cob-phase-2

February 12, 2024

0.0.1 1. Analyze the dataset and create graphs using seaborn and matplotlib.Dataset:

Import Necessary Libraries:

[1]:

```
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
```

[2]:

```
# Load the dataset
df = pd.read_csv('/content/dataset - netflix1.csv')
df.head()
```

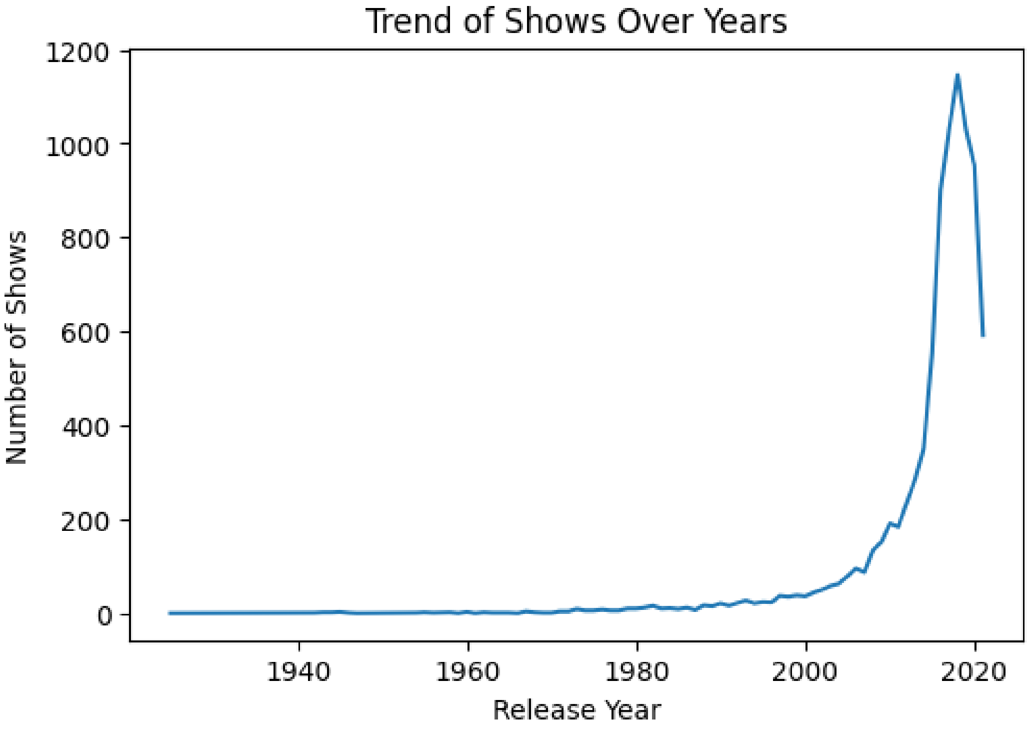
[2]:

```
  show_id     type                             title         director  \
0      s1    Movie              Dick Johnson Is Dead  Kirsten Johnson
1      s3  TV Show                         Ganglands  Julien Leclercq
2      s6  TV Show                     Midnight Mass    Mike Flanagan
3     s14    Movie  Confessions of an Invisible Girl    Bruno Garotti
4      s8    Movie                           Sankofa     Haile Gerima

         country date_added  release_year rating  duration  \
0  United States  9/25/2021          2020  PG-13    90 min
1         France  9/24/2021          2021  TV-MA  1 Season
2  United States  9/24/2021          2021  TV-MA  1 Season
3         Brazil  9/22/2021          2021  TV-PG    91 min
4  United States  9/24/2021          1993  TV-MA   125 min

                                           listed_in
0                                      Documentaries
1  Crime TV Shows, International TV Shows, TV Act…
2                 TV Dramas, TV Horror, TV Mysteries
3                 Children & Family Movies, Comedies
4   Dramas, Independent Movies, International Movies
```

Trend of Shows Over Years:

