TP DE PYTHON AVANCE ELABORE PAR CT GIPOY MULENDA RODRIGUE DIRIGE PAR LE PROF MASAKUNA FELICIEN

Enoncé ¶

python : Analyse des sentiments sur les réseaux sociaux utilisation de données de medias sociaux pour analyser les tendances et les sentiments.

Entrée [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from colorama import Fore
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 C:\Users\ELIE
[nltk_data]     WEB\AppData\Roaming\nltk_data...
[nltk_data] Downloading package punkt to C:\Users\ELIE
[nltk_data]     WEB\AppData\Roaming\nltk_data...
[nltk_data]   Unzipping tokenizers\punkt.zip.
[nltk_data] Downloading package stopwords to C:\Users\ELIE
[nltk_data]     WEB\AppData\Roaming\nltk_data...
[nltk_data]   Unzipping corpora\stopwords.zip.
```

Entrée [2]:

```
df = pd.read_csv('sentimentdataset.csv')
df
```

Out[2]:

	Unnamed: 0	Unnamed: 0.1	Text	Sentiment	Timestamp	User	Platform	
0	0	0	Enjoying a beautiful day at the park! ...	Positive	2023-01-15 12:30:00	User123	Twitter	#N
1	1	1	Traffic was terrible this morning. ...	Negative	2023-01-15 08:45:00	CommuterX	Twitter	#Traff
2	2	2	Just finished an amazing workout! 💪 ...	Positive	2023-01-15 15:45:00	FitnessFan	Instagram	#Fitnes
3	3	3	Excited about the upcoming weekend getaway! ...	Positive	2023-01-15 18:20:00	AdventureX	Facebook	#Travel
4	4	4	Trying out a new recipe for dinner tonight. ...	Neutral	2023-01-15 19:55:00	ChefCook	Instagram	#Coc
...	...	...	...	...	...	...	...	
727	728	732	Collaborating on a science project that receiv...	Happy	2017-08-18 18:20:00	ScienceProjectSuccessHighSchool	Facebook	#Science #HighSch
728	729	733	Attending a surprise birthday party organized ...	Happy	2018-06-22 14:15:00	BirthdayPartyJoyHighSchool	Instagram	#Surprise #HighSchoo
729	730	734	Successfully fundraising for a school charity ...	Happy	2019-04-05 17:30:00	CharityFundraisingTriumphHighSchool	Twitter	#Comm #HighSchoolF
730	731	735	Participating in a multicultural festival, cel...	Happy	2020-02-29 20:45:00	MulticulturalFestivalJoyHighSchool	Facebook	#Cultural #HighS
731	732	736	Organizing a virtual talent show during challe...	Happy	2020-11-15 15:15:00	VirtualTalentShowSuccessHighSchool	Instagram	#VirtualEn #HighSchc

732 rows × 15 columns

Entrée [3]:

```
df.duplicated().sum()
```

Out[3]:

```
0
```

Entrée [4]:

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


count_distinct_value()
```

```
Unnamed: 0: 732 distinct values
Unnamed: 0.1: 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
```

Entrée [5]:

```
df = df.drop(columns=['Unnamed: 0.1', 'Unnamed: 0'])
```

Entrée [6]:
```
df
```

Out[6]:

	Text	Sentiment	Timestamp	User	Platform	Hashtags	Retweets
0	Enjoying a beautiful day at the park! ...	Positive	2023-01-15 12:30:00	User123	Twitter	#Nature #Park	15.0
1	Traffic was terrible this morning. ...	Negative	2023-01-15 08:45:00	CommuterX	Twitter	#Traffic #Morning	5.0
2	Just finished an amazing workout! 💪 ...	Positive	2023-01-15 15:45:00	FitnessFan	Instagram	#Fitness #Workout	20.0
3	Excited about the upcoming weekend getaway! ...	Positive	2023-01-15 18:20:00	AdventureX	Facebook	#Travel #Adventure	8.0
4	Trying out a new recipe for dinner tonight. ...	Neutral	2023-01-15 19:55:00	ChefCook	Instagram	#Cooking #Food	12.0
...	...	...	...	...	...	...	...
727	Collaborating on a science project that receiv...	Happy	2017-08-18 18:20:00	ScienceProjectSuccessHighSchool	Facebook	#ScienceFairWinner #HighSchoolScience	20.0
728	Attending a surprise birthday party organized ...	Happy	2018-06-22 14:15:00	BirthdayPartyJoyHighSchool	Instagram	#SurpriseCelebration #HighSchoolFriendship	25.0
729	Successfully fundraising for a school charity ...	Happy	2019-04-05 17:30:00	CharityFundraisingTriumphHighSchool	Twitter	#CommunityGiving #HighSchoolPhilanthropy	22.0
730	Participating in a multicultural festival, cel...	Happy	2020-02-29 20:45:00	MulticulturalFestivalJoyHighSchool	Facebook	#CulturalCelebration #HighSchoolUnity	21.0
731	Organizing a virtual talent show during challe...	Happy	2020-11-15 15:15:00	VirtualTalentShowSuccessHighSchool	Instagram	#VirtualEntertainment #HighSchoolPositivity	24.0

