```
In [1]:
import numpy as np
import pandas as pd
import seaborn as sns
from matplotlib import pyplot as plt
plt.style.use('fivethirtyeight')

#Modules for ML(Recommendation)
from sklearn.preprocessing import MinMaxScaler
from sklearn.neighbors import NearestNeighbors
from sklearn.metrics.pairwise import cosine_similarity

%matplotlib inline
```

```
In [2]:
df = pd.read_csv('top100_kdrama.csv')
df.shape
```

Out[2]: (100, 14)

```
In [3]:
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 100 entries, 0 to 99
Data columns (total 14 columns):
 #   Column             Non-Null Count  Dtype
---  ------             --------------  -----
 0   Name               100 non-null    object
 1   Year of release    100 non-null    int64
 2   Aired Date         100 non-null    object
 3   Aired On           100 non-null    object
 4   Number of Episode  100 non-null    int64
 5   Network            100 non-null    object
 6   Duration           100 non-null    object
 7   Content Rating     100 non-null    object
 8   Synopsis           100 non-null    object
 9   Cast               100 non-null    object
 10  Genre              100 non-null    object
 11  Tags               100 non-null    object
 12  Rank               100 non-null    object
 13  Rating             100 non-null    float64
dtypes: float64(1), int64(2), object(11)
memory usage: 11.1+ KB
```

```
In [11]:
synopsis = pd.read_csv('top100_kdrama.csv',usecols=['Synopsis'])
synopsis.head()
```

Out[11]:

	Synopsis
0	Geu Roo is a young autistic man. He works for ...
1	The stories of people going through their days...
2	Although Baek Hee Sung is hiding a dark secret...
3	Everyday is extraordinary for five doctors and...
4	Park Dong Hoon is a middle-aged engineer who i...

```
In [12]:
df.head()
```

Out[12]:

	Name	Year of release	Aired Date	Aired On	Number of Episode	Network	Duration	Content Rating	Synopsis	Cast	Genre	Tags
0	Move to Heaven	2021	May 14, 2021	Friday	10	Netflix	52 min.	18+ Restricted (violence & profanity)	Geu Roo is a young autistic man. He works for ...	Lee Je Hoon, Tang Jun Sang, Hong Seung Hee, Ju...	Life, Drama, Family	Autism, Uncle Nephew Relationship, Death, Sava..
1	Hospital Playlist	2020	Mar 12, 2020 - May 28, 2020	Thursday	12	Netflix, tvN	1 hr. 30 min.	15+ - Teens 15 or older	The stories of people going through their days...	Jo Jung Suk, Yoo Yeon Seok, Jung Kyung Ho, Kim...	Friendship, Romance, Life, Medical	Strong Friendship, Multiple Mains, Bes Friend..
2	Flower of Evil	2020	Jul 29, 2020 - Sep 23, 2020	Wednesday, Thursday	16	tvN	1 hr. 10 min.	15+ - Teens 15 or older	Although Baek Hee Sung is hiding a dark secret...	Lee Joon Gi, Moon Chae Won, Jang Hee Jin, Seo ...	Thriller, Romance, Crime, Melodrama	Married Couple, Deception, Suspense, Family Se..
3	Hospital Playlist	2021	Jun 17, 2021 - Sep	Thursday	12	Netflix, tvN	1 hr. 40 min.	15+ - Teens 15	Everyday is extraordinary for five	Jo Jung Suk, Yoo Yeon Seok,	Friendship, Romance,	Workplace, Strong Friendship, Bes

```
In [13]:
kdrama_names = df[['Name']]
kdrama_names.head()
```

Out[13]:

	Name
0	Move to Heaven
1	Hospital Playlist
2	Flower of Evil
3	Hospital Playlist 2
4	My Mister

```
In [14]:
cols_for_recommend = ['Year of release', 'Number of Episode', 'Network', 'Duration', 'Conten
t Rating', 'Rating']
df = df[cols_for_recommend]
df.head()
```

