twitter

April 20, 2024

[1]:
```
import pandas as pd
import numpy as np
from nltk.tokenize import sent_tokenize, word_tokenize
from sklearn.feature_extraction.text import CountVectorizer
from sklearn.model_selection import train_test_split
from sklearn.svm import SVC
from sklearn.datasets import fetch_20newsgroups
from nltk.corpus import stopwords
import string
from nltk import pos_tag
from nltk.stem import WordNetLemmatizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.naive_bayes import MultinomialNB
from sklearn.ensemble import RandomForestClassifier
from sklearn.svm import SVC
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn import preprocessing
import seaborn as sns
import matplotlib.pyplot as plt
%matplotlib inline
```

[2]:
```
import nltk
nltk.download('stopwords')
```

```
[nltk_data] Downloading package stopwords to C:\Users\EL HASSANI
[nltk_data]     SAFAA\AppData\Roaming\nltk_data…
[nltk_data]   Unzipping corpora\stopwords.zip.
```

[2]:
```
True
```

[3]:
```
data = pd.read_csv('C:\\Users\\EL HASSANI␣
 ↪SAFAA\\Desktop\\Task4_dataset\\twitter_training.csv')
v_data = pd.read_csv('C:\\Users\\EL HASSANI␣
 ↪SAFAA\\Desktop\\Task4_dataset\\twitter_validation.csv')
```

[4]:
```
data
```

[4]:
```
        2401  Borderlands  Positive  \
0       2401  Borderlands  Positive
1       2401  Borderlands  Positive
2       2401  Borderlands  Positive
3       2401  Borderlands  Positive
4       2401  Borderlands  Positive
…        …           …         …
74676   9200       Nvidia  Positive
74677   9200       Nvidia  Positive
74678   9200       Nvidia  Positive
74679   9200       Nvidia  Positive
74680   9200       Nvidia  Positive

       im getting on borderlands and i will murder you all ,
0       I am coming to the borders and I will kill you…
1       im getting on borderlands and i will kill you …
2       im coming on borderlands and i will murder you…
3       im getting on borderlands 2 and i will murder …
4       im getting into borderlands and i can murder y…
…                                                     …
74676   Just realized that the Windows partition of my…
74677   Just realized that my Mac window partition is …
74678   Just realized the windows partition of my Mac …
74679   Just realized between the windows partition of…
74680   Just like the windows partition of my Mac is l…

[74681 rows x 4 columns]
```

[5]:
```
v_data
```

[5]:
```
      3364             Facebook  Irrelevant  \
0      352               Amazon     Neutral
1     8312            Microsoft    Negative
2     4371                CS-GO    Negative
3     4433               Google     Neutral
4     6273                 FIFA    Negative
..     …                    …         …
994   4891  GrandTheftAuto(GTA)  Irrelevant
995   4359                CS-GO  Irrelevant
996   2652           Borderlands    Positive
997   8069             Microsoft    Positive
998   6960       johnson&johnson     Neutral
```

I mentioned on Facebook that I was struggling for motivation to go for a run the other day, which has been translated by Tom's great auntie as 'Hayley can't get out of bed' and told to his grandma, who now thinks I'm a lazy, terrible person

```
0    BBC News - Amazon boss Jeff Bezos rejects clai…
1    @Microsoft Why do I pay for WORD when it funct…
2    CSGO matchmaking is so full of closet hacking,…
3    Now the President is slapping Americans in the…
4    Hi @EAHelp I've had Madeleine McCann in my cel…
..                                                 …
994   Toronto is the arts and culture capital of …
995  tHIS IS ACTUALLY A GOOD MOVE TOT BRING MORE VI…
996  Today sucked so it's time to drink wine n play…
997  Bought a fraction of Microsoft today. Small wins.
998  Johnson & Johnson to stop selling talc baby po…

[999 rows x 4 columns]
```

[6]:
```
data.columns = ['id', 'game', 'sentiment', 'text']
v_data.columns = ['id', 'game', 'sentiment', 'text']
```

[7]:
```
data
```

[7]:
```
          id         game sentiment  \
0       2401  Borderlands  Positive
1       2401  Borderlands  Positive
2       2401  Borderlands  Positive
3       2401  Borderlands  Positive
4       2401  Borderlands  Positive
…        …           …        …
74676   9200       Nvidia  Positive
74677   9200       Nvidia  Positive
74678   9200       Nvidia  Positive
74679   9200       Nvidia  Positive
74680   9200       Nvidia  Positive

                                                    text
0       I am coming to the borders and I will kill you…
1       im getting on borderlands and i will kill you …
2       im coming on borderlands and i will murder you…
3       im getting on borderlands 2 and i will murder …
4       im getting into borderlands and i can murder y…
…                                                     …
74676   Just realized that the Windows partition of my…
74677   Just realized that my Mac window partition is …
74678   Just realized the windows partition of my Mac …
74679   Just realized between the windows partition of…
74680   Just like the windows partition of my Mac is l…

[74681 rows x 4 columns]
```

[8]:
```
v_data
```

[8]:
```
       id                 game   sentiment  \
0     352               Amazon     Neutral
1    8312            Microsoft    Negative
2    4371                CS-GO    Negative
3    4433               Google     Neutral
4    6273                 FIFA    Negative
..    …                   …         …
994  4891  GrandTheftAuto(GTA)  Irrelevant
995  4359                CS-GO  Irrelevant
996  2652          Borderlands    Positive
997  8069            Microsoft    Positive
998  6960      johnson&johnson     Neutral

                                                  text
0    BBC News - Amazon boss Jeff Bezos rejects clai…
1    @Microsoft Why do I pay for WORD when it funct…
2    CSGO matchmaking is so full of closet hacking,…
3    Now the President is slapping Americans in the…
4    Hi @EAHelp I’ve had Madeleine McCann in my cel…
..                                                 …
994   Toronto is the arts and culture capital of …
995  tHIS IS ACTUALLY A GOOD MOVE TOT BRING MORE VI…
996  Today sucked so it’s time to drink wine n play…
997  Bought a fraction of Microsoft today. Small wins.
998  Johnson & Johnson to stop selling talc baby po…

[999 rows x 4 columns]
```

[9]:
```
data.shape
```

[9]:
```
(74681, 4)
```

[10]:
```
data.columns
```

[10]:
```
Index(['id', 'game', 'sentiment', 'text'], dtype='object')
```

[11]:
```
data.describe(include='all')
```

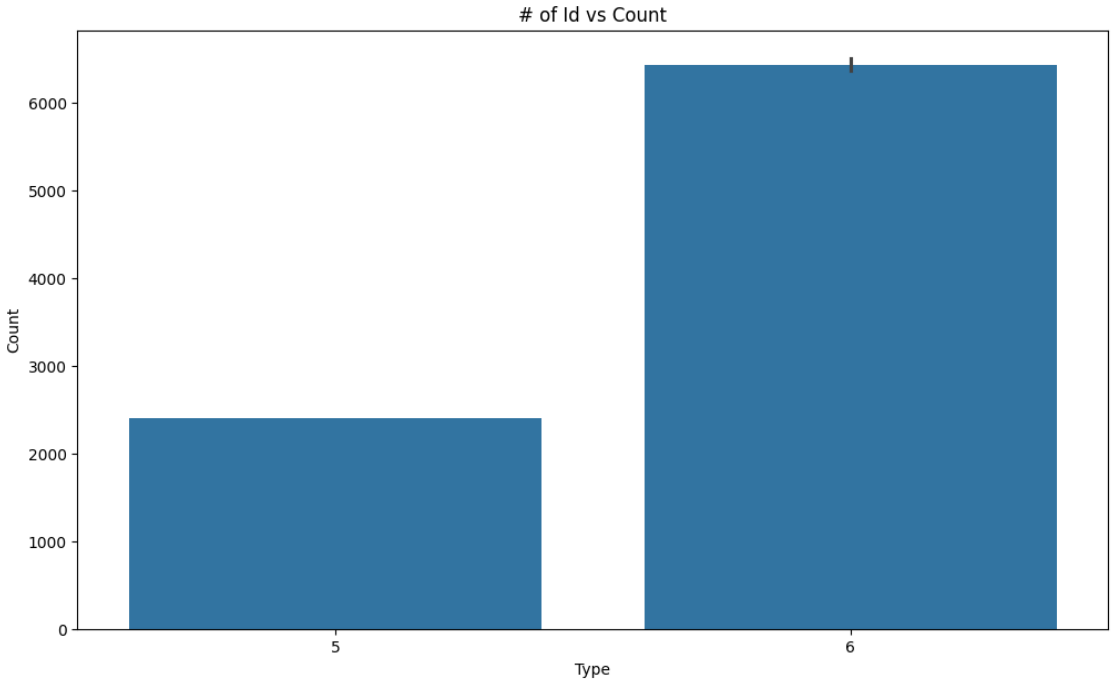
[11]:
```
                  id                 game sentiment   text
count   74681.000000                74681     74681  73995
unique           NaN                   32         4  69490
top              NaN  TomClancysRainbowSix  Negative
freq             NaN                 2400     22542    172
mean     6432.640149                  NaN       NaN    NaN
std      3740.423819                  NaN       NaN    NaN
```

```
min         1.000000                   NaN       NaN    NaN
25%      3195.000000                   NaN       NaN    NaN
50%      6422.000000                   NaN       NaN    NaN
75%      9601.000000                   NaN       NaN    NaN
max     13200.000000                   NaN       NaN    NaN
```

[12]:
```
id_types = data['id'].value_counts()
id_types
```

[12]:
```
id
5203    6
6164    6
6141    6
6142    6
6143    6
       ..
4678    6
4679    6
4680    6
4681    6
2401    5
Name: count, Length: 12447, dtype: int64
```

[13]:
```
plt.figure(figsize=(12,7))
sns.barplot(y=id_types.index, x=id_types.values)
plt.xlabel('Type')
plt.ylabel('Count')
plt.title('# of Id vs Count')
plt.show()
```

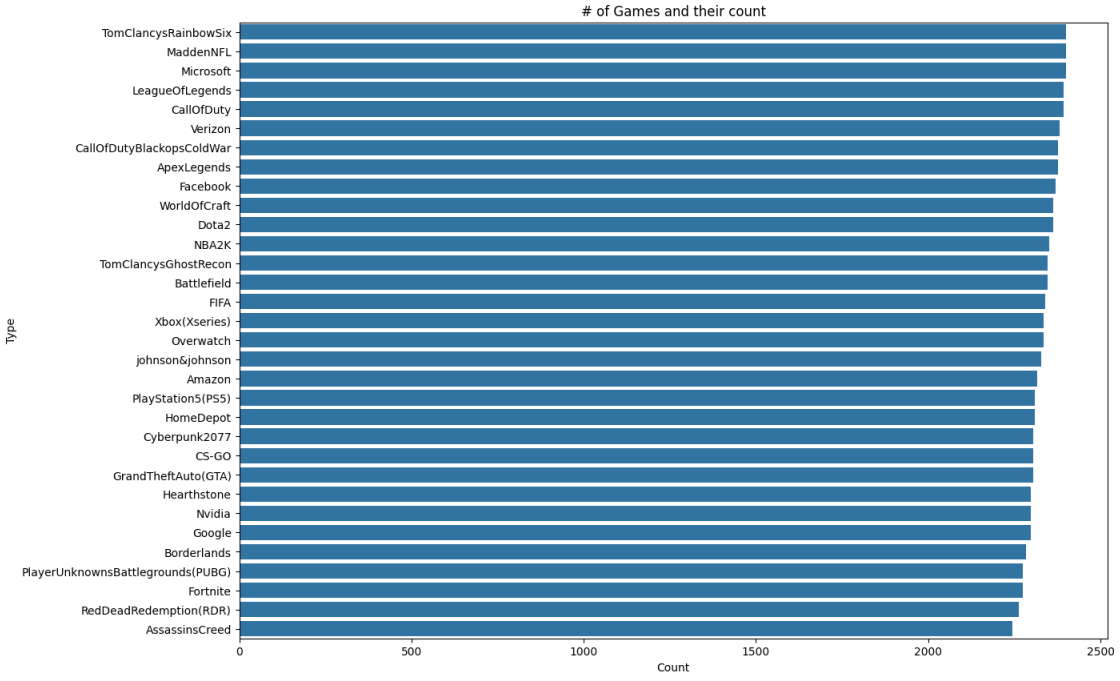


[14]:
```
game_types = data['game'].value_counts()
game_types
```

[14]:
```
game
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
```

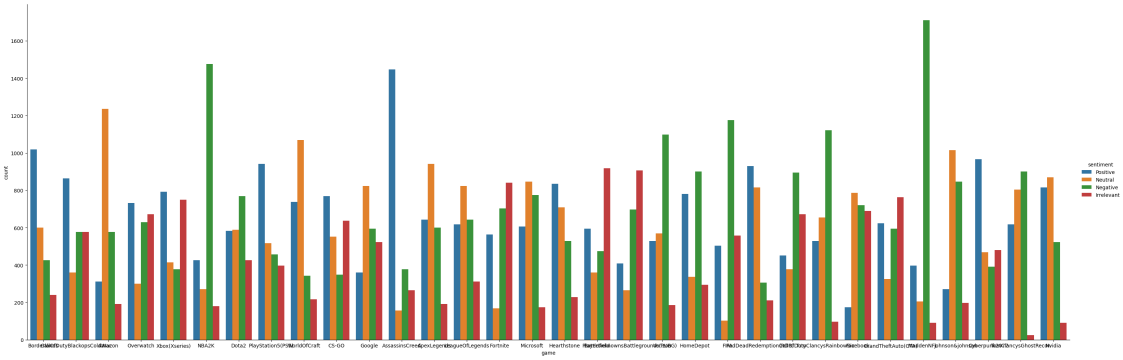
```
Cyberpunk2077                          2304
CS-GO                                  2304
GrandTheftAuto(GTA)                    2304
Hearthstone                            2298
Nvidia                                 2298
Google                                 2298
Borderlands                            2285
PlayerUnknownsBattlegrounds(PUBG)      2274
Fortnite                               2274
RedDeadRedemption(RDR)                 2262
AssassinsCreed                         2244
Name: count, dtype: int64
```

[15]:
```
plt.figure(figsize=(14,10))

sns.barplot(x=game_types.values,y=game_types.index)
plt.title('# of Games and their count')
plt.ylabel('Type')
plt.xlabel('Count')

plt.show()
```



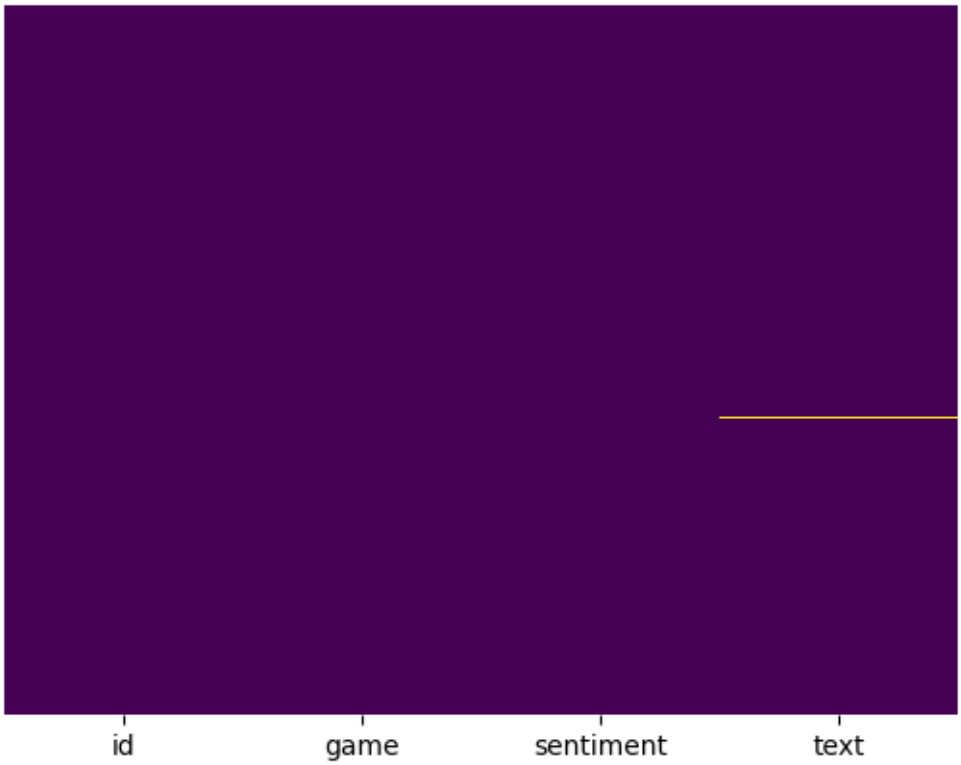
[16]:
```
sns.catplot(x="game",hue="sentiment", kind="count",height=10,aspect=3,␣
↪data=data)
```

[16]: <seaborn.axisgrid.FacetGrid at 0x199bbdbe9f0>



[17]:
```
sns.heatmap(data.isnull(),yticklabels=False,cbar=False,cmap='viridis')
```

[17]: <Axes: >



[18]:
```
total_null=data.isnull().sum().sort_values(ascending=False)
percent = ((data.isnull().sum()/data.isnull().count())*100).
  ↪sort_values(ascending = False)
```

```
print("Total records = ", data.shape[0])
missing_data = pd.concat([total_null,percent.round(2)],axis=1,keys=['Total␣
 ↪Missing','In Percent'])
missing_data.head(10)
```

```
Total records =  74681
```

[18]:

	Total Missing	In Percent
text	686	0.92
id	0	0.00
game	0	0.00
sentiment	0	0.00

[19]:
```
data.dropna(subset=['text'],inplace=True)

total_null=data.isnull().sum().sort_values(ascending=False)
percent = ((data.isnull().sum()/data.isnull().count())*100).
 ↪sort_values(ascending = False)
print("Total records = ", data.shape[0])
missing_data = pd.concat([total_null,percent.round(2)],axis=1,keys=['Total␣
 ↪Missing','In Percent'])
missing_data.head(10)
```

```
Total records =  73995
```

[19]:

	Total Missing	In Percent
id	0	0.0
game	0	0.0
sentiment	0	0.0
text	0	0.0

[20]:
```
train0=data[data['sentiment']=="Negative"]
train1=data[data['sentiment']=="Positive"]
train2=data[data['sentiment']=="Irrelevant"]
train3=data[data['sentiment']=="Neutral"]
```

[21]:
```
train0.shape, train1.shape, train2.shape, train3.shape
```

[21]:
```
((22358, 4), (20654, 4), (12875, 4), (18108, 4))
```

[22]:
```
train0=train0[:int(train0.shape[0]/12)]
train1=train1[:int(train1.shape[0]/12)]
train2=train2[:int(train2.shape[0]/12)]
train3=train3[:int(train3.shape[0]/12)]
```

[23]:
```
train0.shape, train1.shape, train2.shape, train3.shape
```

[23]:
```
((1863, 4), (1721, 4), (1072, 4), (1509, 4))
```

[24]:
```
data=pd.concat([train0,train1,train2,train3],axis=0)
data
```

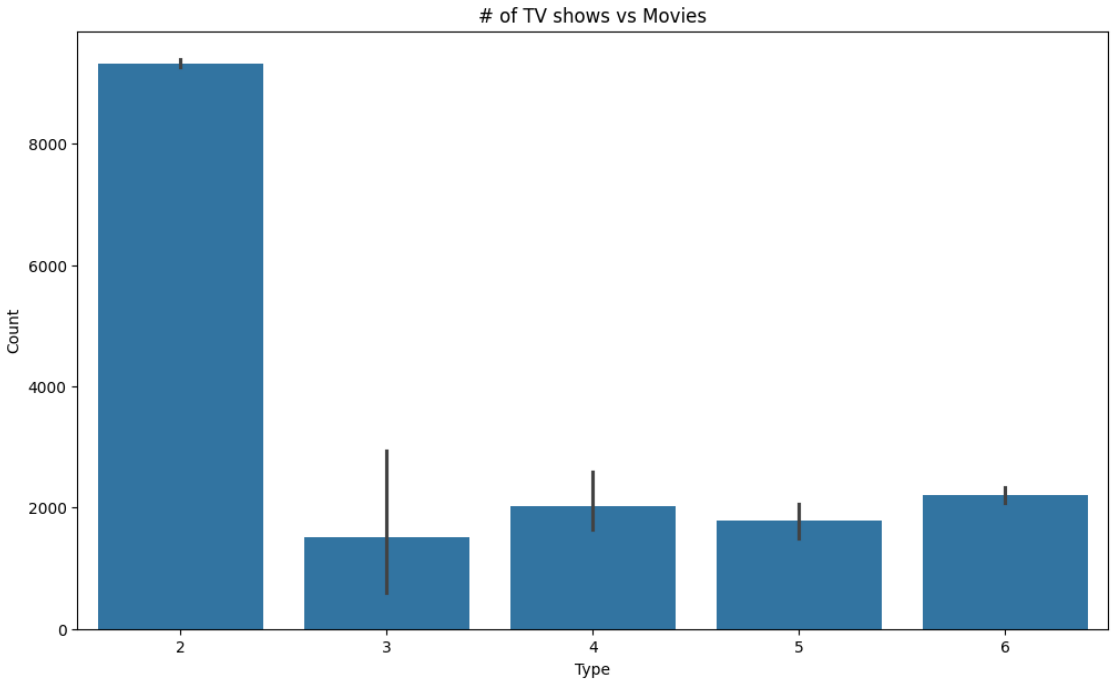
[24]:
```
        id         game sentiment  \
23    2405  Borderlands  Negative
24    2405  Borderlands  Negative
25    2405  Borderlands  Negative
26    2405  Borderlands  Negative
27    2405  Borderlands  Negative
…      …           …        …
5603   165       Amazon   Neutral
5604   165       Amazon   Neutral
5605   165       Amazon   Neutral
5606   165       Amazon   Neutral
5607   165       Amazon   Neutral

                                                   text
23    the biggest dissappoinment in my life came out…
24    The biggest disappointment of my life came a y…
25    The biggest disappointment of my life came a y…
26    the biggest dissappoinment in my life coming o…
27    For the biggest male dissappoinment in my life…
…                                                   …
5603  An amazing read aloud book for you and your ch…
5604  An amazing reading book for you and your child…
5605  An amazing book to read aloud for you and your…
5606  An amazing read aloud book for you and your ch…
5607  and An amazing read aloud book for you and you…

[6165 rows x 4 columns]
```

[25]:
```
id_types = data['id'].value_counts()
id_types
```

[25]:
```
id
2405    6
1810    6
1748    6
1754    6
1760    6
       ..
1602    3
1880    3
333     3
9388    2
```

```
9267    2
Name: count, Length: 1040, dtype: int64
```

[26]:
```
plt.figure(figsize=(12,7))
sns.barplot(x=id_types.values,y=id_types.index)

plt.xlabel('Type')
plt.ylabel('Count')
plt.title('# of TV shows vs Movies')
plt.show()
```

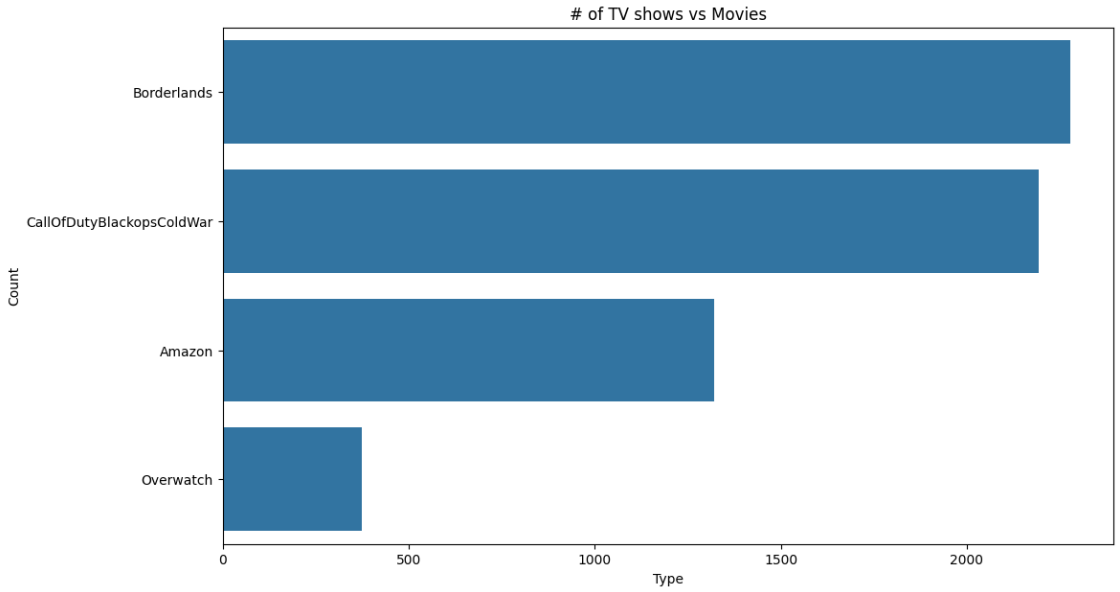


[27]:
```
game_types = data['game'].value_counts()
game_types
```

[27]:
```
game
Borderlands                  2279
CallOfDutyBlackopsColdWar    2192
Amazon                       1321
Overwatch                     373
Name: count, dtype: int64
```

[28]:
```
plt.figure(figsize=(12,7))
sns.barplot(x=game_types.values,y=game_types.index)

plt.xlabel('Type')
```

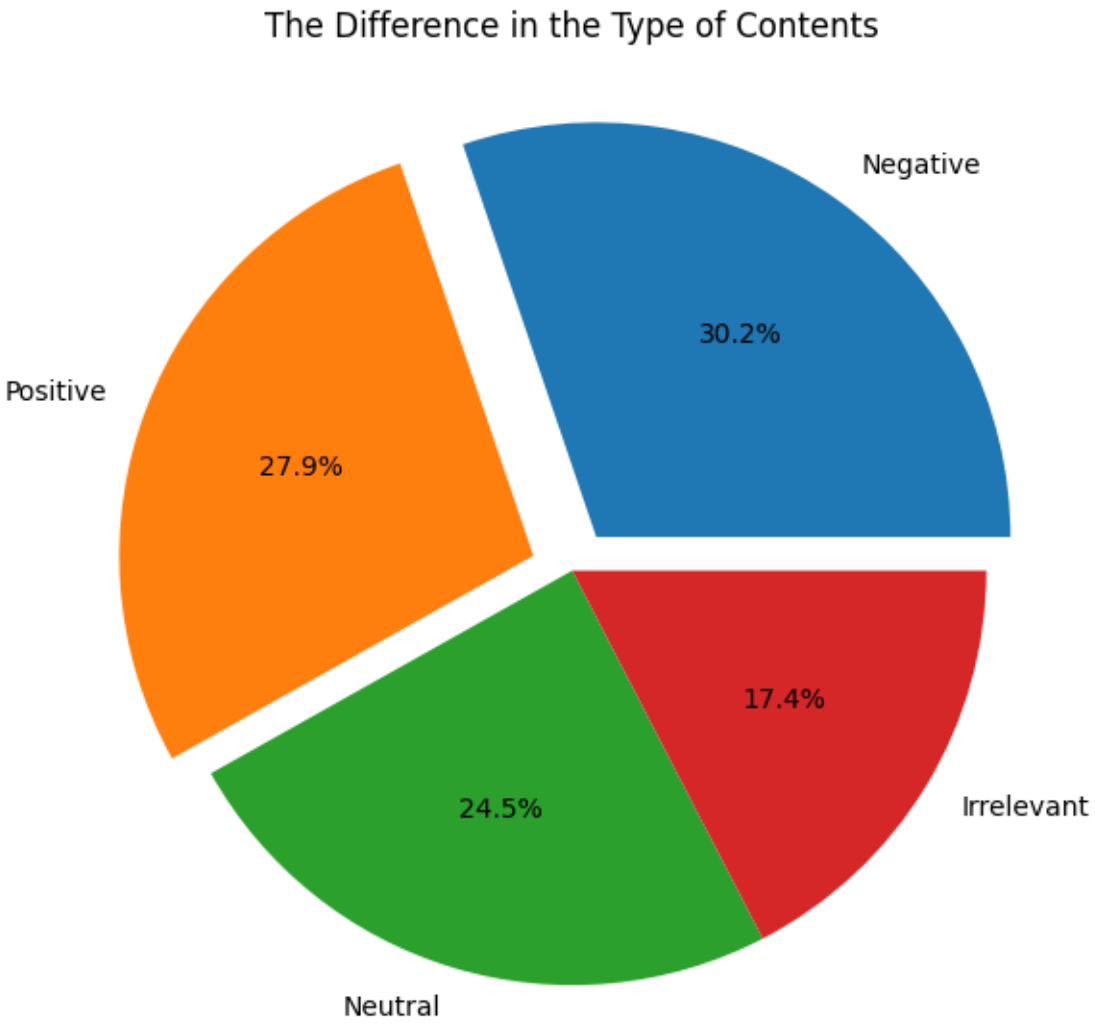
```
plt.ylabel('Count')
plt.title('# of TV shows vs Movies')
plt.show()
```



[29]:
```
sentiment_types = data['sentiment'].value_counts()
sentiment_types
```

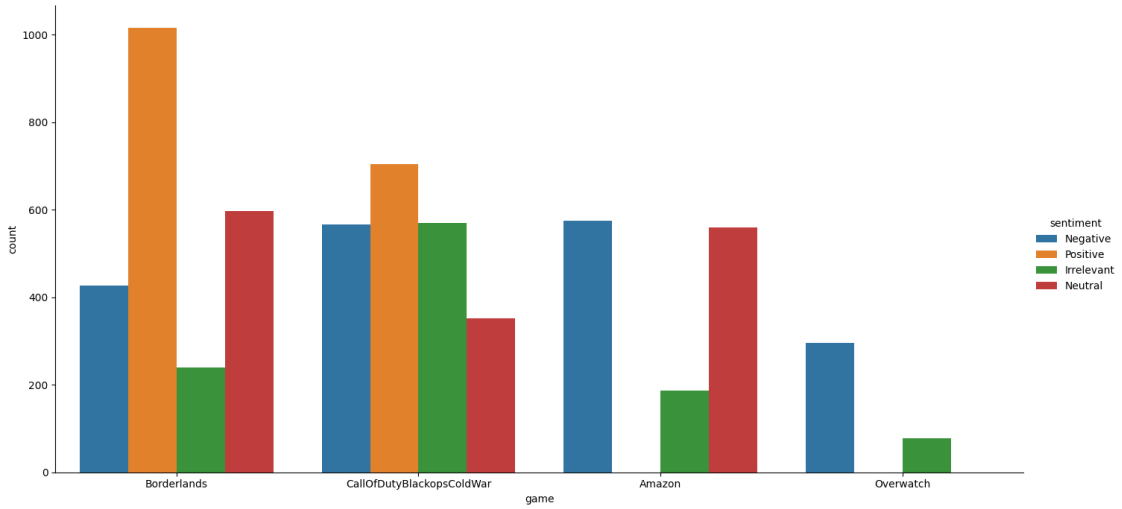
[29]:
```
sentiment
Negative      1863
Positive      1721
Neutral       1509
Irrelevant    1072
Name: count, dtype: int64
```

[30]:
```
plt.figure(figsize=(12,7))
plt.pie(x=sentiment_types.values, labels=sentiment_types.index, autopct='%.
  ↪1f%%', explode=[0.1, 0.1,0,0])
plt.title('The Difference in the Type of Contents')
plt.show()
```



[31]:
```
sns.catplot(x='game',hue='sentiment',kind='count',height=7,aspect=2,data=data)
```

[31]:
```
<seaborn.axisgrid.FacetGrid at 0x199c19d1c40>
```



[32]:
```
from sklearn import preprocessing
label_encoder = preprocessing.LabelEncoder()
```

[33]:
```
data['sentiment']=label_encoder.fit_transform(data['sentiment'])
data['game']=label_encoder.fit_transform(data['game'])
v_data['sentiment']=label_encoder.fit_transform(v_data['sentiment'])
v_data['game']=label_encoder.fit_transform(v_data['game'])
```

[34]:
```
data = data.drop(['id'],axis=1)

data
```

[34]:

	game	sentiment	text
23	1	1	the biggest dissappoinment in my life came out…
24	1	1	The biggest disappointment of my life came a y…
25	1	1	The biggest disappointment of my life came a y…
26	1	1	the biggest dissappoinment in my life coming o…
27	1	1	For the biggest male dissappoinment in my life…
…	…	…	…
5603	0	2	An amazing read aloud book for you and your ch…
5604	0	2	An amazing reading book for you and your child…
5605	0	2	An amazing book to read aloud for you and your…
5606	0	2	An amazing read aloud book for you and your ch…
5607	0	2	and An amazing read aloud book for you and you…

[6165 rows x 3 columns]

[35]:
```
data.nunique()
```

[35]:
```
game            4
sentiment       4
text         5854
dtype: int64
```

[36]:
```
v_data.nunique()
```

[36]:
```
id           999
game          32
sentiment      4
text         998
dtype: int64
```

[ ]:
```

```