732 rows × 13 columns

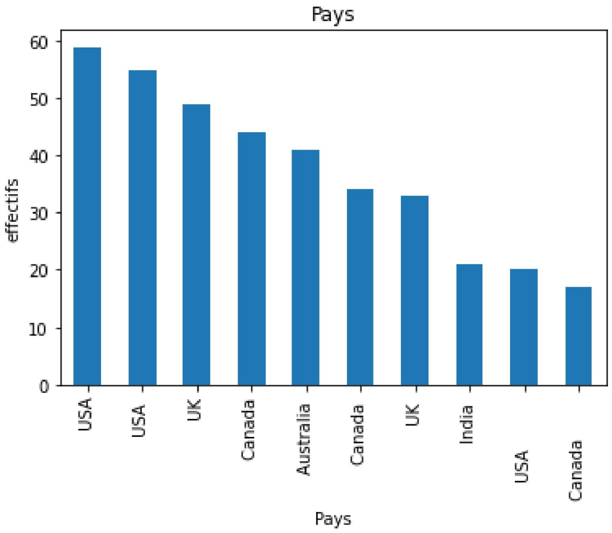
Entrée [7]:
```
df['Platform'].value_counts()
```

Out[7]:
```
 Instagram     258
 Facebook      231
 Twitter       128
 Twitter       115
Name: Platform, dtype: int64
```

Entrée [8]:
```
df["Country"].value_counts()
```

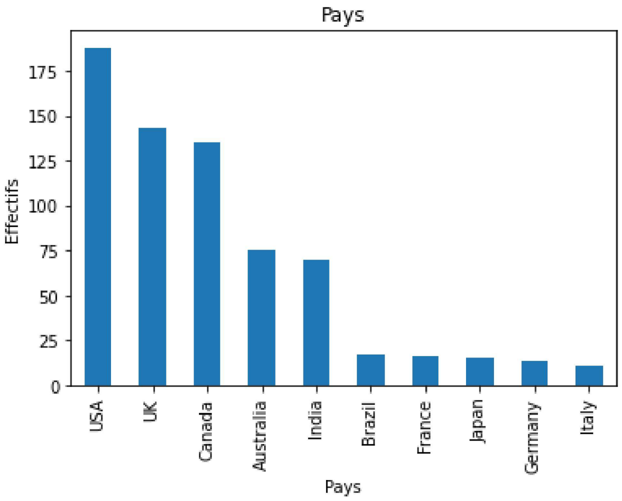
Out[8]:
```
 USA                59
 USA                55
 UK                 49
 Canada             44
 Australia          41
                    ..
 Netherlands         1
 USA                 1
 Germany             1
 France              1
 USA                 1
Name: Country, Length: 115, dtype: int64
```

Entrée [9]:
```
df['Country'].value_counts().nlargest(10).plot(kind='bar')
plt.title('Pays')
plt.xlabel('Pays')
plt.ylabel('effectifs')
plt.show()
```



Entrée [10]:
```
# Aggregation de pays
df['Country'] = df['Country'].str.strip()
```

Entrée [11]:
```
df['Country'].value_counts().nlargest(10).plot(kind='bar')
plt.title('Pays')
plt.xlabel('Pays')
plt.ylabel('Effectifs')
plt.show()
```