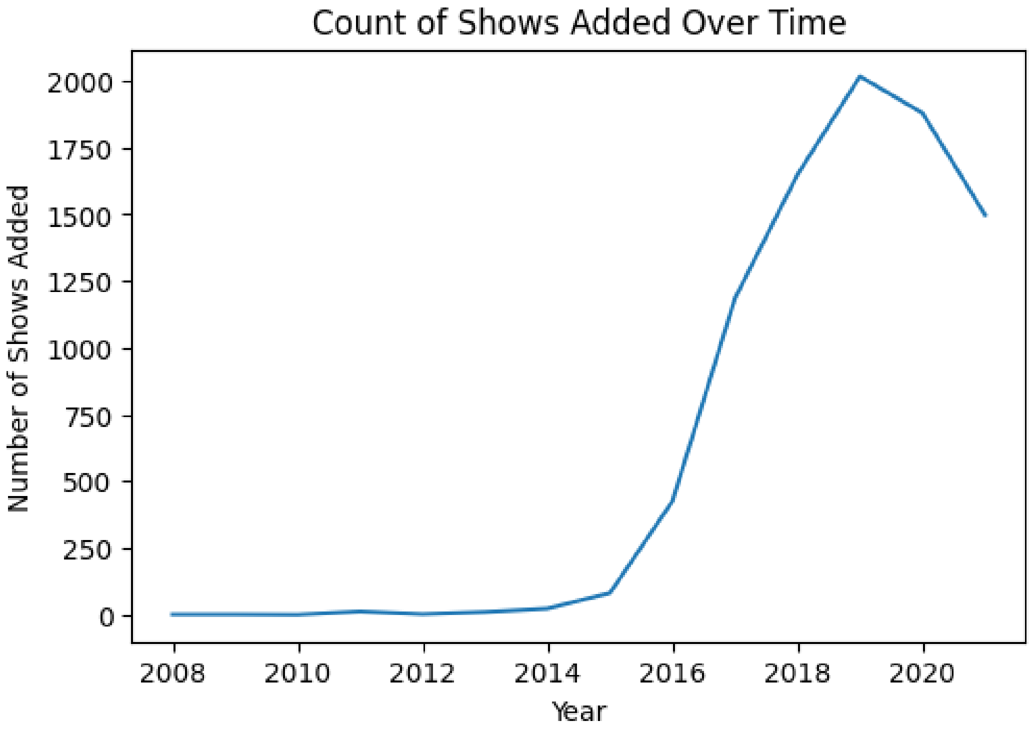
[3]:

```
plt.figure(figsize=(6, 4))
sns.lineplot(data=df.groupby('release_year').size())
plt.title('Trend of Shows Over Years')
plt.xlabel('Release Year')
plt.ylabel('Number of Shows')
plt.show()
```



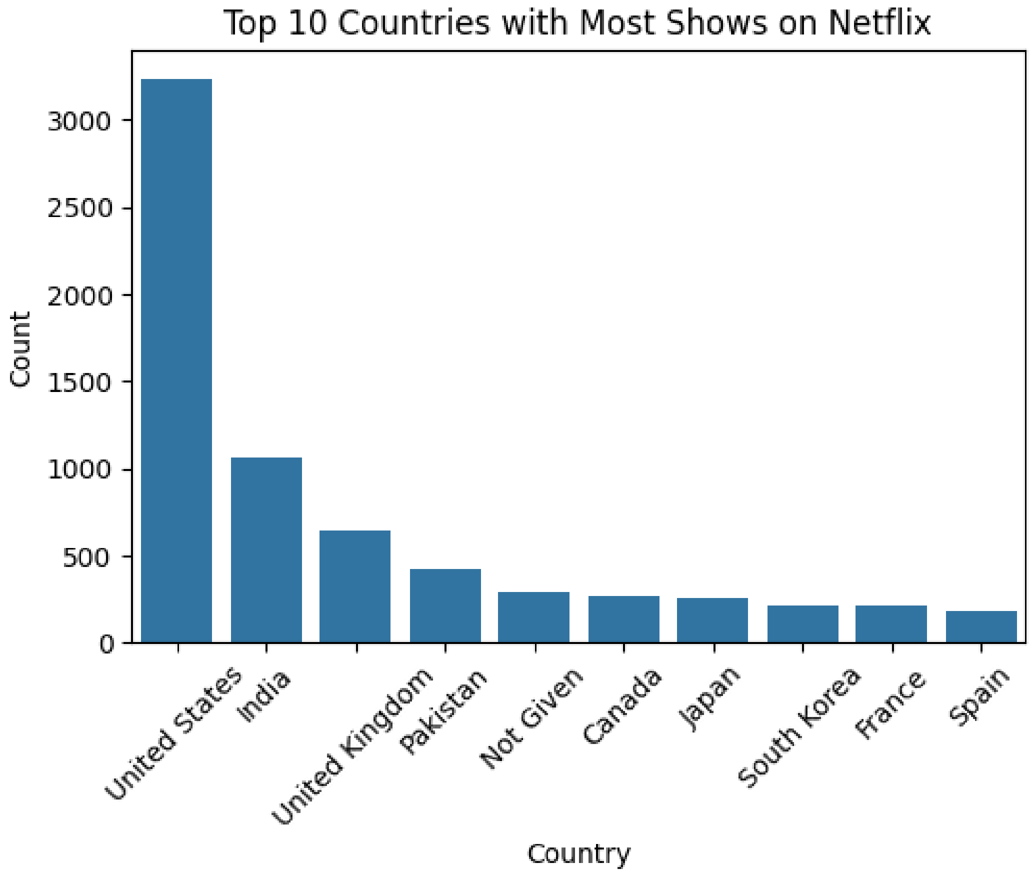
Count of Shows Added Over Time:

```
[4]: df['date_added'] = pd.to_datetime(df['date_added'])
     plt.figure(figsize=(6, 4))
     sns.lineplot(data=df.groupby(df['date_added'].dt.year).size())
     plt.title('Count of Shows Added Over Time')
     plt.xlabel('Year')
     plt.ylabel('Number of Shows Added')
     plt.show()
```



Count of Shows by Country:

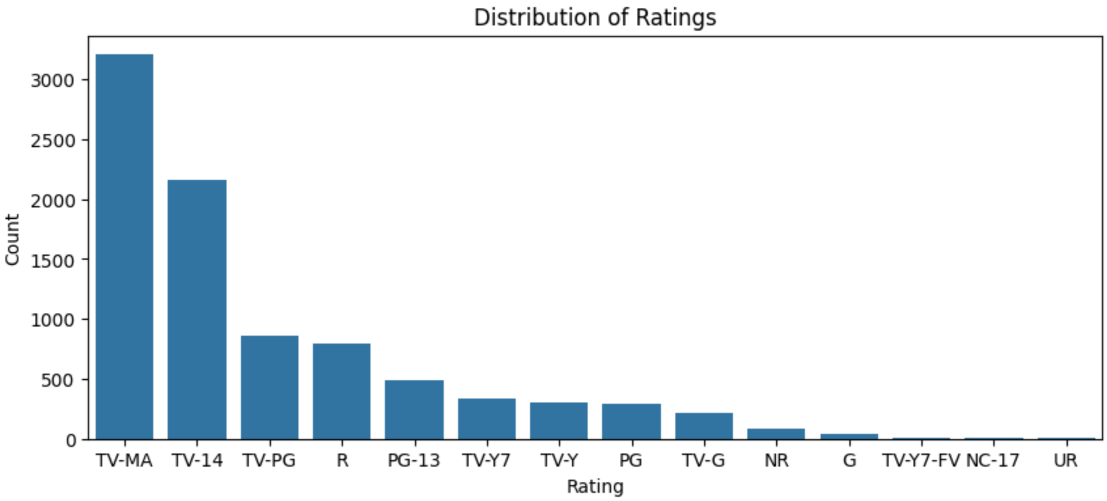
[5]:
```
plt.figure(figsize=(6, 4))
sns.countplot(data=df, x='country', order=df['country'].value_counts().index[:
  ↪10])
plt.xticks(rotation=45)
plt.title('Top 10 Countries with Most Shows on Netflix')
plt.xlabel('Country')
plt.ylabel('Count')
plt.show()
```



Distribution of Ratings:

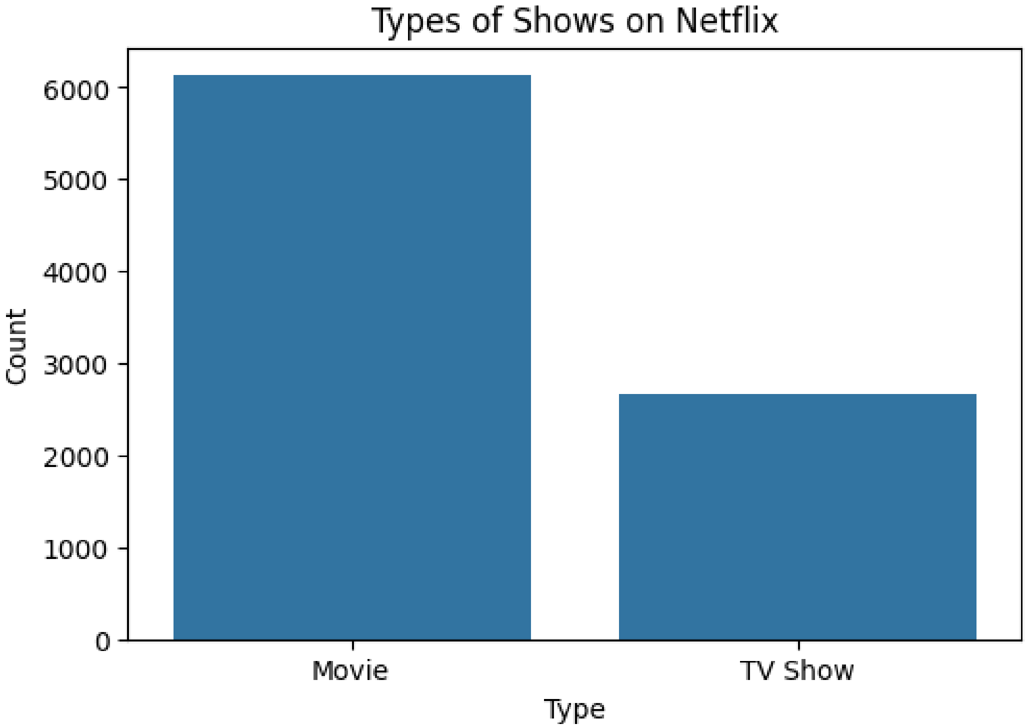
[6]:

```
plt.figure(figsize=(10, 4))
sns.countplot(data=df, x='rating', order=df['rating'].value_counts().index)
plt.title('Distribution of Ratings')
plt.xlabel('Rating')
plt.ylabel('Count')
plt.show()
```



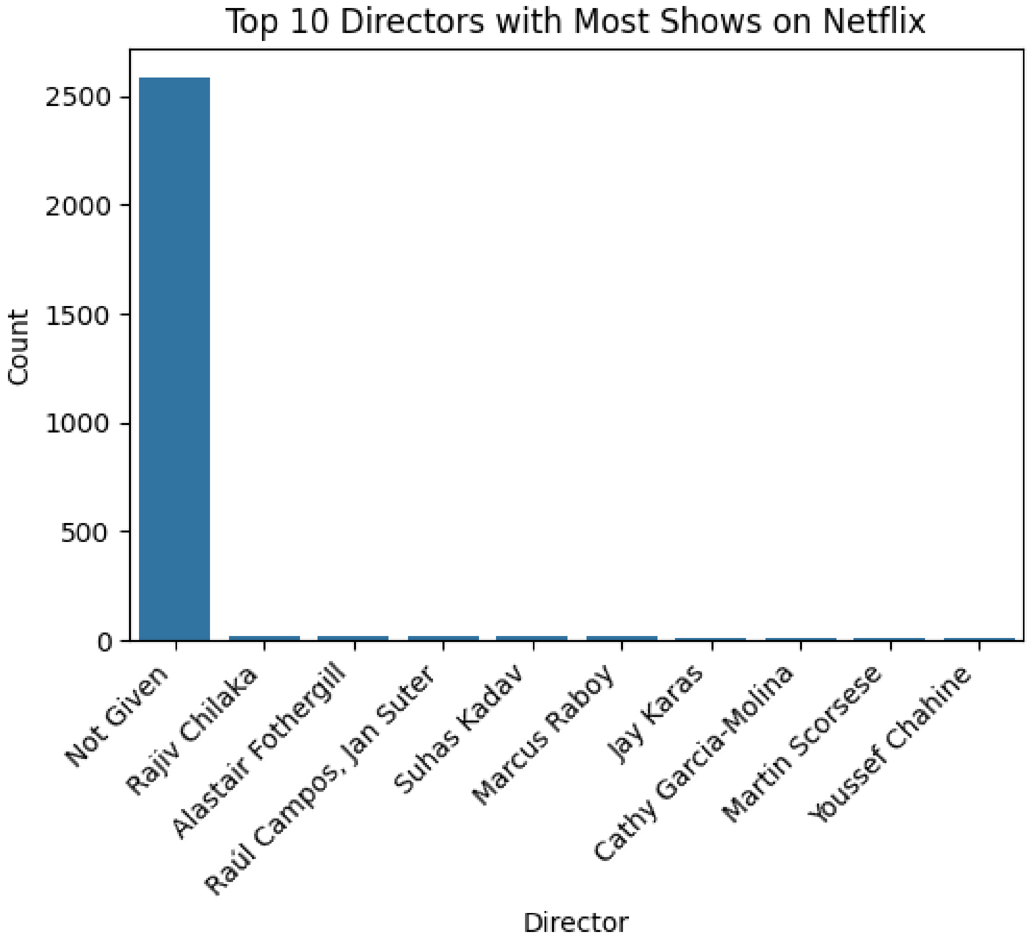
Types of Shows:

[7]:
```
plt.figure(figsize=(6, 4))
sns.countplot(data=df, x='type')
plt.title('Types of Shows on Netflix')
plt.xlabel('Type')
plt.ylabel('Count')
plt.show()
```



Top Directors with Most Shows:

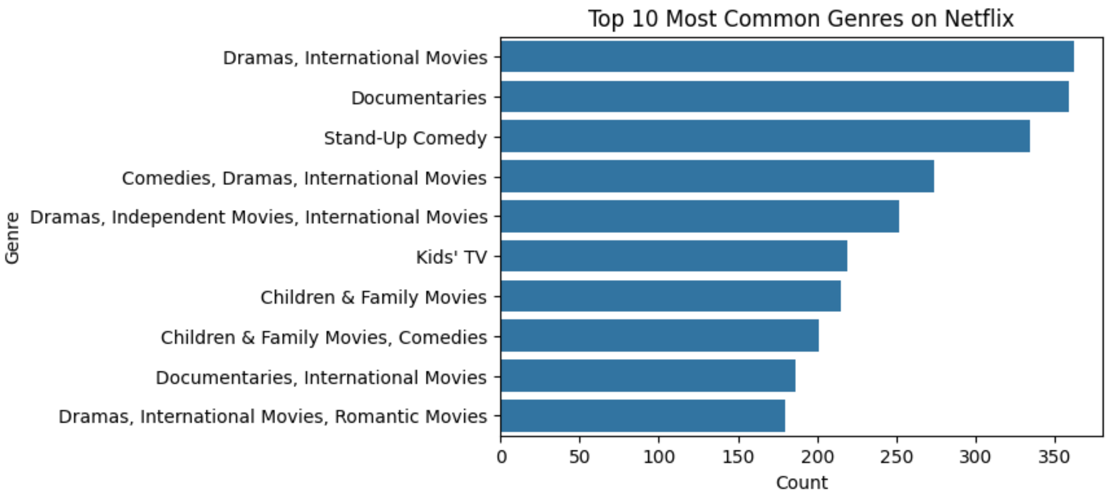
```
[8]: plt.figure(figsize=(6, 4))
     sns.countplot(data=df, x='director', order=df['director'].value_counts().index[:
       ↪10])
     plt.xticks(rotation=45)
     plt.title('Top 10 Directors with Most Shows on Netflix')
     plt.xlabel('Director')
     plt.ylabel('Count')
     plt.xticks(rotation=45, ha = 'right')
     plt.show()
```



Most Common Genres:

[9]:

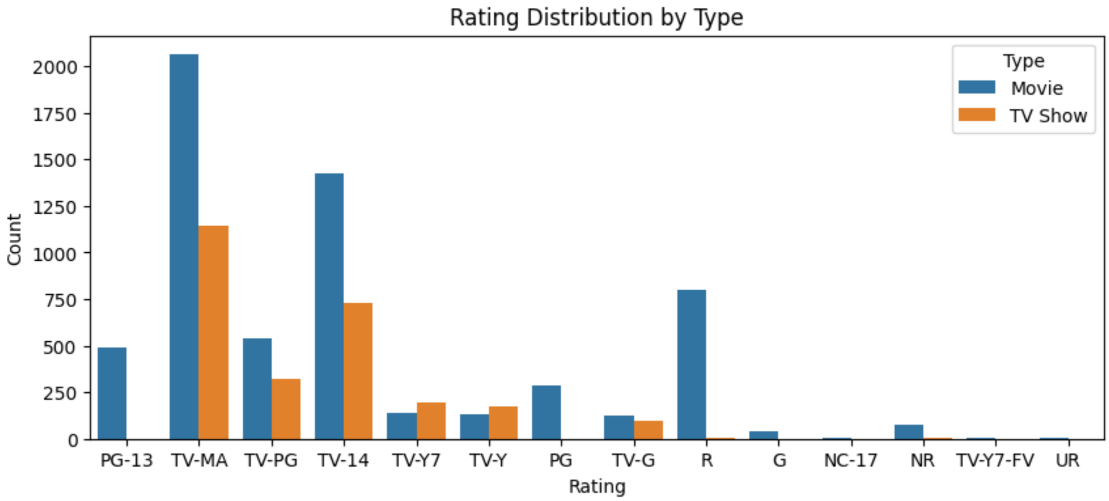
```
plt.figure(figsize=(6, 4))
sns.countplot(data=df, y='listed_in', order=df['listed_in'].value_counts().
 ↪index[:10])
plt.title('Top 10 Most Common Genres on Netflix')
plt.xlabel('Count')
plt.ylabel('Genre')
plt.show()
```



Rating Distribution by Type:

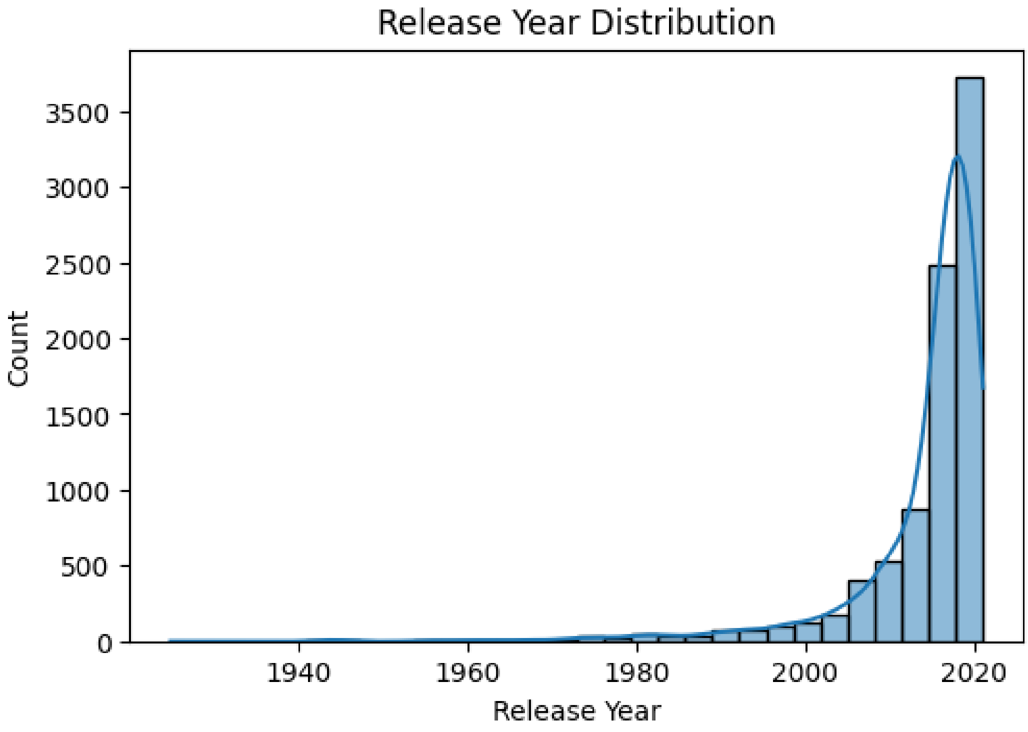
[10]:

```
plt.figure(figsize=(10, 4))
sns.countplot(data=df, x='rating', hue='type')
plt.title('Rating Distribution by Type')
plt.xlabel('Rating')
plt.ylabel('Count')
plt.legend(title='Type')
plt.show()
```



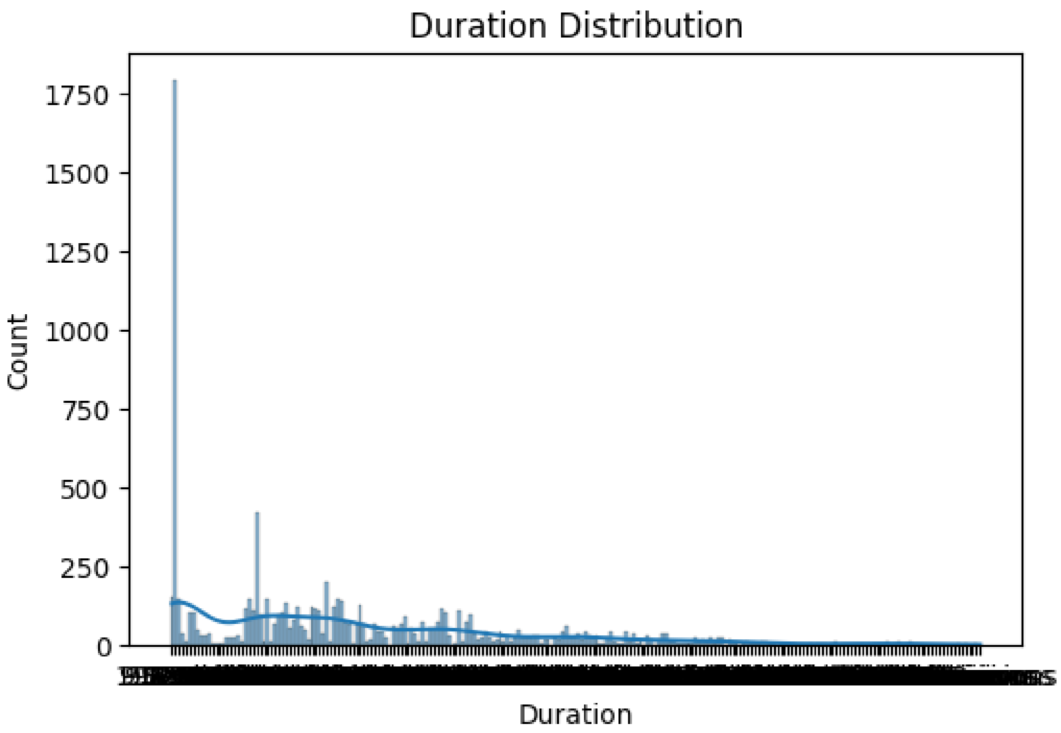
Release Year Distribution:

[11]:
```python
plt.figure(figsize=(6, 4))
sns.histplot(data=df, x='release_year', bins=30, kde=True)
plt.title('Release Year Distribution')
plt.xlabel('Release Year')
plt.ylabel('Count')
plt.show()
```



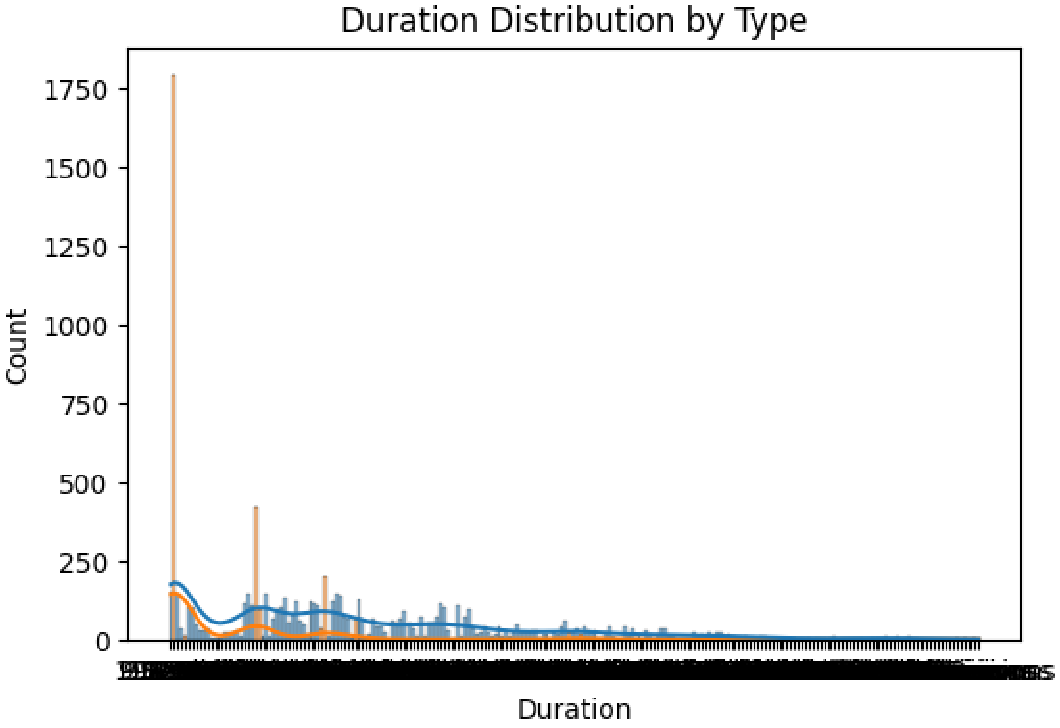
Duration Distribution:

[12]:
```python
plt.figure(figsize=(6, 4))
sns.histplot(data=df, x='duration', bins=30, kde=True)
plt.title('Duration Distribution')
plt.xlabel('Duration')
plt.ylabel('Count')
plt.show()
```



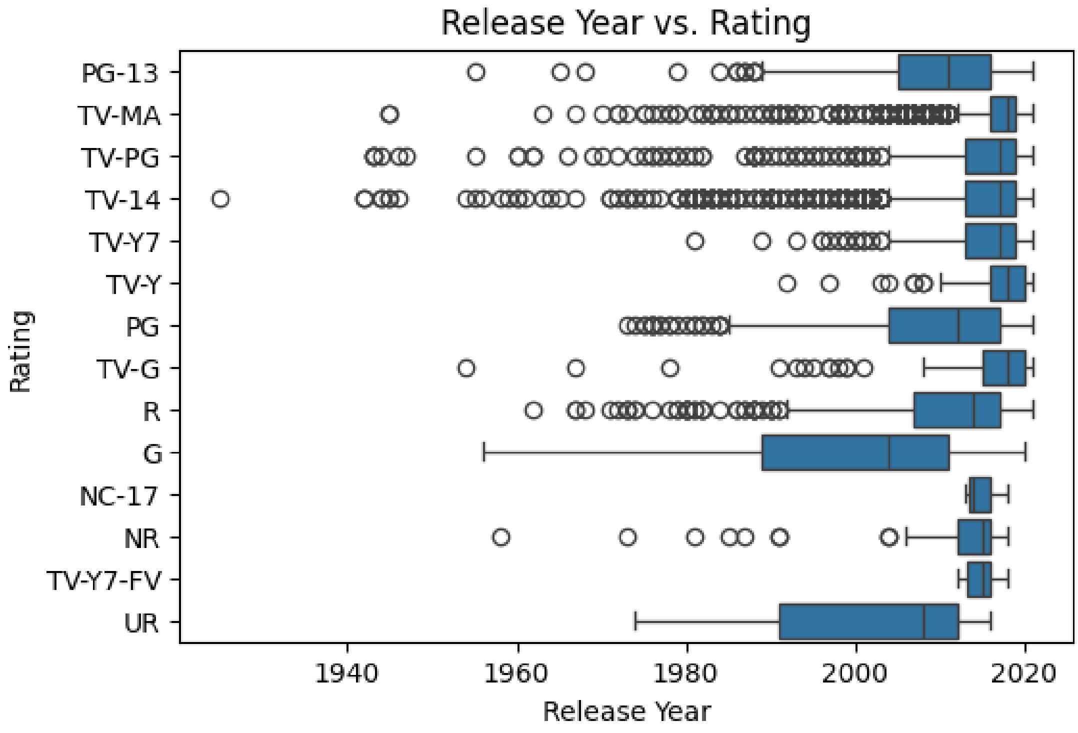
Duration Distribution by Type:

[13]:
```python
plt.figure(figsize=(6, 4))
sns.histplot(data=df, x='duration', bins=30, kde=True, hue='type',␣
  ↪multiple='stack', legend=False)
plt.title('Duration Distribution by Type')
plt.xlabel('Duration')
plt.ylabel('Count')
plt.show()
```



Release Year vs. Rating:

[14]:
```
plt.figure(figsize=(6, 4))
sns.boxplot(data=df, x='release_year', y='rating')
plt.title('Release Year vs. Rating')
plt.xlabel('Release Year')
plt.ylabel('Rating')
plt.show()
```



0.0.2 2. Train a simple linear regressing model on a dataset and predict the output:

Import Necessary Libraries:

```
[15]: import pandas as pd
      from sklearn.linear_model import LinearRegression
      from sklearn.metrics import mean_squared_error
      import matplotlib.pyplot as plt
```

```
[16]: train_df = pd.read_csv('/content/train dataset - train.csv')
      test_df = pd.read_csv('/content/test dataset - test.csv')
```

```
[17]: print(train_df.head())
```

```
      x          y
0  24.0  21.549452
1  50.0  47.464463
2  15.0  17.218656
3  38.0  36.586398
4  87.0  87.288984
```

```
[18]: print(test_df.head())
```

```
    x          y
```

```
0  77  79.775152
1  21  23.177279
2  22  25.609262
3  20  17.857388
4  36  41.849864
```

Inspect the dataset:

[19]:
```
print("\033[1mTrain datset:\033[0m")
train_df.dtypes
```

```
Train datset:
```

[19]:
```
x    float64
y    float64
dtype: object
```

[20]:
```
print("\033[1mTest datset:\033[0m")
test_df.dtypes
```

```
Test datset:
```

[20]:
```
x      int64
y    float64
dtype: object
```

[21]:
```
print(train_df.isnull().sum())
print(test_df.isnull().sum())
```

```
x    0
y    1
dtype: int64
x    0
y    0
dtype: int64
```

[22]:
```
# Fill null values in the dataset with the mean of the respective columns
train_df.fillna(train_df.mean(), inplace=True)
test_df.fillna(test_df.mean(), inplace=True)
```

Split the Train and Test Datasets into Features (X) and Target (y):

[23]:
```
X_train = train_df[['x']]  # Features in the training dataset
y_train = train_df['y']    # Target in the training dataset

X_test = test_df[['x']]   # Features in the test dataset
y_test = test_df['y']     # Target in the test dataset
```

Train the Linear Regression Model:

[24]:

```
# Create a Linear Regression model
model = LinearRegression()

# Train the model on the training data
model.fit(X_train, y_train)
```

[24]:

```
LinearRegression()
```

Make Predictions on the Test Set:

[25]:

```
# Predict the output for the test set
y_pred = model.predict(X_test)
```

Evaluate the Model:

[26]:

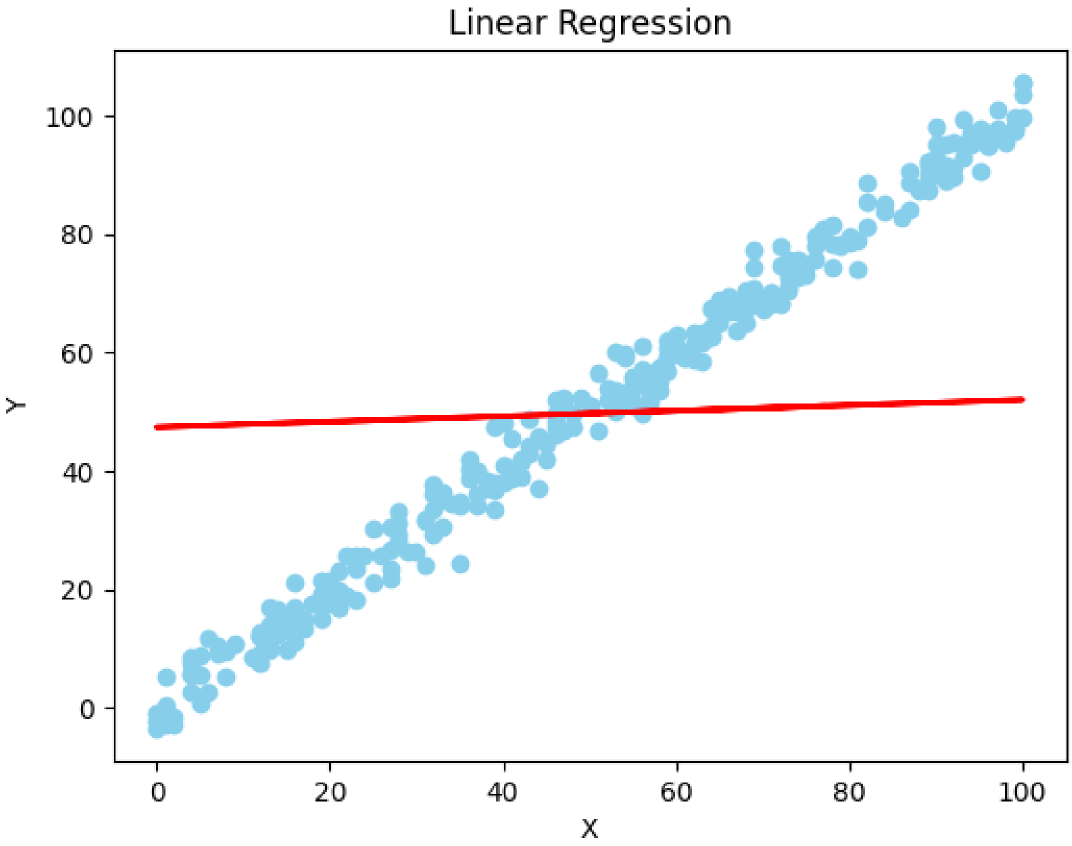
```
# Calculate the Mean Squared Error
mse = mean_squared_error(y_test, y_pred)
print(f"Mean Squared Error: {mse}")
```

```
Mean Squared Error: 770.3012816202481
```

Visualize the Regression Line:

[27]:

```
plt.scatter(X_test, y_test, color='skyblue')  # Scatter plot of the test data
plt.plot(X_test, y_pred, color='red', linewidth=2)  # Regression line
plt.title('Linear Regression')
plt.xlabel('X')
plt.ylabel('Y')
plt.show()
```


Linear Regression
100
80
60
40
20
0
Y
0
20
40
60
80
100
X