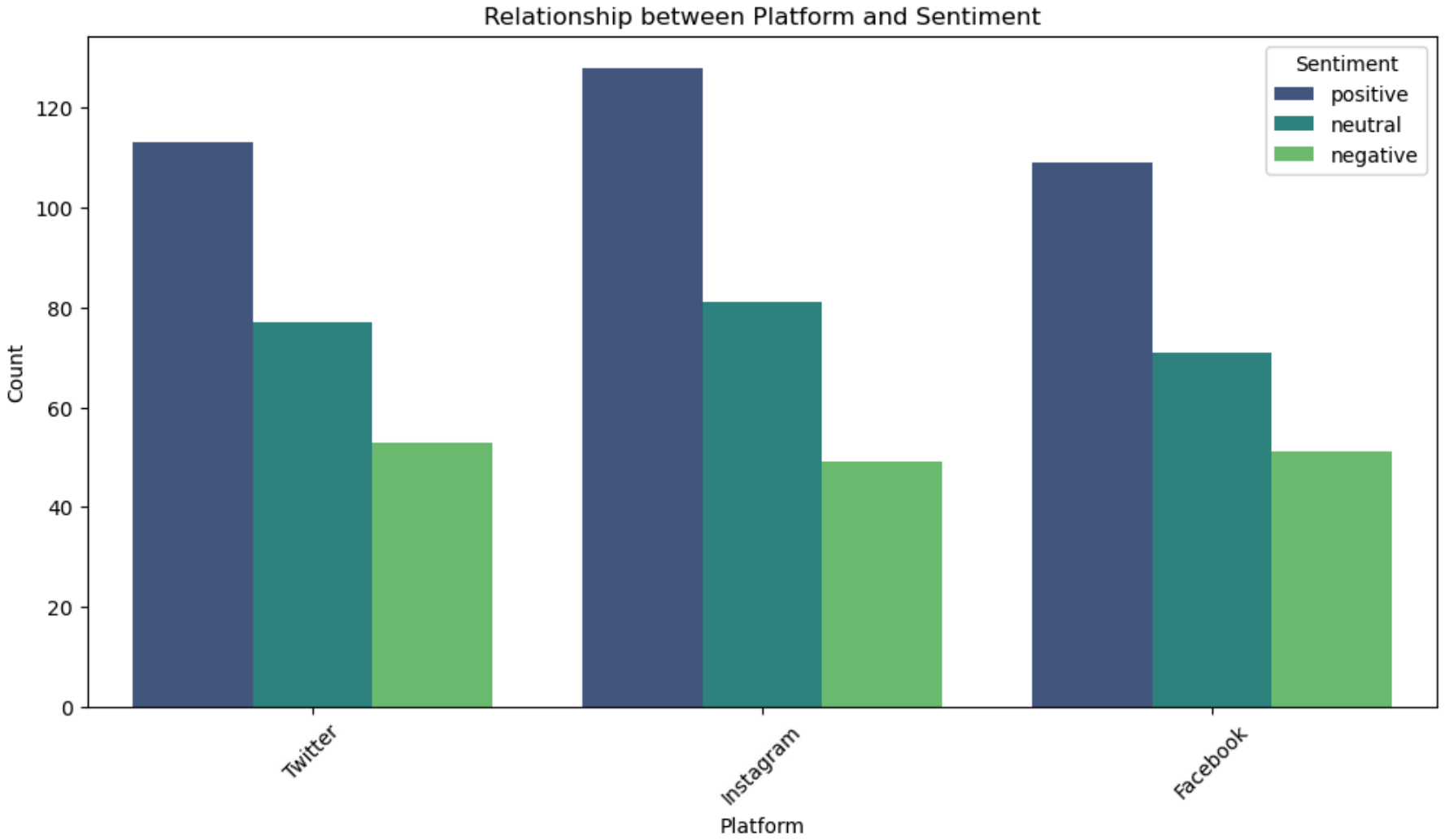
In [48]:
```
#df['Day_of_Week'] = df['Timestamp'].dt.day_name()
```

In [49]:
```
plt.figure(figsize=(12, 6))
sns.countplot(x='Day_of_Week', hue='Sentiment', data=df1, palette='viridis')
plt.title('Relationship between Day of Week and Sentiment')
plt.xlabel('Day of Week')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.show()
```



Relationship B/w Platform & Sentiments

In [50]:
```
plt.figure(figsize=(12, 6))
sns.countplot(x='Platform', hue='Sentiment', data=df1, palette='viridis')
plt.title('Relationship between Platform and Sentiment')
plt.xlabel('Platform')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.show()
```


Relationship between Platform and Sentiment
Sentiment
positive
neutral
negative
Count
0
20
40
60
80
100
120
Twitter
Instagram
Facebook
Platform

Common Words

In [57]:
```
df1['temp_list'] = df1['Clean_Text'].apply(lambda x: str(x).split())
top_words = Counter([item for sublist in df1['temp_list'] for item in sublist])
top_words_df = pd.DataFrame(top_words.most_common(20), columns=['Common_words', 'count'])

top_words_df.style.background_gradient(cmap='Blues')
```

Out[57]:

	Common_words	count
0	new	43
1	life	37
2	challeng	34
3	joy	31
4	danc	30
5	day	29
6	feel	29
7	like	28
8	dream	28
9	moment	27
10	emot	27
11	friend	26
12	heart	26
13	explor	25
14	echo	25
15	beauti	24
16	laughter	24
17	embrac	24
18	night	23
19	hope	23

Word Count

In [58]:
```
Positive_sent = df1[df1['Sentiment'] == 'positive']
Negative_sent = df1[df1['Sentiment'] == 'negative']
Neutral_sent = df1[df1['Sentiment'] == 'neutral']
```

Positive Common Words

In [59]:
```
top = Counter([item for sublist in df1[df1['Sentiment'] == 'positive']['temp_list'] for item in sublist])
temp_positive = pd.DataFrame(top.most_common(10), columns=['Common_words', 'count'])
temp_positive.style.background_gradient(cmap='Blues')
```

Out[59]:

	Common_words	count
0	joy	30
1	friend	24
2	laughter	24
3	new	21
4	challeng	20
5	life	20
6	hope	20
7	dream	20
8	embrac	19
9	like	19

Neutral Common Words

In [60]:
```
top = Counter([item for sublist in df1[df1['Sentiment'] == 'neutral']['temp_list'] for item in sublist])
temp_positive = pd.DataFrame(top.most_common(10), columns=['Common_words', 'count'])
temp_positive.style.background_gradient(cmap='Greens')
```

Out[60]:

	Common_words	count
0	new	22
1	explor	13
2	excit	12
3	life	12
4	beauti	12
5	night	12
6	danc	12
7	attend	11
8	seren	11
9	feel	10

Negative Common Words

In [61]:
```
top = Counter([item for sublist in df1[df1['Sentiment'] == 'negative']['temp_list'] for item in sublist])
temp_positive = pd.DataFrame(top.most_common(10), columns=['Common_words', 'count'])
temp_positive.style.background_gradient(cmap='Reds')
```

Out[61]:

	Common_words	count
0	despair	14
1	lost	14
2	emot	13
3	feel	11
4	bitter	10
5	storm	10
6	day	9
7	like	9
8	grief	8
9	heart	8

Data Preparation

In [62]:
```
df2 = df1.copy()
```

In [68]:
```
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.linear_model import PassiveAggressiveClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score, classification_report
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import SVC
from sklearn.naive_bayes import MultinomialNB
from sklearn.model_selection import RandomizedSearchCV
from sklearn.metrics import confusion_matrix
```

Splitting the Data

In [69]:
```
X = df2['Clean_Text'].values
y = df2['Sentiment'].values
```

In [70]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

Modeling

In [71]:
```
vectorizer = TfidfVectorizer(max_features=5000)
X_train_tfidf = vectorizer.fit_transform(X_train)
X_test_tfidf = vectorizer.transform(X_test)
```

SVM Classifier

In [72]:
```
svm_classifier = SVC(random_state=42)
svm_classifier.fit(X_train_tfidf, y_train)
```

Out[72]:
```
SVC(random_state=42)
```

In [73]:
```
y_pred_svm = svm_classifier.predict(X_test_tfidf)
accuracy_svm = accuracy_score(y_test, y_pred_svm)
classification_rep_svm = classification_report(y_test, y_pred_svm)
```

In [74]:
```
print("Support Vector Machine Results:")
print(f"Accuracy: {accuracy_svm}")
print("Classification Report:\n", classification_rep_svm)
```

```
Support Vector Machine Results:
Accuracy: 0.5986394557823129
Classification Report:
               precision    recall  f1-score   support

    negative       1.00      0.38      0.55        32
     neutral       0.94      0.31      0.47        55
    positive       0.50      0.98      0.67        60

    accuracy                           0.60       147
   macro avg       0.82      0.56      0.56       147
weighted avg       0.78      0.60      0.57       147
```

Random Forest Classifier

In [75]:
```
random_forest_classifier = RandomForestClassifier(random_state=42)
random_forest_classifier.fit(X_train_tfidf, y_train)
```

Out[75]:
```
RandomForestClassifier
RandomForestClassifier(random_state=42)
```

In [76]:
```
y_pred_rf = random_forest_classifier.predict(X_test_tfidf)
accuracy_rf = accuracy_score(y_test, y_pred_rf)
classification_rep_rf = classification_report(y_test, y_pred_rf)
```

In [77]:
```
print("\nRandom Forest Results:")
print(f"Accuracy: {accuracy_rf}")
print("Classification Report:\n", classification_rep_rf)
```

```
Random Forest Results:
Accuracy: 0.6530612244897959
Classification Report:
               precision    recall  f1-score   support

    negative       0.86      0.59      0.70        32
     neutral       0.77      0.44      0.56        55
    positive       0.56      0.88      0.69        60

    accuracy                           0.65       147
   macro avg       0.73      0.64      0.65       147
weighted avg       0.71      0.65      0.64       147
```

Multinomial Naive Bayes

In [78]:
```
nb_classifier = MultinomialNB()
nb_classifier.fit(X_train_tfidf, y_train)
```

Out[78]:
```
MultinomialNB()
```

In [79]:
```
y_pred_nb = nb_classifier.predict(X_test_tfidf)
accuracy_nb = accuracy_score(y_test, y_pred_nb)
classification_rep_nb = classification_report(y_test, y_pred_nb)
```

In [80]:
```
print("\nMultinomial Naive Bayes Results:")
print(f"Accuracy: {accuracy_nb}")
print("Classification Report:\n", classification_rep_nb)
```

```
Multinomial Naive Bayes Results:
Accuracy: 0.6190476190476191
Classification Report:
               precision    recall  f1-score   support

    negative       1.00      0.38      0.55        32
     neutral       0.90      0.35      0.50        55
    positive       0.53      1.00      0.69        60

    accuracy                           0.62       147
   macro avg       0.81      0.57      0.58       147
weighted avg       0.77      0.62      0.59       147
```

Best Modeling : Random Forest Classifier

In [81]:
```
param_dist = {
    'n_estimators': [100, 200, 300],
    'max_depth': [None, 10, 20, 30]
}

```

In [82]:
```
RF_classifier = RandomForestClassifier(random_state=42)

randomized_search = RandomizedSearchCV(RF_classifier, param_distributions=param_dist, n_iter=10, cv=5, scoring='a
randomized_search.fit(X_train_tfidf, y_train)
```

Out[82]:
```
RandomizedSearchCV
estimator: RandomForestClassifier
    RandomForestClassifier
```

In [83]:
```
best_params_randomized = randomized_search.best_params_
best_params_randomized
```

Out[83]:
```
{'n_estimators': 100, 'max_depth': None}
```

In [84]:
```
best_RF_classifier_randomized = RandomForestClassifier(random_state=42, **best_params_randomized)
best_RF_classifier_randomized.fit(X_train_tfidf, y_train)
```

Out[84]:
```
RandomForestClassifier
RandomForestClassifier(random_state=42)
```

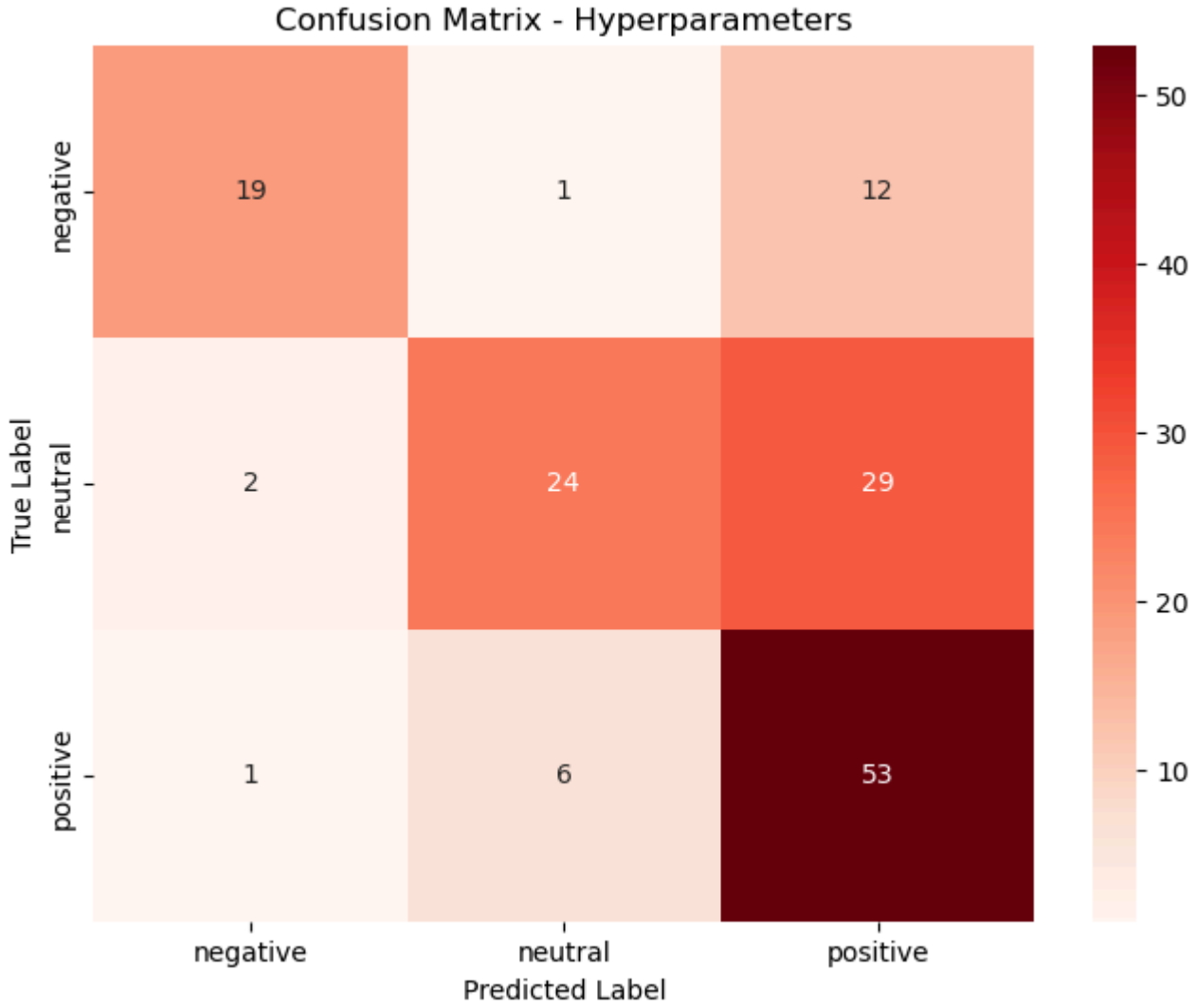
In [85]:
```
y_pred_best_RF_randomized = best_RF_classifier_randomized.predict(X_test_tfidf)
```

In [86]:
```
accuracy_best_RF_randomized = accuracy_score(y_test, y_pred_best_RF_randomized)
classification_rep_best_RF_randomized = classification_report(y_test, y_pred_best_RF_randomized)
conf_matrix_test = confusion_matrix(y_test, y_pred_best_RF_randomized)
```

In [87]:
```
print("Best RandomForestClassifier Model (RandomizedSearchCV):")
print(f"Best Hyperparameters: {best_params_randomized}")
print(f"Accuracy: {accuracy_best_RF_randomized}")
print("Classification Report:\n", classification_rep_best_RF_randomized)
```

```
Best RandomForestClassifier Model (RandomizedSearchCV):
Best Hyperparameters: {'n_estimators': 100, 'max_depth': None}
Accuracy: 0.6530612244897959
Classification Report:
               precision    recall  f1-score   support

    negative       0.86      0.59      0.70        32
     neutral       0.77      0.44      0.56        55
    positive       0.56      0.88      0.69        60

    accuracy                           0.65       147
   macro avg       0.73      0.64      0.65       147
weighted avg       0.71      0.65      0.64       147
```

In [88]:
```
plt.figure(figsize=(8, 6))
sns.heatmap(conf_matrix_test, annot=True, fmt='d', cmap='Reds', xticklabels=['negative', 'neutral', 'positive'],
plt.title('Confusion Matrix - Hyperparameters')
plt.xlabel('Predicted Label')
plt.ylabel('True Label')
plt.show()
```



In [ ]:
```
1
```