Entrée [12]:

```
# Conversion de la colonne 'Timestamp' en datetime
df['Timestamp'] = pd.to_datetime(df['Timestamp'])
# Analyse temporelle
df['Hour'] = df['Timestamp'].dt.hour

map_mois = {
    1: 'Janvier',
    2: 'Fevrier',
    3: 'Mars',
    4: 'Avril',
    5: 'Mai',
    6: 'Juin',
    7: 'Juillet',
    8: 'Août',
    9: 'Septembre',
    10: 'Octobre',
    11: 'Novembre',
    12: 'Decembre'
}
df['Month'] = df['Month'].map(map_mois)

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

Entrée [13]:

```
df_test = df.copy()

def categorize_sentiment(sentiment):
    positive_sentiments = ['Happiness', 'Joy', 'Love', 'Amusement', 'Enjoyment', 'Admiration', 'Aff
                           'Surprise', 'Acceptance', 'Adoration', 'Anticipation', 'Calmness', 'Exci
                           'Kind', 'Pride', 'Shame', 'Elation', 'Euphoria', 'Contentment', 'Serenit
                           'Hope', 'Empowerment', 'Compassion', 'Tenderness', 'Arousal', 'Enthusias
                           'Fulfillment', 'Reverence', 'Hopeful', 'Proud', 'Grateful', 'Empathetic'
                           'Playful', 'Free-spirited', 'Inspired', 'Confident']
    negative_sentiments = ['Anger', 'Fear', 'Sadness', 'Disgust', 'Bitter', 'Confusion', 'Despair',
                           'Loneliness', 'Jealousy', 'Resentment', 'Frustration', 'Boredom', 'Anxie
                           'Intimidation', 'Helplessness', 'Envy', 'Regret', 'Hate', 'Bad', 'Fearfu
                           'Dismissive', 'Nervous', 'Worried', 'Tense', 'Stressed', 'Depressed', 'M
                           'Lonely', 'Insecure', 'Guilty', 'Embarrassed', 'Mischievous', 'Sad']

    if sentiment.strip() in positive_sentiments:
        return 'Positive'
    elif sentiment.strip() in negative_sentiments:
        return 'Negative'
    else:
        return 'Neutral'

# Appliquer la fonction de regroupement sur la colonne des sentiments
df_test['Sentiment_Category'] = df_test['Sentiment'].apply(categorize_sentiment)
# Création de colonnes pour indiquer si le sentiment est positif, négatif ou neutre
df_test['Positive'] = df_test['Sentiment_Category'] == 'Positive'
df_test['Negative'] = df_test['Sentiment_Category'] == 'Negative'
df_test['Neutral'] = df_test['Sentiment_Category'] == 'Neutral'

df_test.head()
```

Out[13]:

	Text	Sentiment	Timestamp	User	Platform	Hashtags	Retweets	Likes	Country	Year	Month	Day	Hou
0	Enjoying a beautiful day at the park! ...	Positive	2023-01-15 12:30:00	User123	Twitter	#Nature #Park	15.0	30.0	USA	2023	Janvier	15	12
1	Traffic was terrible this morning. ...	Negative	2023-01-15 08:45:00	CommuterX	Twitter	#Traffic #Morning	5.0	10.0	Canada	2023	Janvier	15	8
2	Just finished an amazing workout! 💪 ...	Positive	2023-01-15 15:45:00	FitnessFan	Instagram	#Fitness #Workout	20.0	40.0	USA	2023	Janvier	15	15
3	Excited about the upcoming weekend getaway! ...	Positive	2023-01-15 18:20:00	AdventureX	Facebook	#Travel #Adventure	8.0	15.0	UK	2023	Janvier	15	18
4	Trying out a new recipe for dinner tonight. ...	Neutral	2023-01-15 19:55:00	ChefCook	Instagram	#Cooking #Food	12.0	25.0	Australia	2023	Janvier	15	19

Entrée [14]:
```
# Utilisation de PorterStemer et le stopwords des extensions de NLTK pour retirer les charactères
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
```

Entrée [15]:
```
df["Clean_Text"] = df["Text"]
```

Entrée [16]:
```
colonne_special= ['Platform','Country', 'Year','Month','Day']

for col in colonne_special:
    total_unique_values = df[col].nunique()
    print(f'Total unique values for {col}: {total_unique_values}')

    top_values = df[col].value_counts()

    colors = [Fore.RED, Fore.GREEN, Fore.YELLOW, Fore.BLUE, Fore.MAGENTA, Fore.CYAN, Fore.WHITE, Fo

    for i, (value, count) in enumerate(top_values.items()):
        color = colors[i % len(colors)]
        print(f'{color}{value}: {count}{Fore.RESET}')

    print('\n' + '=' * 30 + '\n')
```

```
Total unique values for Platform: 4
 Instagram : 258
 Facebook : 231
 Twitter : 128
 Twitter  : 115

==============================

Total unique values for Country: 33
USA: 188
UK: 143
Canada: 135
Australia: 75
India: 70
Brazil: 17
France: 16
Japan: 15
Germany: 14
Italy: 11
```

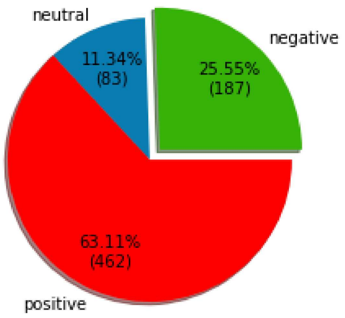
Entrée [17]:

```
# Separation de l'analyse dans une copy de du jeux de donnée acutel
df_sentiment = df.copy()

analyzer = SentimentIntensityAnalyzer()

df_sentiment['Vader_Score'] = df_sentiment['Clean_Text'].apply(lambda text: analyzer.polarity_score

df_sentiment['Sentiment'] = df_sentiment['Vader_Score'].apply(lambda score: 'positive' if score >=

print(df_sentiment[['Clean_Text', 'Vader_Score', 'Sentiment']].head(10))
```

```
                                         Clean_Text  Vader_Score Sentiment
0  Enjoying a beautiful day at the park!        ...       0.8221  positive
1  Traffic was terrible this morning.           ...      -0.4767  negative
2  Just finished an amazing workout! 💪          ...       0.6239  positive
3  Excited about the upcoming weekend getaway!  ...       0.4003  positive
4  Trying out a new recipe for dinner tonight.  ...       0.0000   neutral
5  Feeling grateful for the little things in lif...       0.5423  positive
6  Rainy days call for cozy blankets and hot coc...      -0.0772  negative
7  The new movie release is a must-watch!       ...       0.0000   neutral
8  Political discussions heating up on the timel...       0.0000   neutral
9  Missing summer vibes and beach days.         ...      -0.2960  negative
```

Entrée [18]:

```
# Repartition Proportionnelle des sentiments
colors = ['#37B209', '#097CB2', '#FF0000']

explode = (0.1, 0, 0)

sentiment_counts = df_sentiment.groupby("Sentiment").size()

fig, ax = plt.subplots()

wedges, texts, autotexts = ax.pie(
    x=sentiment_counts,
    labels=sentiment_counts.index,
    autopct=lambda p: f'{p:.2f}%\n({int(p*sum(sentiment_counts)/100)})',
    wedgeprops=dict(width=1),
    textprops=dict(size=10, color="black"),
    pctdistance=0.7,
    colors=colors,
    explode=explode,
    shadow=True)
```

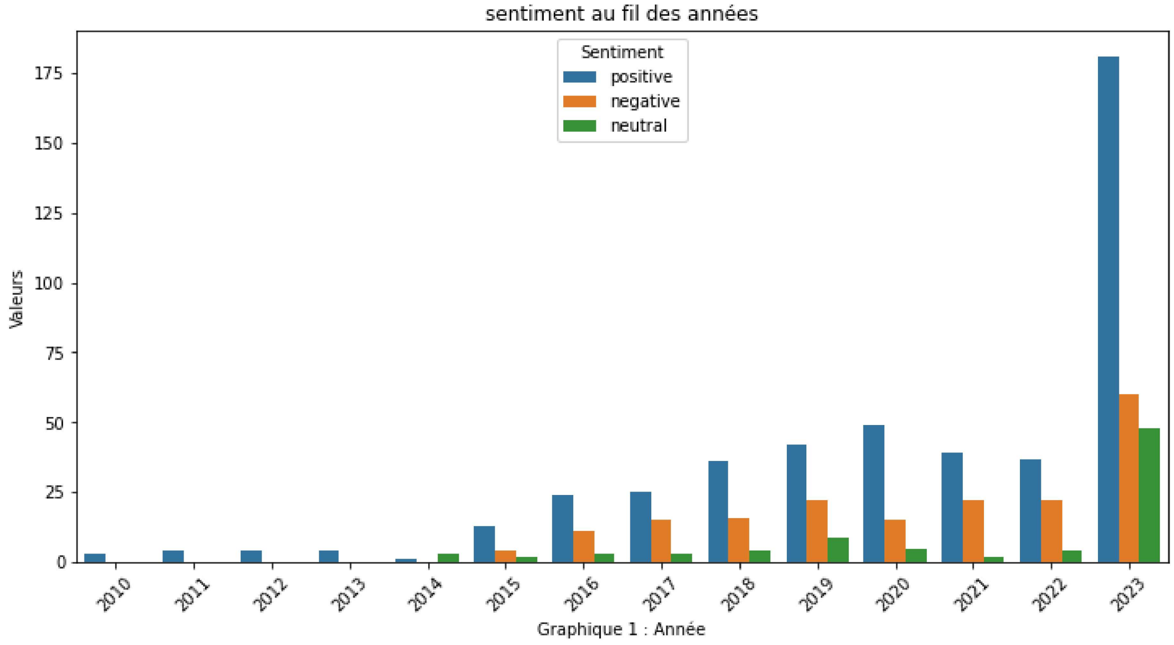


Entrée [19]:

```
center_circle = plt.Circle((0, 0), 0.6, color='white', fc='white', linewidth=1.25)
fig.gca().add_artist(center_circle)
ax.text(0, 0, 'Sentiment\nDistribution', ha='center', va='center', fontsize=14, fontweight='bold',

ax.legend(sentiment_counts.index, title="Sentiment", loc="center left", bbox_to_anchor=(1, 0, 0.5,

ax.axis('equal')

plt.show()
```

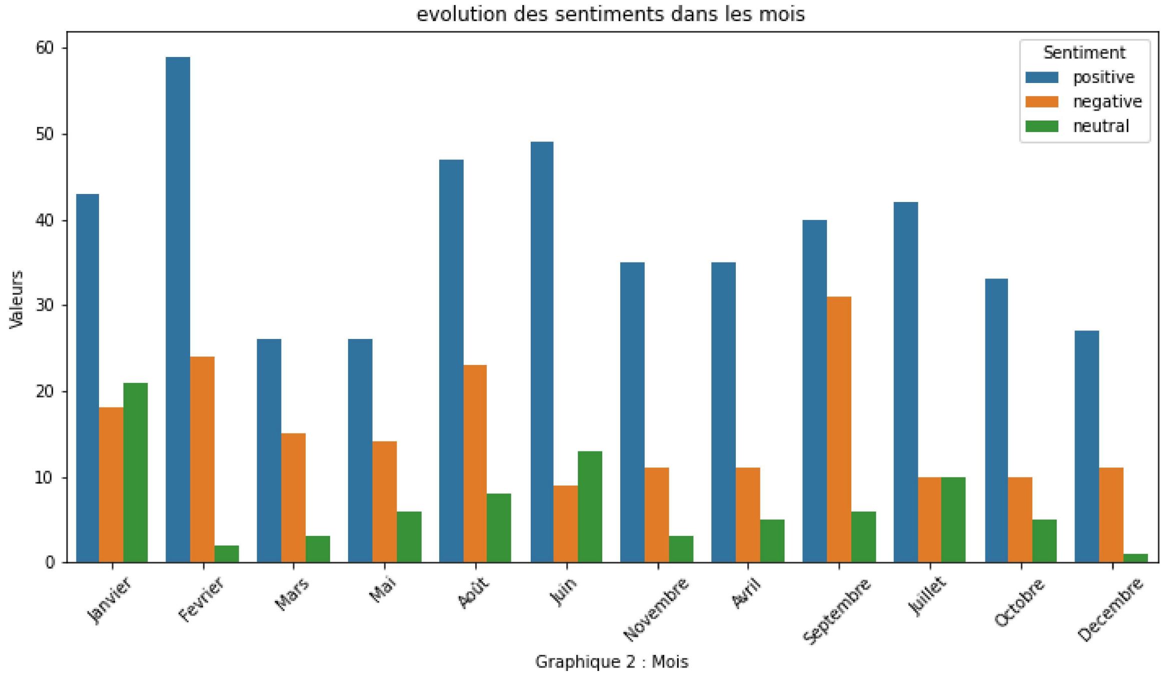
Entrée [20]:

```
plt.figure(figsize=(12, 6))
sns.countplot(x='Year', hue='Sentiment', data=df_sentiment)
plt.title('sentiment au fil des années')
plt.xlabel('Graphique 1 : Année')
plt.ylabel('Valeurs')
plt.xticks(rotation=45)
plt.show()
```



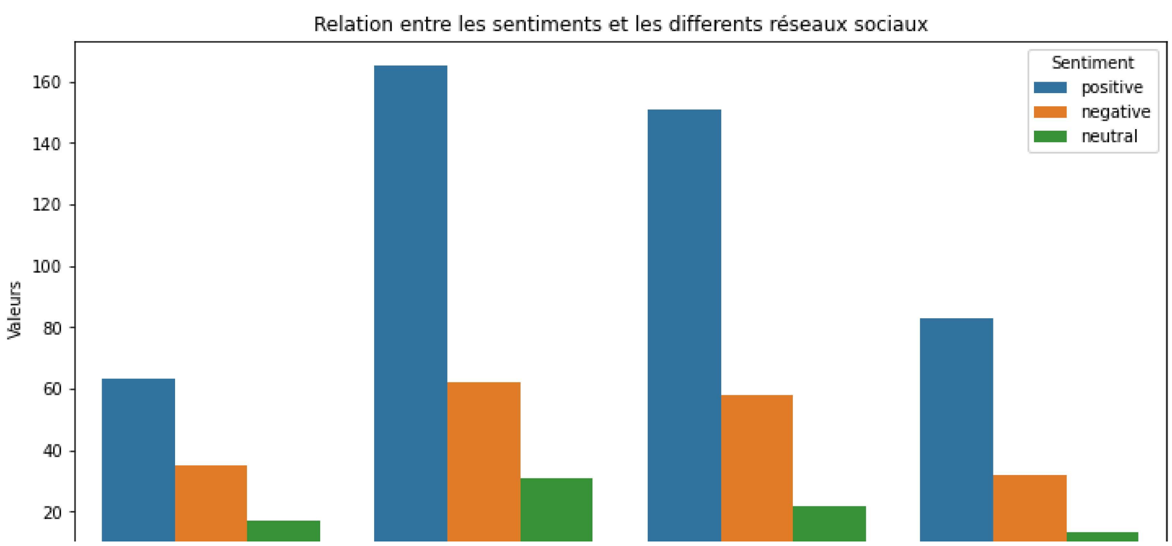
Entrée [21]:

```
plt.figure(figsize=(12, 6))
sns.countplot(x='Month', hue='Sentiment', data=df_sentiment)
plt.title('evolution des sentiments dans les mois')
plt.xlabel('Graphique 2 : Mois')
plt.ylabel('Valeurs')
plt.xticks(rotation=45)
plt.show()
```



Entrée [22]:

```
plt.figure(figsize=(12, 6))
sns.countplot(x='Platform', hue='Sentiment', data=df_sentiment)
plt.title('Relation entre les sentiments et les differents réseaux sociaux')
plt.xlabel('Graphique 3 :Réseaux social')
plt.ylabel('Valeurs')
plt.xticks(rotation=45)
plt.show()
```



CONCLUSION

Par rapport au données à notre disposition , nous pouvons observer à travers le Graphique 1, que les sentiments positives sur le media sociaux reste largement superieur au fil des années avec une montée remarquable en 2023. La même observation est faite dans les mois des années. Le graphique 3 montre egalement une expression positive des internautes d'instagram avec une tendance de plus en plus croissante d'utilisation du media sacial animé d'un sentiment positive .

Entrée [23]:

```
import nbformat
```

Entrée [24]:

```
with open('TP_PYTHON_Analyse_Sentiment.ipynb', 'r', encoding='utf-8') as f:
    notebook = nbformat.read(f, as_version=4)
```

Entrée [25]:

```
text_content = ""
for cell in notebook.cells:
    if cell.cell_type == 'code':
        text_content += f"### CODE CELL ###\n{cell.source}\n\n"
    elif cell.cell_type == 'markdown':
        text_content += f"### MARKDOWN CELL ###\n{cell.source}\n\n"
```

Entrée [26]:

```
with open('TP_PYTHON_Analyse_Sentiment.txt', 'w', encoding='utf-8') as f:
    f.write(text_content)
```

Entrée [27]:

```
print("Le contenu du notebook a été extrait avec succès dans le fichier 'TP_PYTHON_Analyse_Sentimen
```

```
Le contenu du notebook a été extrait avec succès dans le fichier 'TP_PYTHON_Analyse_Sentiment.tx
t'.
```

Entrée [ ]: