In [1]:
```
import pandas as pd
# Load dataset
disney_pplus_titles = pd.read_csv('disney_plus_titles.csv')
```

In [2]:
```
disney_pplus_titles .head()
```

Out[2]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	duration	
0	s1	Movie	A Spark Story	Jason Sterman, Leanne Dare	Apthon Corbin, Louis Gonzales	NaN	September 24, 2021	2021	TV-PG	88 min	Do
1	s2	Movie	Spooky Buddies	Robert Vince	Tucker Albrizzi, Diedrich Bader, Ameko Eks Mas...	United States, Canada	September 24, 2021	2011	G	93 min	
2	s3	Movie	The Fault in Our Stars	Josh Boone	Shailene Woodley, Ansel Elgort, Laura Dern, Sa...	United States	September 24, 2021	2014	PG-13	127 min	Ag
3	s4	TV Show	Dog: Impossible	NaN	Matt Beisner	United States	September 22, 2021	2019	TV-PG	2 Seasons	D
4	s5	TV Show	Spidey And His Amazing Friends	NaN	Benjamin Valic, Lily Sanfelippo, Jakari Fraser...	United States	September 22, 2021	2021	TV-Y	1 Season	

In [3]:
```
disney_pplus_titles .tail()
```

Out[3]:

	show_id	type	title	director	cast	country	date_added	release_year	rating	durati
1363	s1364	Movie	The Sword in the Stone	Wolfgang Reitherman	Sebastian Cabot, Karl Swenson, Rickie Sorensen...	United States	October 1, 2019	1963	G	80 m
1364	s1365	Movie	Those Calloways	Norman Tokar	Brian Keith, Vera Miles, Brandon de Wilde, Wal...	United States	October 1, 2019	1965	PG	132 m
1365	s1366	TV Show	Disney Kirby Buckets	NaN	Jacob Bertrand, Mekai Curtis, Cade Sutton, Oli...	United States	NaN	2014	TV-Y7	Seaso
1366	s1367	TV Show	Disney Mech-X4	NaN	Nathaniel Potvin, Raymond Cham, Kamran Lucas, ...	Canada	NaN	2016	TV-Y7	Seaso
1367	s1368	TV Show	Imagination Movers	NaN	Rich Collins, Dave Poche, Scott Durbin, Scott ...	United States	NaN	2008	TV-Y	Seaso

In [4]:
```
disney_pplus_titles .isnull().sum()
```

Out[4]:
```
show_id          0
type             0
title            0
director       440
cast           174
country        175
date_added       3
release_year     0
rating           2
duration         0
listed_in        0
description      0
dtype: int64
```

In [5]:
```
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from statsmodels.tsa.seasonal import seasonal_decompose
from statsmodels.tsa.holtwinters import ExponentialSmoothing
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.cluster import KMeans
from sklearn.decomposition import PCA
import nltk
from nltk.sentiment.vader import SentimentIntensityAnalyzer
```

In [6]:
```
# Print column names to verify
print(disney_pplus_titles.columns)
```

```
Index(['show_id', 'type', 'title', 'director', 'cast', 'country', 'date_added',
       'release_year', 'rating', 'duration', 'listed_in', 'description'],
      dtype='object')
```

In [7]:
```
# Example mapping dictionary for converting ratings to numerical values
rating_mapping = {
    'G': 1, 'TV-Y': 1, 'TV-G': 1,
    'PG': 2, 'TV-Y7': 2, 'TV-Y7-FV': 2, 'TV-PG': 2,
    'PG-13': 3, 'TV-14': 3
}
```

In [8]:
```
# Convert ratings to numerical values
disney_pplus_titles['rating'] = disney_pplus_titles['rating'].map(rating_mapping)
```

In [9]:
```
# Handle missing values in rating column
disney_pplus_titles['rating'].fillna(disney_pplus_titles['rating'].mean(), inplace=True
```

In [10]:
```
# Ensure 'release_year' is a column name
release_year_column = 'release_year'  # Ensure this matches the actual column name
```

In [11]:
```
# Preprocessing release_year
disney_pplus_titles[release_year_column] = pd.to_datetime(disney_pplus_titles[release_y
```

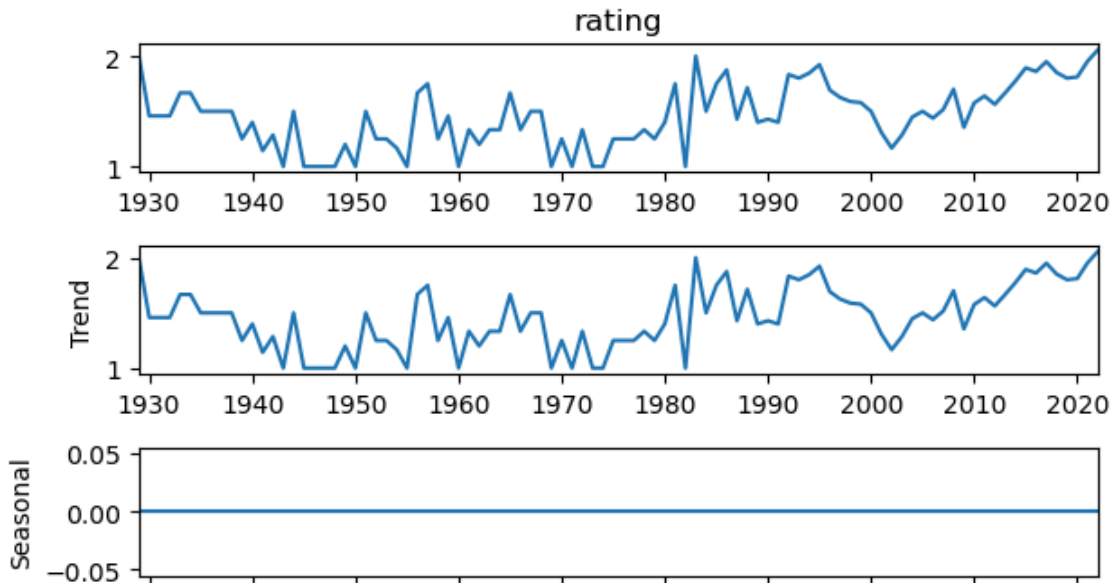
In [14]:
```
# Time Series Analysis
def time_series_analysis(df, date_column):
    df = df.set_index(date_column).resample('Y').mean()
    df['rating'].fillna(df['rating'].mean(), inplace=True)

    decomposition = seasonal_decompose(df['rating'], model='additive')
    decomposition.plot()
    plt.show()

    model = ExponentialSmoothing(df['rating'], trend='add', seasonal='add', seasonal_pe
    fit = model.fit()
    forecast = fit.forecast(12)

    plt.plot(df['rating'], label='Original')
    plt.plot(fit.fittedvalues, label='Fitted')
    plt.plot(forecast, label='Forecast')
    plt.legend()
    plt.show()

time_series_analysis(disney_pplus_titles, release_year_column)
```



In [15]:
```
# Download VADER lexicon
nltk.download('vader_lexicon')
```

```
[nltk_data] Error loading vader_lexicon: <urlopen error [Errno 11001]
[nltk_data]     getaddrinfo failed>
```

Out[15]: False

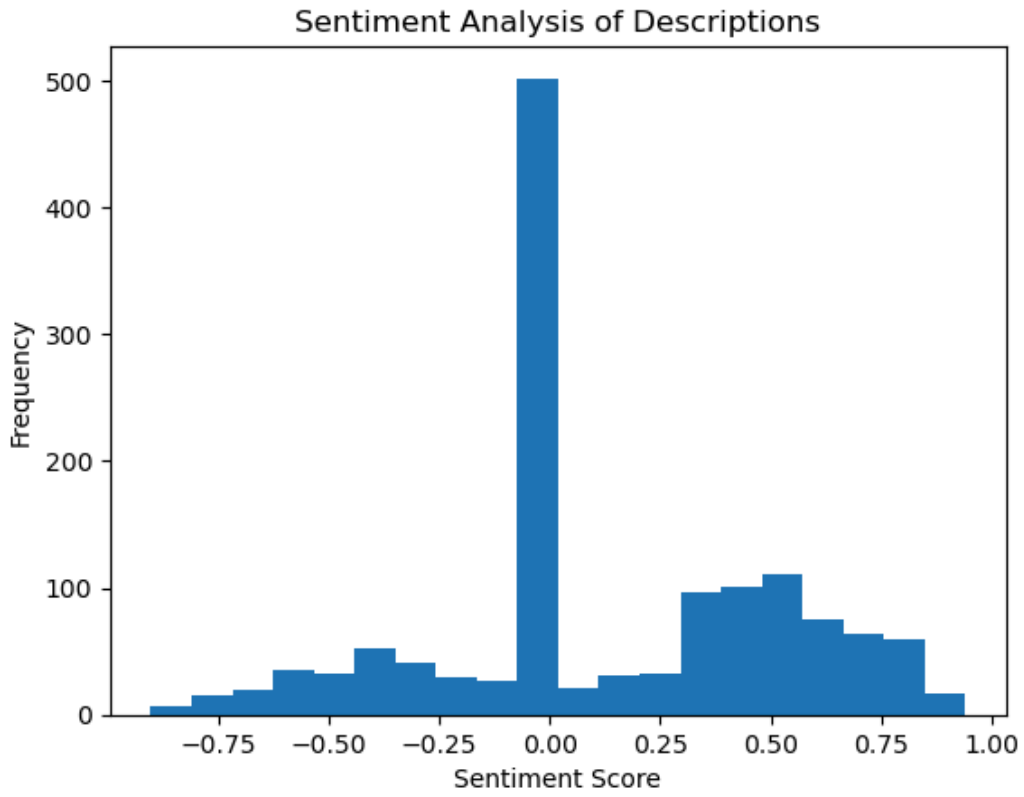
In [16]:

```
# Sentiment Analysis
def sentiment_analysis(df):
    sia = SentimentIntensityAnalyzer()

    df['sentiment'] = df['description'].apply(lambda x: sia.polarity_scores(x)['compoun

    plt.hist(df['sentiment'], bins=20)
    plt.title('Sentiment Analysis of Descriptions')
    plt.xlabel('Sentiment Score')
    plt.ylabel('Frequency')
    plt.show()

sentiment_analysis(disney_pplus_titles)
```



In [17]:

```
# Clustering/Classification
def clustering_classification(df):
    tfidf = TfidfVectorizer(stop_words='english')
    X = tfidf.fit_transform(df['description'].fillna(''))

    kmeans = KMeans(n_clusters=5, random_state=42)
    clusters = kmeans.fit_predict(X)

    pca = PCA(n_components=2)
    principal_components = pca.fit_transform(X.toarray())

    plt.scatter(principal_components[:, 0], principal_components[:, 1], c=clusters, cma
    plt.title('KMeans Clustering of Descriptions')
    plt.show()

clustering_classification(disney_pplus_titles)
```

```
D:\python\New folder\lib\site-packages\sklearn\cluster\_kmeans.py:870: FutureWarning:
The default value of `n_init` will change from 10 to 'auto' in 1.4. Set the value of `
n_init` explicitly to suppress the warning
  warnings.warn(
```