Out[14]:

	Year of release	Number of Episode	Network	Duration	Content Rating	Rating
0	2021	10	Netflix	52 min.	18+ Restricted (violence & profanity)	9.2
1	2020	12	Netflix, tvN	1 hr. 30 min.	15+ - Teens 15 or older	9.1
2	2020	16	tvN	1 hr. 10 min.	15+ - Teens 15 or older	9.1
3	2021	12	Netflix, tvN	1 hr. 40 min.	15+ - Teens 15 or older	9.1
4	2018	16	tvN	1 hr. 17 min.	15+ - Teens 15 or older	9.1

```
In [15]:
networks = []
[networks.append(list(set(network.replace(' ','').split(',')))[0]) for network in df['Networ
k']]
networks[:5]
```

Out[15]: ['Netflix', 'tvN', 'tvN', 'tvN', 'tvN']

```
In [16]:
df['Network'] = networks
df['Network'].unique()
```

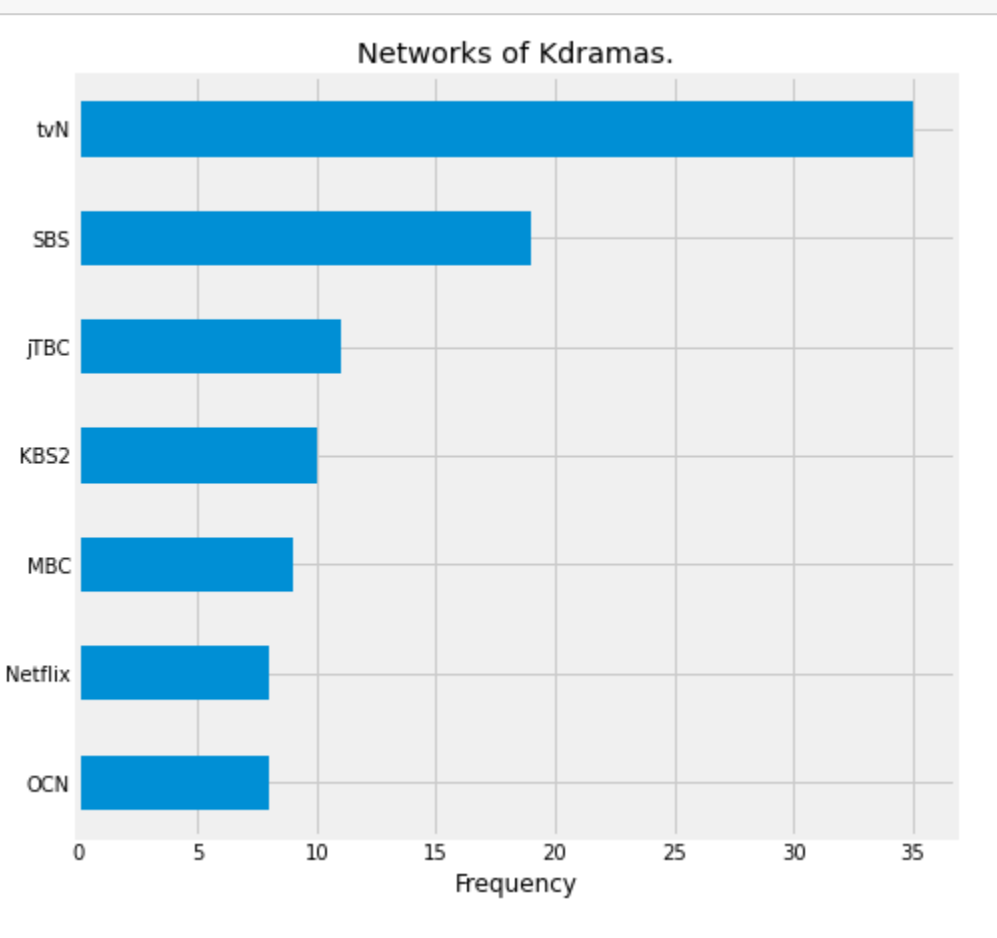
```
Out[16]: array(['Netflix', 'tvN', 'jTBC', 'KBS2', 'OCN', 'SBS', 'MBC'],
      dtype=object)
```

```
In [17]:
plt.figure(figsize=(7,7))

df['Network'].value_counts().plot(kind='barh')

plt.gca().invert_yaxis()
plt.title("Networks of Kdramas.")
plt.xlabel('Frequency')
plt.show()

df['Network'].value_counts()
```




```
Out[17]:
tvN        35
SBS        19
jTBC       11
KBS2       10
MBC         9
Netflix     8
OCN         8
Name: Network, dtype: int64
```

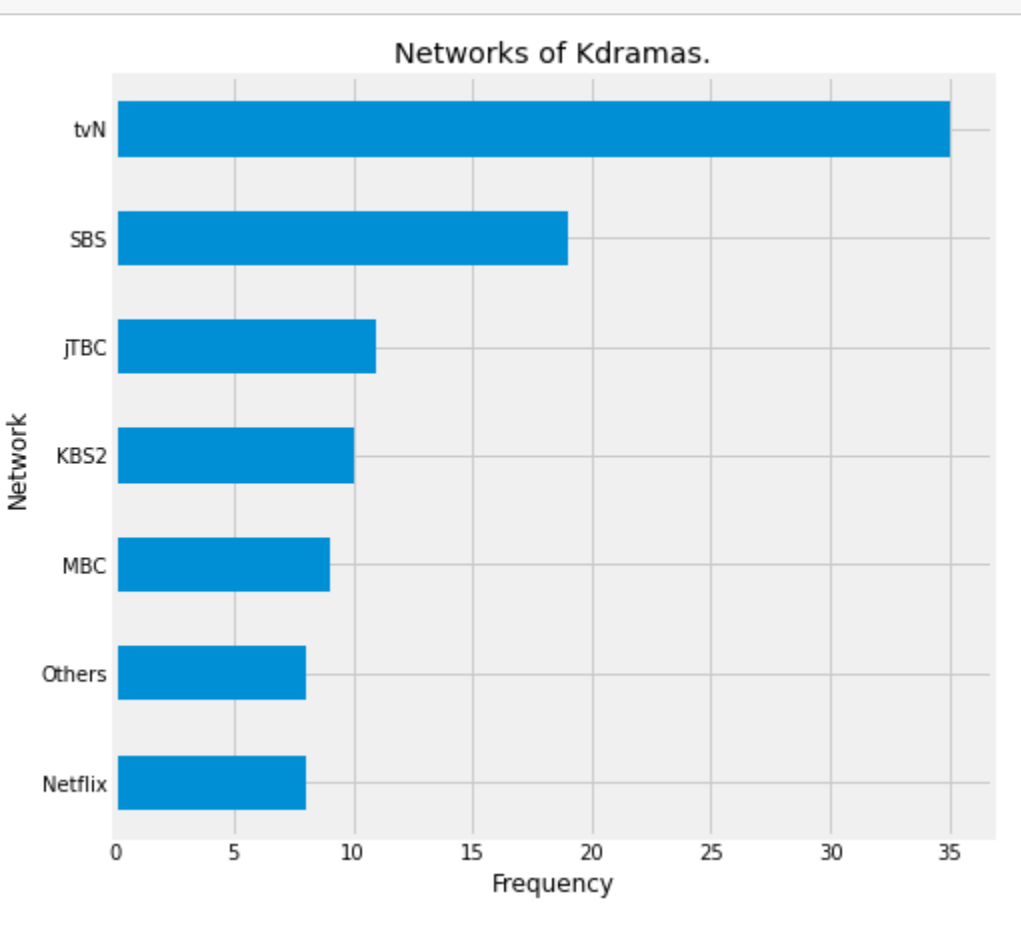
```
In [18]:
df['Network'].replace(['OCN','Viki'],['Others','Others'],inplace=True)
```

```
In [19]:
plt.figure(figsize=(7,7))

df['Network'].value_counts().plot(kind='barh')

plt.gca().invert_yaxis()
plt.title("Networks of Kdramas.")
plt.xlabel('Frequency')
plt.ylabel('Network')
plt.show()

df['Network'].value_counts()
```




```
Out[19]:
tvN        35
SBS        19
jTBC       11
KBS2       10
MBC         9
Others      8
Netflix     8
Name: Network, dtype: int64
```

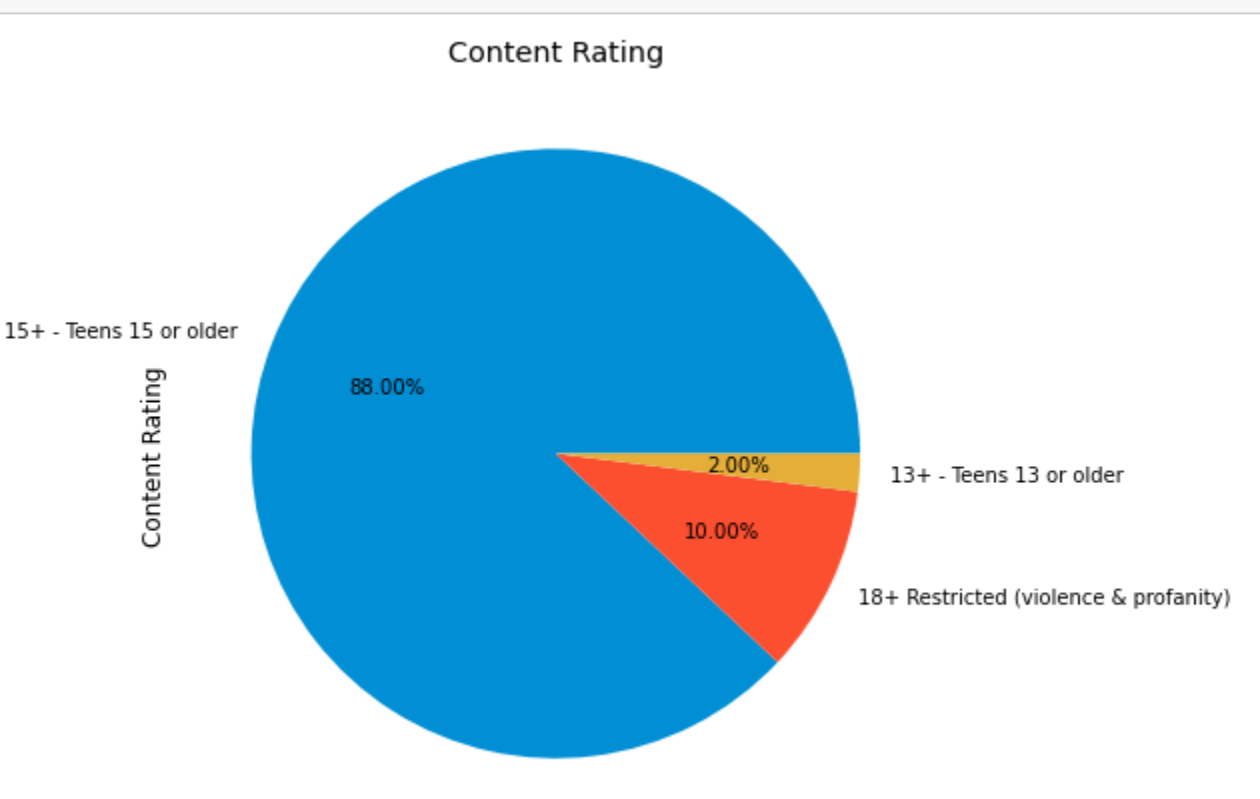
```
In [20]:
df['Duration'] = df['Duration'].str.replace('[A-Za-z]\D+','',regex=True)
df['Duration'].head()
```

```
Out[20]:
0      52
1    1 30
2    1 10
3    1 40
4    1 17
Name: Duration, dtype: object
```

```
In [21]:
df['Duration'] = df['Duration'].str.replace(' ','',regex=True)
df['Duration'] = pd.to_numeric(df['Duration'])
df['Duration'].head()
```

```
Out[21]:
0     52
1    130
2    110
3    140
4    117
Name: Duration, dtype: int64
```

```
In [22]:
plt.figure(figsize=(7,7))
df['Content Rating'].value_counts().plot(kind='pie',autopct='%.2f%%')
plt.title("Content Rating")
plt.show()
```




```
In [23]:
df['Content Rating'].value_counts()
```

```
Out[23]:
15+ - Teens 15 or older                  88
18+ Restricted (violence & profanity)    10
13+ - Teens 13 or older                   2
Name: Content Rating, dtype: int64
```

```
In [24]:
df[['Rating']].describe()
```

Out[24]:

	Rating
count	100.000000
mean	8.723000
std	0.174573
min	8.500000
25%	8.600000
50%	8.700000
75%	8.800000
max	9.200000

```
In [25]:
df.head()
```

Out[25]:

	Year of release	Number of Episode	Network	Duration	Content Rating	Rating
0	2021	10	Netflix	52	18+ Restricted (violence & profanity)	9.2
1	2020	12	tvN	130	15+ - Teens 15 or older	9.1
2	2020	16	tvN	110	15+ - Teens 15 or older	9.1
3	2021	12	tvN	140	15+ - Teens 15 or older	9.1
4	2018	16	tvN	117	15+ - Teens 15 or older	9.1

```
In [26]:
cols_to_encode = ['Network','Content Rating']
dummies = pd.get_dummies(df[cols_to_encode],drop_first=True)
dummies.head()
```

Out[26]:

	Network_MBC	Network_Netflix	Network_Others	Network_SBS	Network_jTBC	Network_tvN	Content Rating_15+ - Teens 15 or older	Content Rating_18+ Restricted (violence & profanity)
0	0	1	0	0	0	0	0	1
1	0	0	0	0	0	1	1	0
2	0	0	0	0	0	1	1	0
3	0	0	0	0	0	1	1	0

```
In [27]:
df.drop(cols_to_encode, axis=1,inplace=True)
df.head()
```

Out[27]:

	Year of release	Number of Episode	Duration	Rating
0	2021	10	52	9.2
1	2020	12	130	9.1
2	2020	16	110	9.1
3	2021	12	140	9.1
4	2018	16	117	9.1

```
In [28]:
scale = MinMaxScaler()
scalled = scale.fit_transform(df)
```

```
In [29]:
i=0
for col in df.columns:
    df[col] = scalled[:,i]
    i += 1
```

```
In [30]:
df.head()
```

Out[30]:

	Year of release	Number of Episode	Duration	Rating
0	1.000000	0.042553	0.312500	1.000000
1	0.944444	0.063830	0.921875	0.857143
2	0.944444	0.106383	0.765625	0.857143
3	1.000000	0.063830	1.000000	0.857143
4	0.833333	0.106383	0.820312	0.857143

```
In [31]:
new_df = pd.concat([df, dummies],axis=1)
new_df.shape
```

Out[31]: (100, 12)

```
In [32]:
new_df.head()
```

Out[32]:

	Year of release	Number of Episode	Duration	Rating	Network_MBC	Network_Netflix	Network_Others	Network_SBS	Network_jTBC
0	1.000000	0.042553	0.312500	1.000000	0	1	0	0	0
1	0.944444	0.063830	0.921875	0.857143	0	0	0	0	0
2	0.944444	0.106383	0.765625	0.857143	0	0	0	0	0
3	1.000000	0.063830	1.000000	0.857143	0	0	0	0	0
4	0.833333	0.106383	0.820312	0.857143	0	0	0	0	0

```
In [33]:
kdrama_names['Name'].loc[23]='kingdom'
```

```
In [34]:
new_df.index = [drama for drama in kdrama_names['Name']]
synopsis.index = [drama for drama in kdrama_names['Name']]
```

```
In [35]:
new_df.head()
```

Out[35]:

	Year of release	Number of Episode	Duration	Rating	Network_MBC	Network_Netflix	Network_Others	Network_SBS
Move to Heaven	1.000000	0.042553	0.312500	1.000000	0	1	0	0
Hospital Playlist	0.944444	0.063830	0.921875	0.857143	0	0	0	0
Flower of Evil	0.944444	0.106383	0.765625	0.857143	0	0	0	0
Hospital Playlist 2	1.000000	0.063830	1.000000	0.857143	0	0	0	0
My Mister	0.833333	0.106383	0.820312	0.857143	0	0	0	0

```
In [36]:
def getRecommendation_dramas_for(drama_name,no_of_recommend=5,get_similarity_rate=False):

    kn = NearestNeighbors(n_neighbors=no_of_recommend+1,metric='manhattan')
    kn.fit(new_df)

    distances, indices = kn.kneighbors(new_df.loc[drama_name])

    print(f'Similar K-Dramas for "{drama_name[0]}":')
    nearest_dramas = [kdrama_names.loc[i][0] for i in indices.flatten()][1:]
    if not get_similarity_rate:
        return nearest_dramas
    sim_rates = []
    synopsis_ = []
    for drama in nearest_dramas:
        synopsis_.append(synopsis.loc[drama][0])
        sim = cosine_similarity(new_df.loc[drama_name],[new_df.loc[drama]]).flatten()
        sim_rates.append(sim[0])
    recommended_dramas = pd.DataFrame({'Recommended Drama':nearest_dramas,'Similarity':sim_r
ates,'Synopsis':synopsis_})
    recommended_dramas.sort_values(by='Similarity',ascending=True)
    return recommended_dramas
```

```
In [37]:
kdrama = kdrama_names.loc[0]
kdrama
```

```
Out[37]:
Name    Move to Heaven
Name: 0, dtype: object
```

```
In [38]:
getRecommendation_dramas_for(kdrama,no_of_recommend=5)
```

Similar K-Dramas for "Move to Heaven":

Out[38]: ['Kingdom', 'Kingdom', 'My Name', 'Sweet Home', 'Squid Game']

```
In [39]:
rd2 = kdrama_names.loc[10]
rd2
```

```
Out[39]:
Name    Signal
Name: 10, dtype: object
```

```
In [40]:
getRecommendation_dramas_for(rd2,get_similarity_rate=True)
```

Similar K-Dramas for "Signal":

Out[40]:

	Recommended Drama	Similarity	Synopsis
0	It's Okay to Not Be Okay	0.994766	Moon Gang Tae is a community health worker at ...
1	Stranger	0.996784	Hwang Shi Mok underwent brain surgery as a chi...
2	Crash Landing on You	0.996966	After getting into a paragliding accident, Sou...
3	My Mister	0.997236	Park Dong Hoon is a middle-aged engineer who i...
4	Reply 1988	0.995079	Five childhood friends, who all live in the sa...

```
In [41]:
rd3 = kdrama_names.loc[1]
rd3
```

```
Out[41]:
Name    Hospital Playlist
Name: 1, dtype: object
```

```
In [43]:
getRecommendation_dramas_for(rd3,get_similarity_rate=True)
```

Similar K-Dramas for "Hospital Playlist":

Out[43]:

	Recommended Drama	Similarity	Synopsis
0	Hospital Playlist 2	0.999395	Everyday is extraordinary for five doctors and...
1	Flower of Evil	0.997420	Although Baek Hee Sung is hiding a dark secret...
2	Prison Playbook	0.996988	Kim Je Hyuk, a famous baseball player, is arre...
3	My Mister	0.998064	Park Dong Hoon is a middle-aged engineer who i...
4	Crash Landing on You	0.997901	After getting into a paragliding accident, Sou...

```
In [44]:
def print_similiar_drama_Synopsis(recommended_df):
    rdf = recommended_df
    rdf_cols = rdf['Synopsis']
    dramas = rdf['Recommended Drama']
    for i in range(5):
        print(dramas[i])
        print(rdf_cols[i])
        print('\n')
```

```
In [45]:
rd4 = kdrama_names.loc[8]
rd4
```

```
Out[45]:
Name    Mr. Queen
Name: 8, dtype: object
```

```
In [46]:
rdf4 = getRecommendation_dramas_for(rd4,no_of_recommend=10,get_similarity_rate=True)
print_similiar_drama_Synopsis(rdf4)
```

```
Similar K-Dramas for "Mr. Queen":
It's Okay to Not Be Okay
Moon Gang Tae is a community health worker at a psychiatric ward who was blessed with everyth
ing including a great body, smarts, ability to sympathize with others, patience, ability to r
eact quickly, stamina, and more. Meanwhile, Ko Moon Young is a popular writer of children’s l
iterature who, due to suffering from an antisocial personality disorder, seems extremely self
ish, arrogant, and rude.


Vincenzo
At the age of eight, Park Joo Hyeong went to Italy after being adopted. Now an adult, he is k
nown as Vincenzo Cassano to the Mafia, who employ him as a consigliere. Because mafia faction
s are at war with each other, he flees to South Korea, where he gets involved with Lawyer Hon
g Cha Young. She is the type of attorney who will do anything to win a case. Now back at his
motherland, he gives an unrivaled conglomerate a taste of its own medicine with a side of jus
tice.


Crash Landing on You
After getting into a paragliding accident, South Korean heiress Yoon Se Ri crash lands in Nor
th Korea. There, she meets North Korean army officer Ri Jung Hyuk, who agrees to help her ret
urn to South Korea. Despite the tension between their countries, the two of them start fallin
g for one another.


Flower of Evil
Although Baek Hee Sung is hiding a dark secret surrounding his true identity, he has establis
hed a happy family life and a successful career. He is a loving husband and doting father to
his young daughter. But his perfect façade begins to crumble when his wife, Cha Ji Won, a hom
icide detective, begins investigating a string of serial murders from 15 years ago. Ji Won no
tices changes in Hee Sung’s behavior and begins to wonder if he could possibly be hiding some
thing from her.


Mr. Sunshine
Mr. Sunshine centers on a young boy born into a house servant's family and travels to the Uni
ted States during the 1871 Shinmiyangyo (U.S. expedition to Korea). He returns to his homelan
```

```
In [47]:
rd5 = kdrama_names.loc[99]
rd5
```

```
Out[47]:
Name    Fight For My Way
Name: 99, dtype: object
```

```
In [48]:
getRecommendation_dramas_for(rd5,no_of_recommend=5,get_similarity_rate=True)
```

Similar K-Dramas for "Fight For My Way":

Out[48]:

	Recommended Drama	Similarity	Synopsis
0	Good Manager	0.993771	Can corporate politics turn a bad person into ...
1	Descendants of the Sun	0.975878	A love story that develops between a surgeon a...
2	Dali and the Cocky Prince	0.956293	As a young boy, Moo Hak grew up in the market ...
3	Go Back Couple	0.962434	38-years-old married couple, Choi Ban Do and M...
4	Healer	0.902002	Seo Jung Hoo is a special kind of night courie...

In [ ]: