# MOVIE RATINGS ANALYSIS USING SEABORN

In [1]:
```
import pandas as pd
import os
```

In [2]:
```
movies = pd.read_csv(r'C:\Users\91939\Desktop\AI&DS\19thAug\Movie-Rating.csv')
```

In [3]:
```
movies
```

Out[3]:

| | Film | Genre | Rotten Tomatoes Ratings % | Audience Ratings % | Budget (million $) | Year of release |
|---|---|---|---|---|---|---|
| **0** | (500) Days of Summer | Comedy | 87 | 81 | 8 | 2009 |
| **1** | 10,000 B.C. | Adventure | 9 | 44 | 105 | 2008 |
| **2** | 12 Rounds | Action | 30 | 52 | 20 | 2009 |
| **3** | 127 Hours | Adventure | 93 | 84 | 18 | 2010 |
| **4** | 17 Again | Comedy | 55 | 70 | 20 | 2009 |
| **...** | ... | ... | ... | ... | ... | ... |
| **554** | Your Highness | Comedy | 26 | 36 | 50 | 2011 |
| **555** | Youth in Revolt | Comedy | 68 | 52 | 18 | 2009 |
| **556** | Zodiac | Thriller | 89 | 73 | 65 | 2007 |
| **557** | Zombieland | Action | 90 | 87 | 24 | 2009 |
| **558** | Zookeeper | Comedy | 14 | 42 | 80 | 2011 |

559 rows × 6 columns

In [4]:
```
len(movies)
```

Out[4]:
```
559
```

In [5]:
```
movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 559 entries, 0 to 558
Data columns (total 6 columns):
 #   Column                     Non-Null Count  Dtype 
---  ------                     --------------  ----- 
 0   Film                       559 non-null    object
 1   Genre                      559 non-null    object
 2   Rotten Tomatoes Ratings %  559 non-null    int64 
 3   Audience Ratings %         559 non-null    int64 
 4   Budget (million $)         559 non-null    int64 
 5   Year of release            559 non-null    int64 
dtypes: int64(4), object(2)
memory usage: 26.3+ KB
```

In [6]:
```
movies.describe()
```

Out[6]:

| | Rotten Tomatoes Ratings % | Audience Ratings % | Budget (million $) | Year of release |
|---|---|---|---|---|
| **count** | 559.000000 | 559.000000 | 559.000000 | 559.000000 |
| **mean** | 47.309481 | 58.744186 | 50.236136 | 2009.152057 |
| **std** | 26.413091 | 16.826887 | 48.731817 | 1.362632 |
| **min** | 0.000000 | 0.000000 | 0.000000 | 2007.000000 |
| **25%** | 25.000000 | 47.000000 | 20.000000 | 2008.000000 |
| **50%** | 46.000000 | 58.000000 | 35.000000 | 2009.000000 |
| **75%** | 70.000000 | 72.000000 | 65.000000 | 2010.000000 |
| **max** | 97.000000 | 96.000000 | 300.000000 | 2011.000000 |

In [7]:
```
movies.shape
```

Out[7]:
```
(559, 6)
```

In [8]:
```
movies.head()
```

Out[8]:

| | Film | Genre | Rotten Tomatoes Ratings % | Audience Ratings % | Budget (million $) | Year of release |
|---|---|---|---|---|---|---|
| **0** | (500) Days of Summer | Comedy | 87 | 81 | 8 | 2009 |
| **1** | 10,000 B.C. | Adventure | 9 | 44 | 105 | 2008 |
| **2** | 12 Rounds | Action | 30 | 52 | 20 | 2009 |
| **3** | 127 Hours | Adventure | 93 | 84 | 18 | 2010 |
| **4** | 17 Again | Comedy | 55 | 70 | 20 | 2009 |

In [9]:
```
movies.tail()
```

Out[9]:

| | Film | Genre | Rotten Tomatoes Ratings % | Audience Ratings % | Budget (million $) | Year of release |
|---|---|---|---|---|---|---|
| **554** | Your Highness | Comedy | 26 | 36 | 50 | 2011 |
| **555** | Youth in Revolt | Comedy | 68 | 52 | 18 | 2009 |
| **556** | Zodiac | Thriller | 89 | 73 | 65 | 2007 |
| **557** | Zombieland | Action | 90 | 87 | 24 | 2009 |
| **558** | Zookeeper | Comedy | 14 | 42 | 80 | 2011 |

In [10]:
```
movies.columns
```

Out[10]:
```
Index(['Film', 'Genre', 'Rotten Tomatoes Ratings %', 'Audience Ratings %',
       'Budget (million $)', 'Year of release'],
      dtype='object')
```

In [11]:
```
movies.columns = ['Film', 'Genre', 'CriticRating', 'AudienceRating','BudgetMilli
```

In [12]:
```
movies.columns
```

Out[12]:
```
Index(['Film', 'Genre', 'CriticRating', 'AudienceRating', 'BudgetMillions',
       'Year'],
      dtype='object')
```

In [13]:
```
movies.isnull()
```

Out[13]:

| | Film | Genre | CriticRating | AudienceRating | BudgetMillions | Year |
|---|---|---|---|---|---|---|
| **0** | False | False | False | False | False | False |
| **1** | False | False | False | False | False | False |
| **2** | False | False | False | False | False | False |
| **3** | False | False | False | False | False | False |
| **4** | False | False | False | False | False | False |
| **...** | ... | ... | ... | ... | ... | ... |
| **554** | False | False | False | False | False | False |
| **555** | False | False | False | False | False | False |
| **556** | False | False | False | False | False | False |
| **557** | False | False | False | False | False | False |
| **558** | False | False | False | False | False | False |

559 rows × 6 columns

In [14]:
```
movies.isnull().all()
```

Out[14]:
```
Film              False
Genre             False
CriticRating      False
AudienceRating    False
BudgetMillions    False
Year              False
dtype: bool
```

In [15]:
```
movies.isnull().all().all()
```

Out[15]:
```
False
```

In [16]:
```
movies.Film = movies.Film.astype('category')
```

In [17]:
```
movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 559 entries, 0 to 558
Data columns (total 6 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Film            559 non-null    category
 1   Genre           559 non-null    object
 2   CriticRating    559 non-null    int64
 3   AudienceRating  559 non-null    int64
 4   BudgetMillions  559 non-null    int64
 5   Year            559 non-null    int64
dtypes: category(1), int64(4), object(1)
memory usage: 43.6+ KB
```

In [18]:
```
movies.Genre = movies.Genre.astype('category')
movies.Year = movies.Year.astype('category')
```

In [19]:
```
movies.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 559 entries, 0 to 558
Data columns (total 6 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Film            559 non-null    category
 1   Genre           559 non-null    category
 2   CriticRating    559 non-null    int64
 3   AudienceRating  559 non-null    int64
 4   BudgetMillions  559 non-null    int64
 5   Year            559 non-null    category
dtypes: category(3), int64(3)
memory usage: 36.5 KB
```

In [20]:
```
movies.describe()
```

Out[20]:

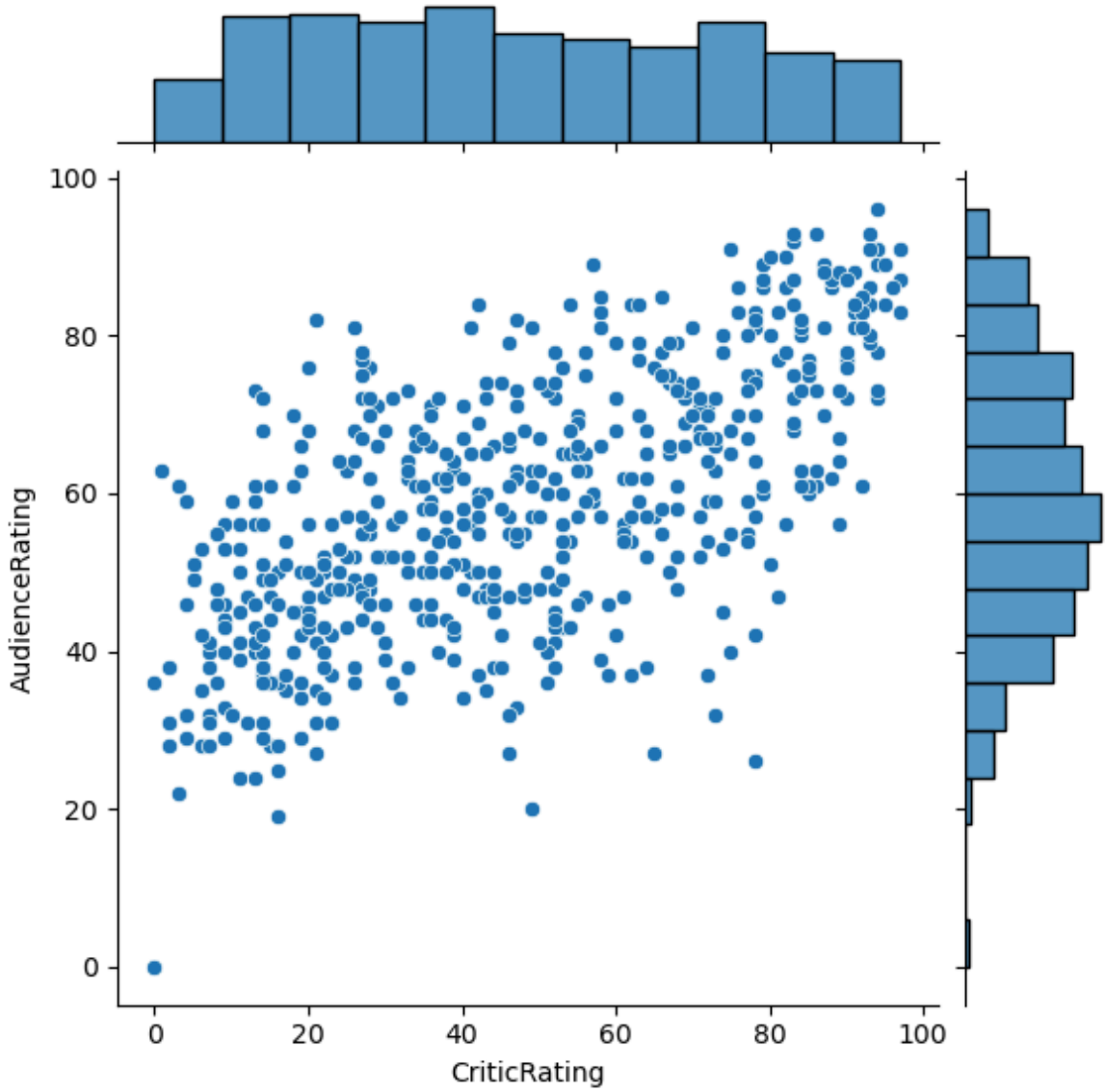
| | CriticRating | AudienceRating | BudgetMillions |
|---|---|---|---|
| **count** | 559.000000 | 559.000000 | 559.000000 |
| **mean** | 47.309481 | 58.744186 | 50.236136 |
| **std** | 26.413091 | 16.826887 | 48.731817 |
| **min** | 0.000000 | 0.000000 | 0.000000 |
| **25%** | 25.000000 | 47.000000 | 20.000000 |
| **50%** | 46.000000 | 58.000000 | 35.000000 |
| **75%** | 70.000000 | 72.000000 | 65.000000 |
| **max** | 97.000000 | 96.000000 | 300.000000 |

In [21]:
```
import matplotlib.pyplot as plt
import seaborn as sns

%matplotlib inline

import warnings
warnings.filterwarnings('ignore')
```

## JOINTPLOT

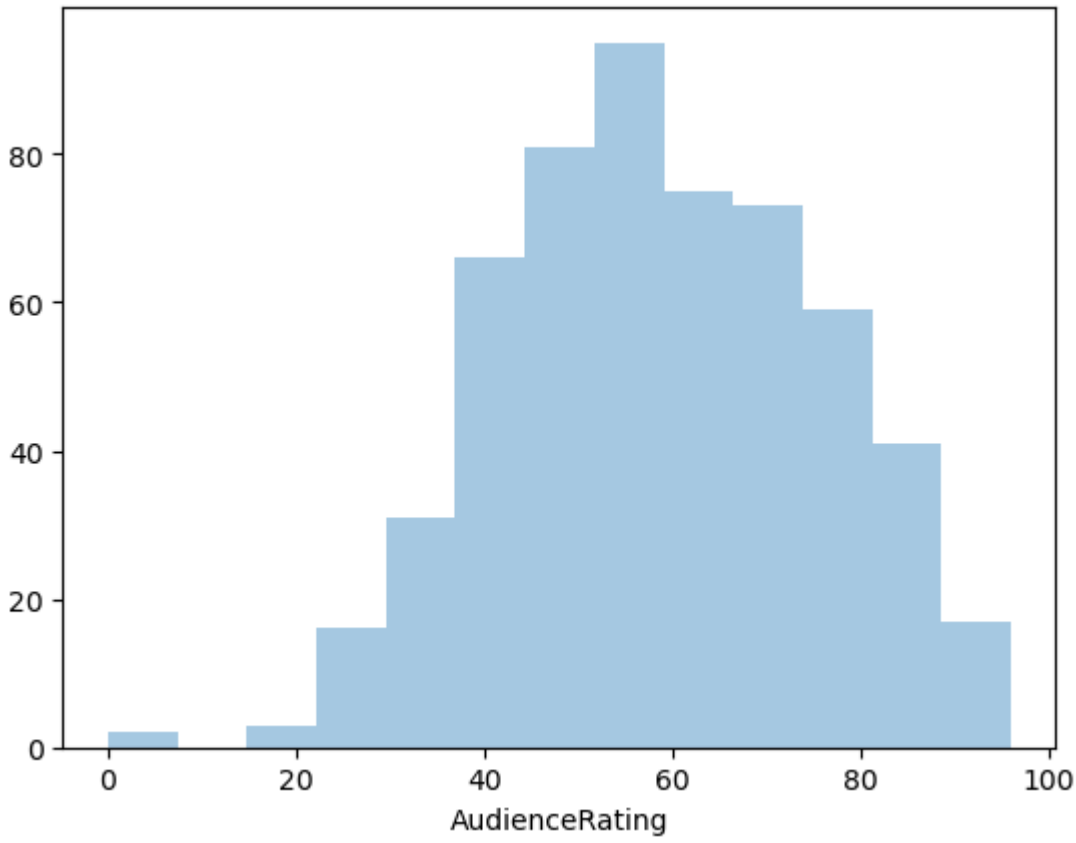
Draw a plot of two variables with bivariate and univariate graphs.

In [22]:
```
j=sns.jointplot(data = movies, x = 'CriticRating', y = 'AudienceRating')
```



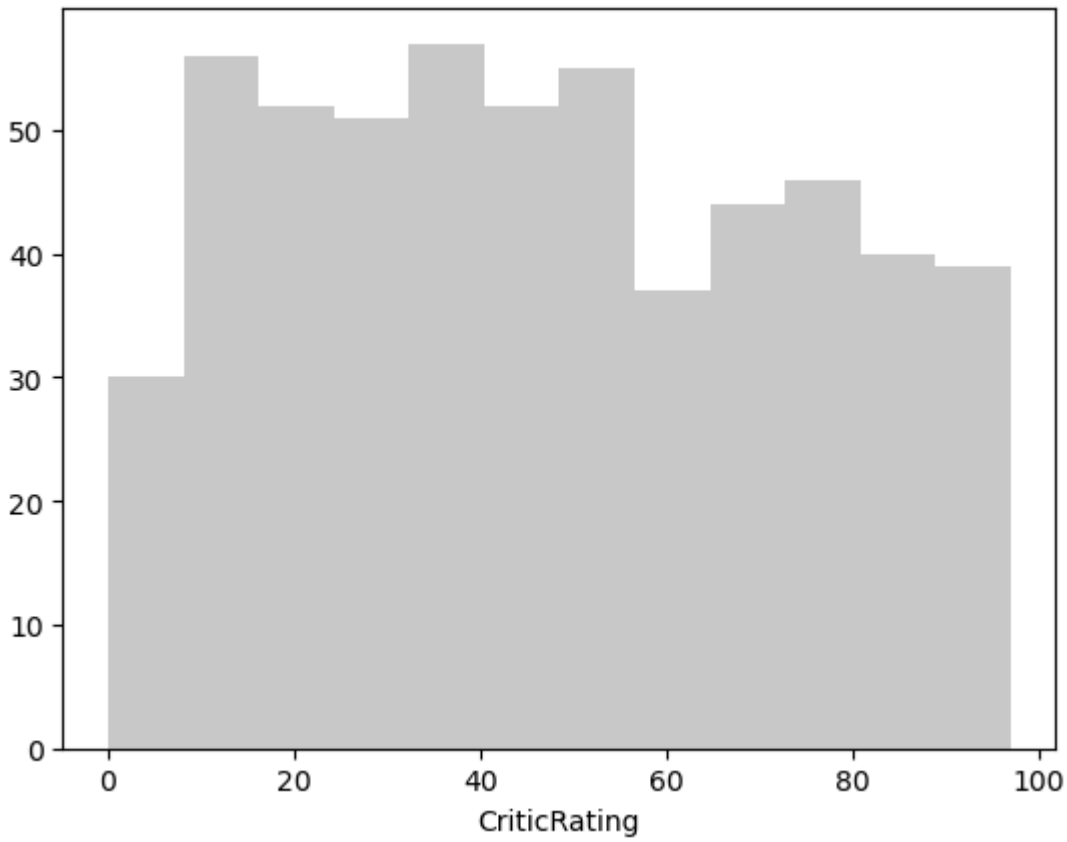

In [23]:
```
y=movies['AudienceRating']
sns.distplot(y,kde=False,bins=13)
```

Out[23]:
```
<Axes: xlabel='AudienceRating'>
```

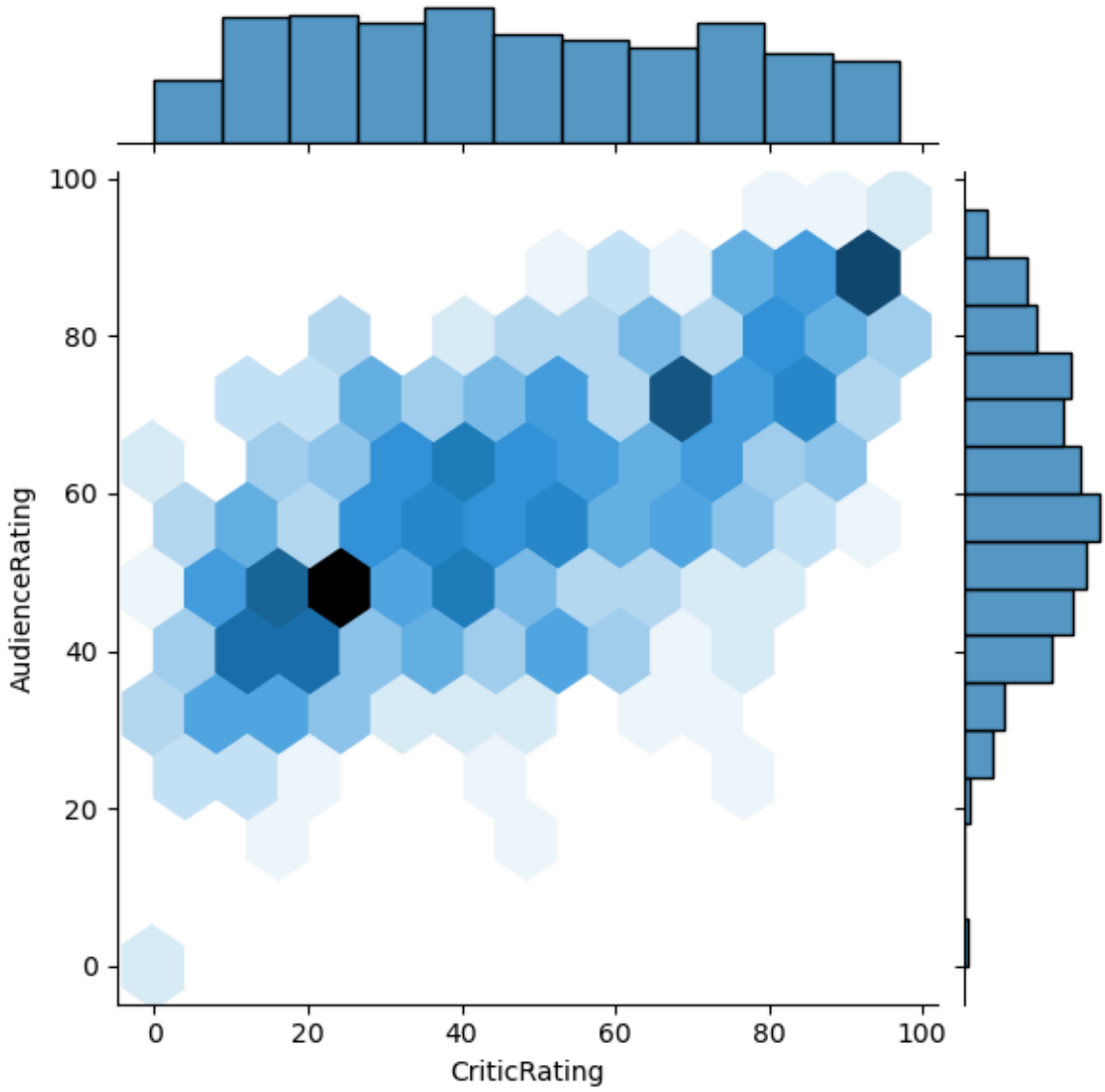



In [24]:
```
y=movies['CriticRating']
sns.distplot(y,kde=False,color='gray',bins=12)
```

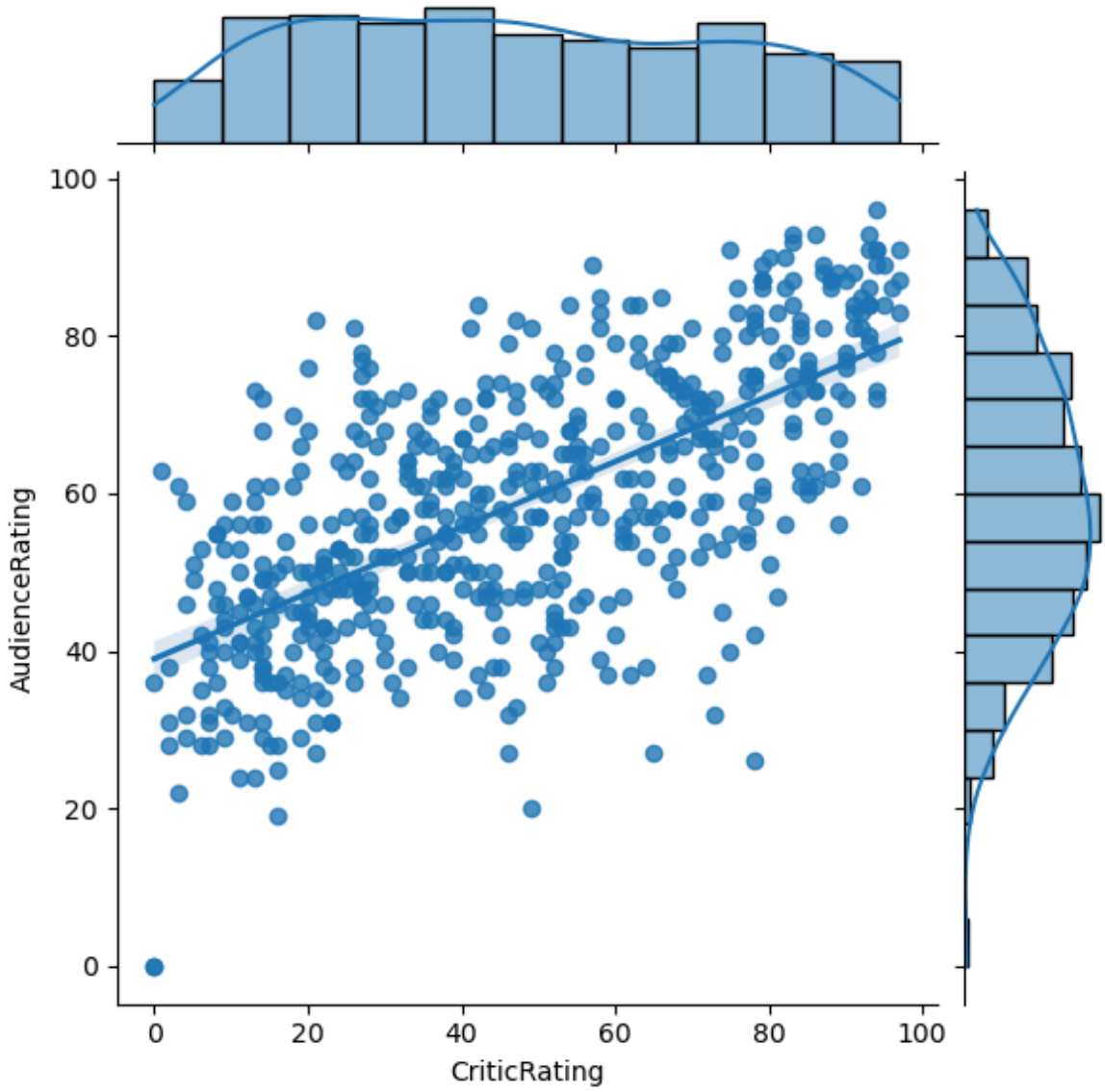
Out[24]: <Axes: xlabel='CriticRating'>



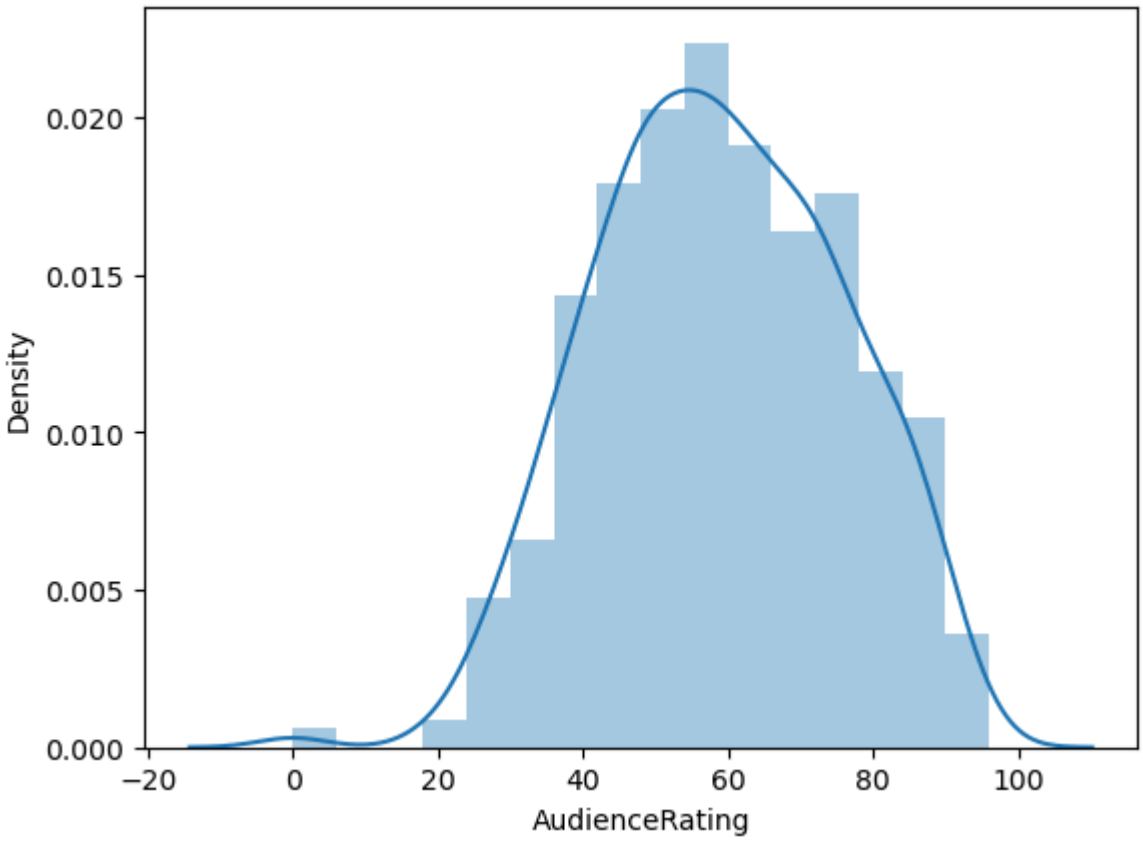

In [25]:
```
j = sns.jointplot(data = movies, x = 'CriticRating', y = 'AudienceRating',kind='
```



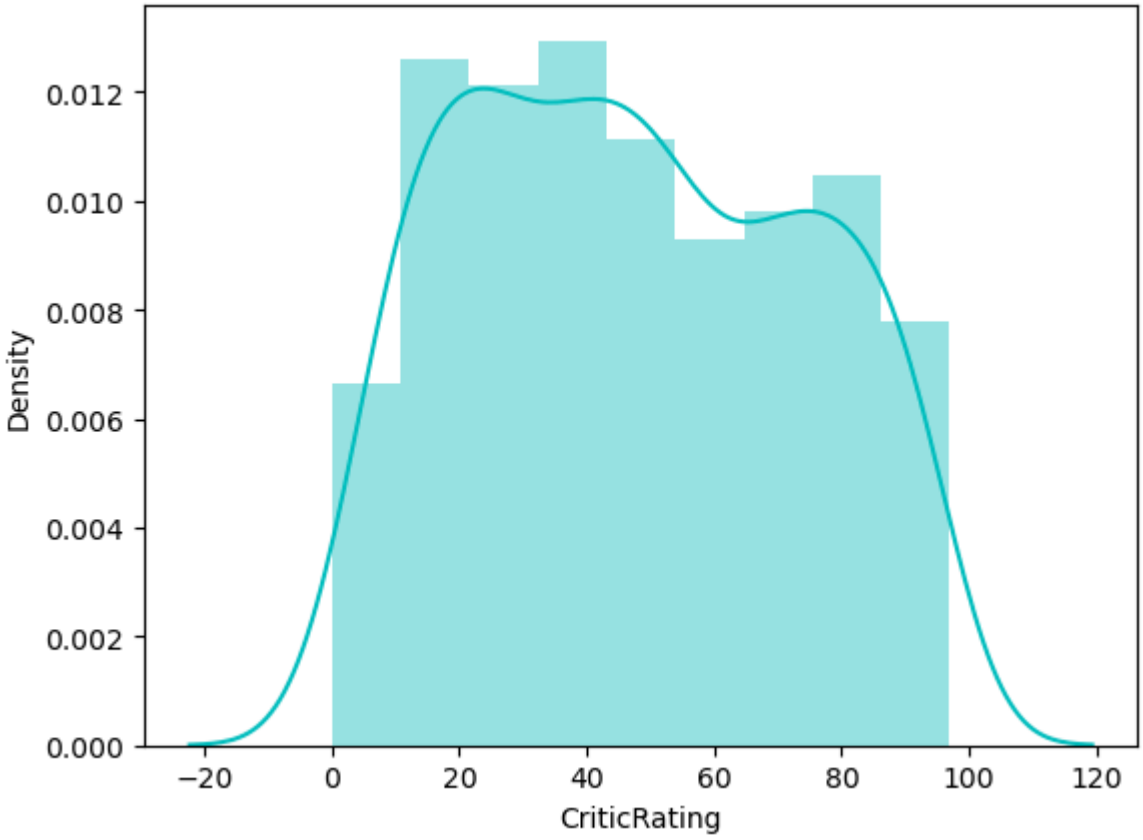

In [26]:
```
j = sns.jointplot(data = movies, x = 'CriticRating', y = 'AudienceRating',kind =
```



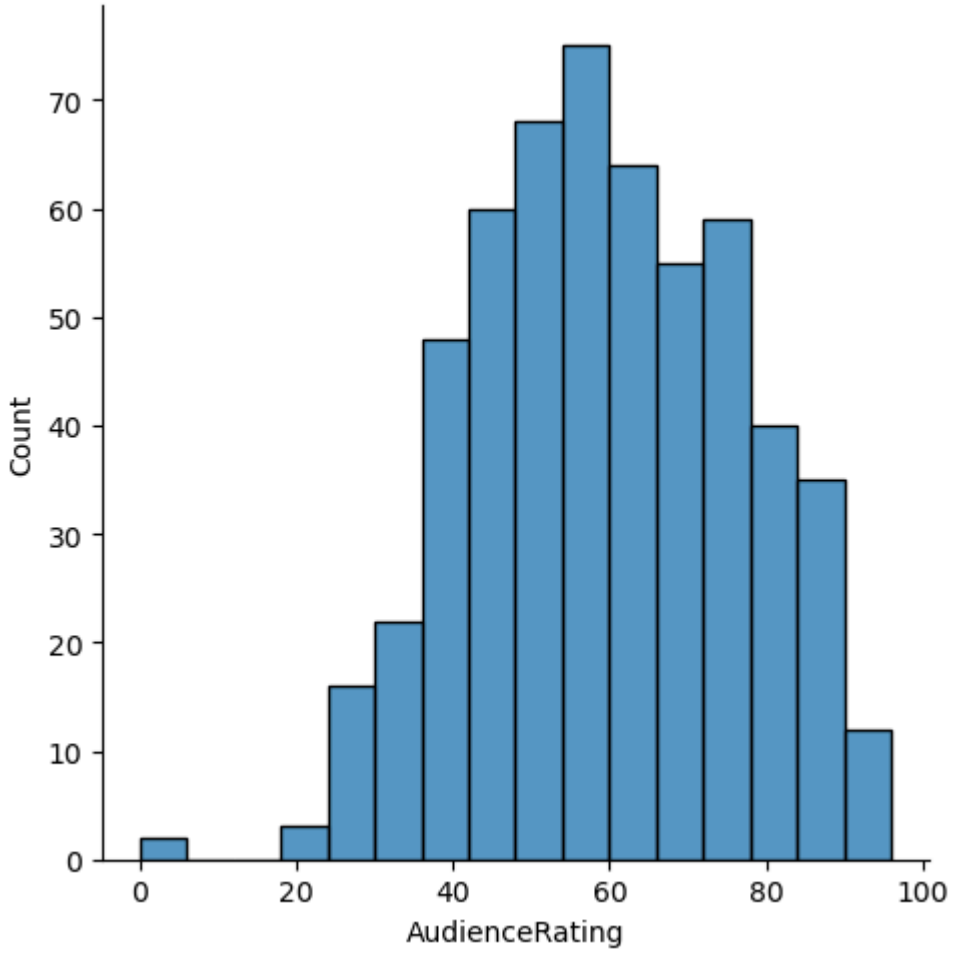

In [27]:
```
m1 = sns.distplot(movies['AudienceRating'])
```



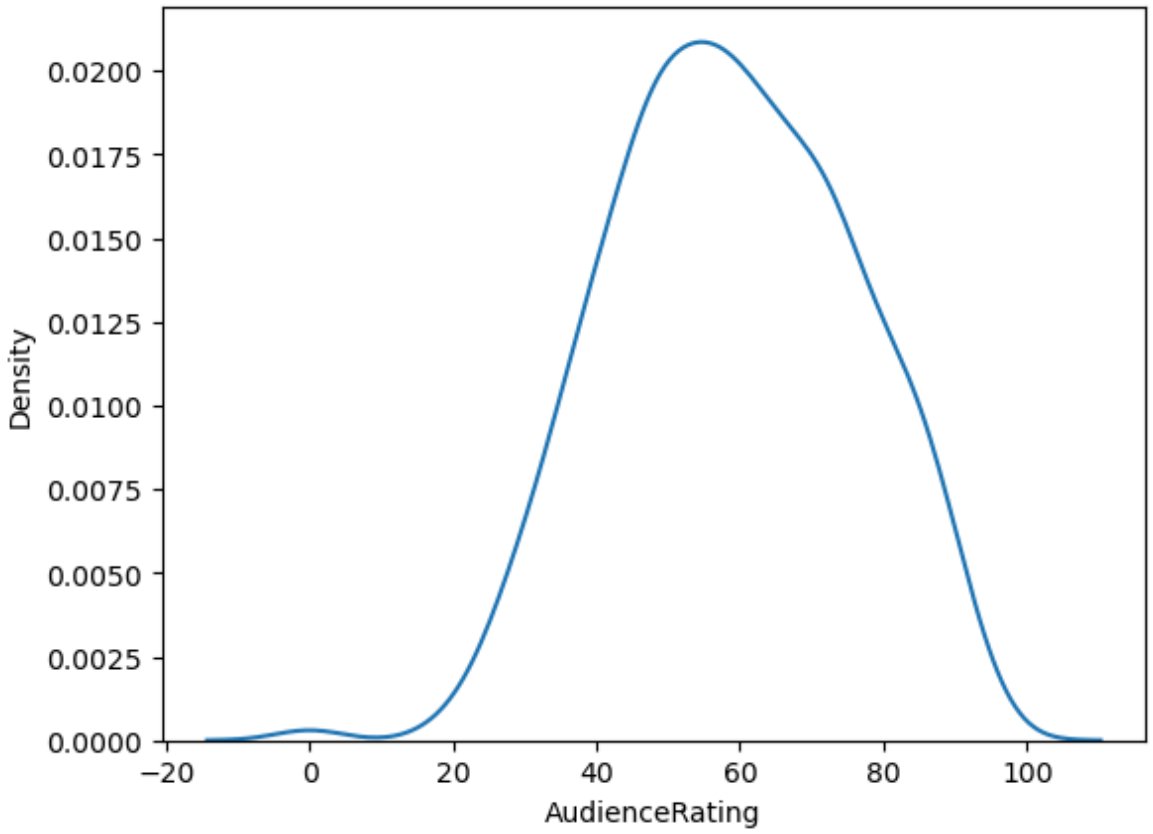

In [28]:
```
m1 = sns.distplot(movies['CriticRating'],color='c')
```




In [29]:
```
m1 = sns.displot(movies['AudienceRating'])
```

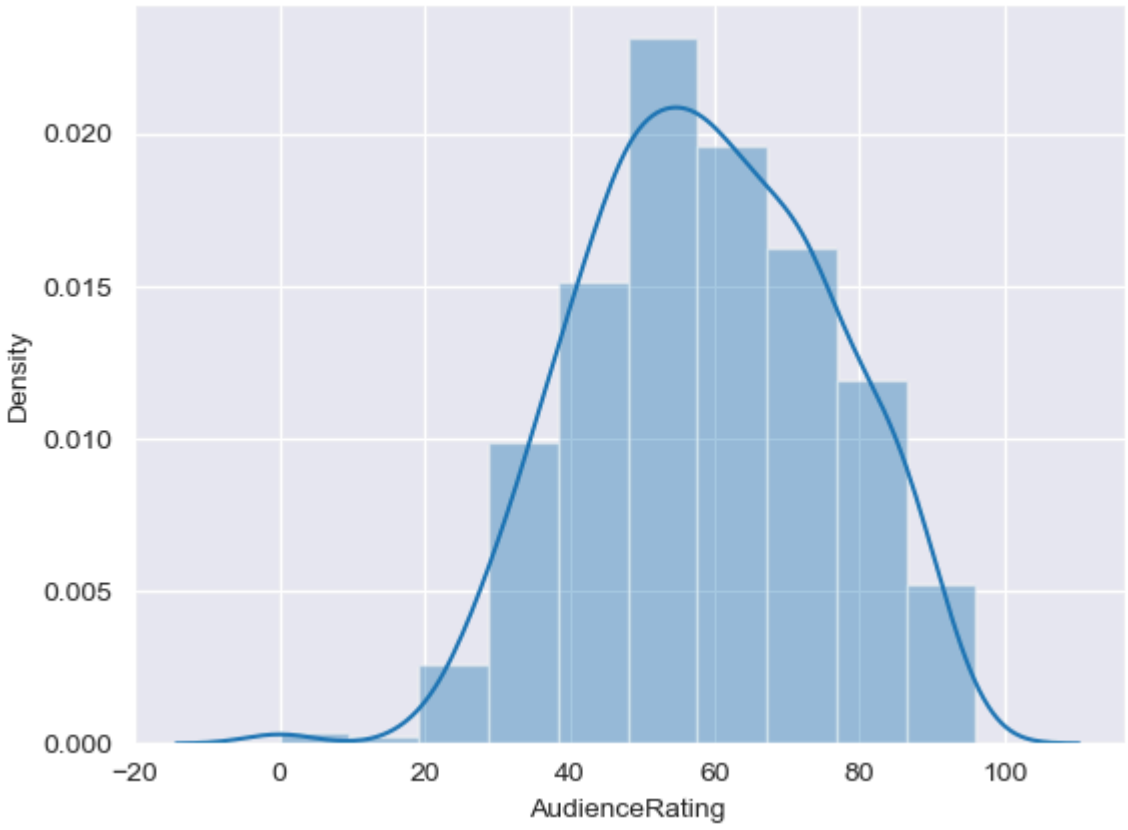



In [30]:
```
m1 = sns.kdeplot(movies['AudienceRating'])
```



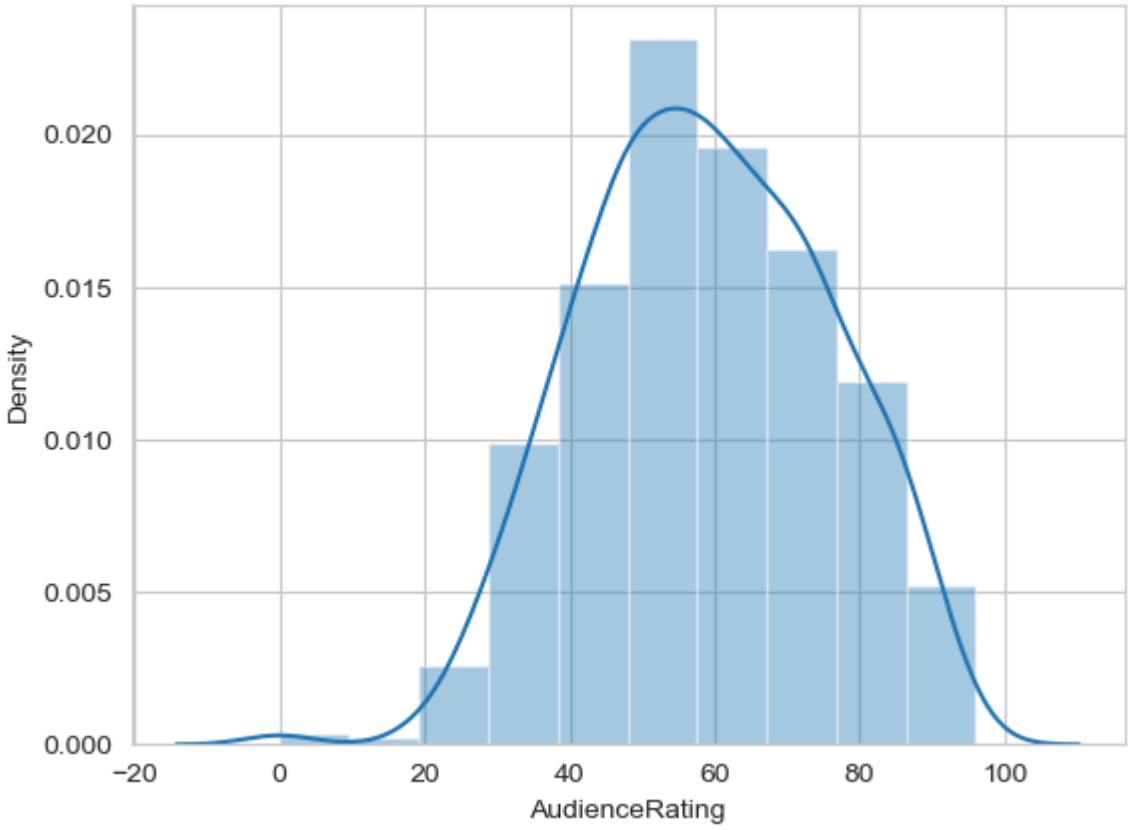

In [31]:
```
sns.set_style('darkgrid')
```

In [32]:
```
m1 = sns.distplot(movies['AudienceRating'],bins=10)
```

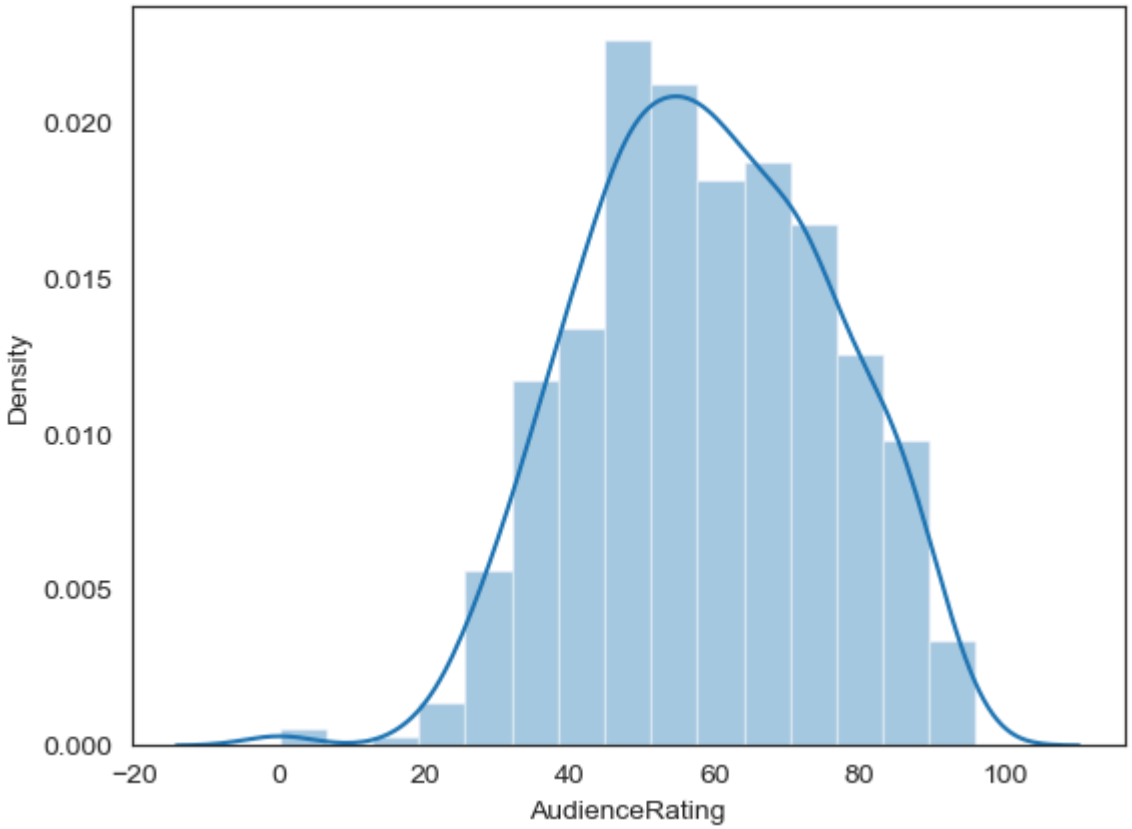



In [33]:
```
sns.set_style('whitegrid')
```

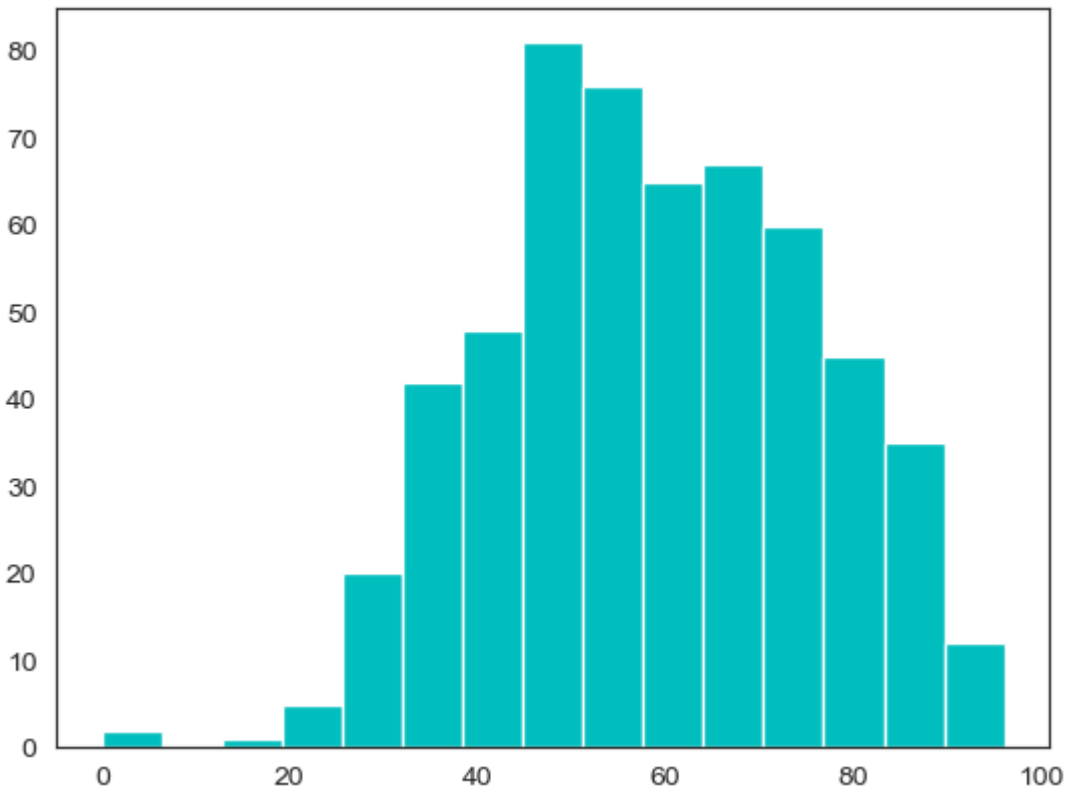
In [34]:
```
m1 = sns.distplot(movies['AudienceRating'],bins=10)
```



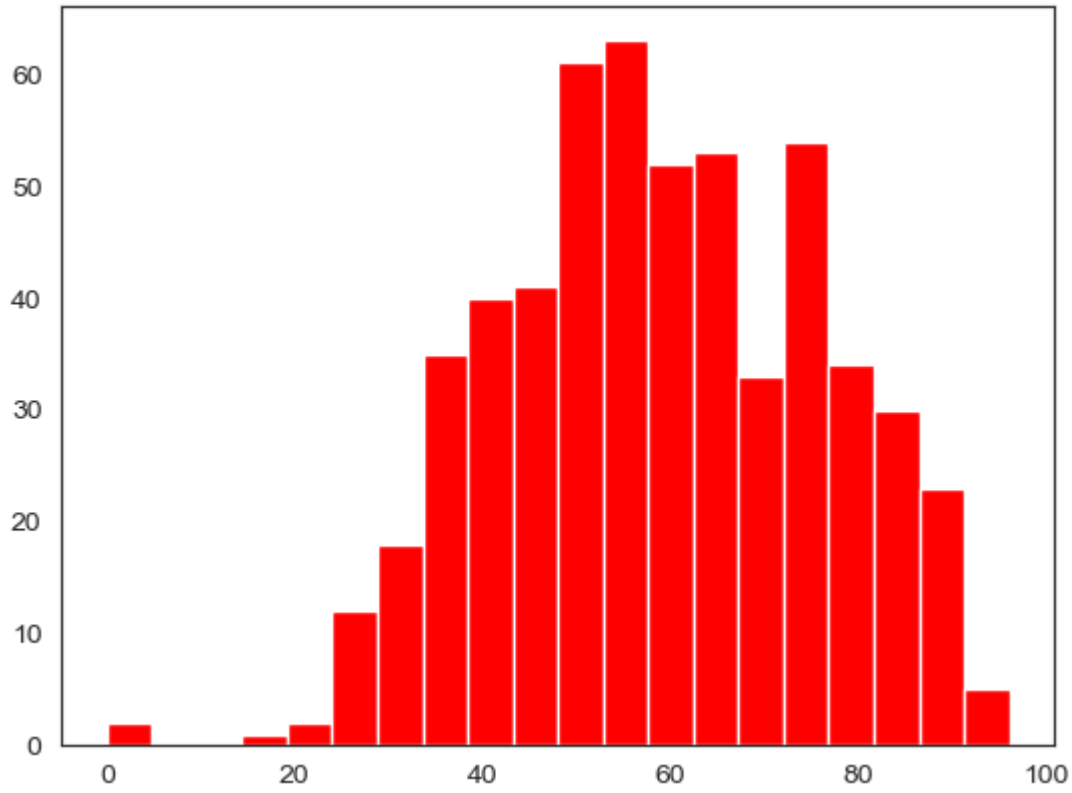
In [35]:
```
sns.set_style('white')
m1 = sns.distplot(movies['AudienceRating'],bins=15)
```



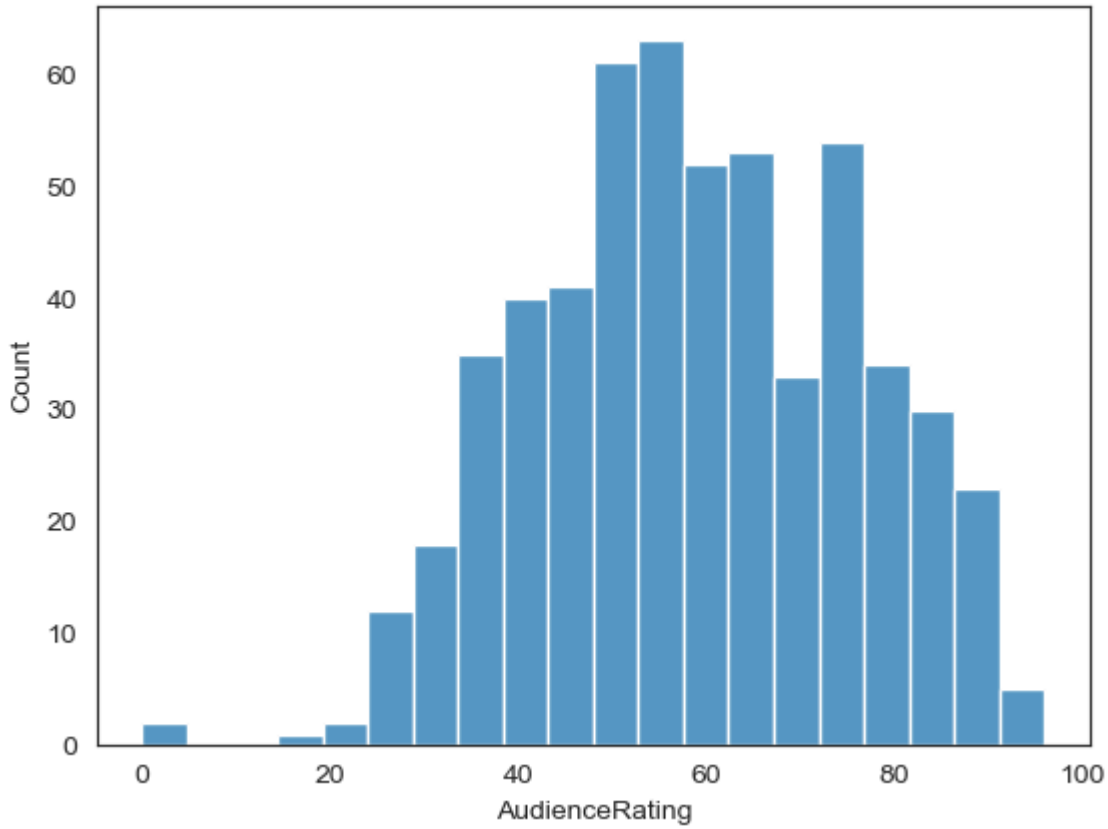

In [36]:
```
n1 = plt.hist(movies['AudienceRating'],bins=15,color='c')
```



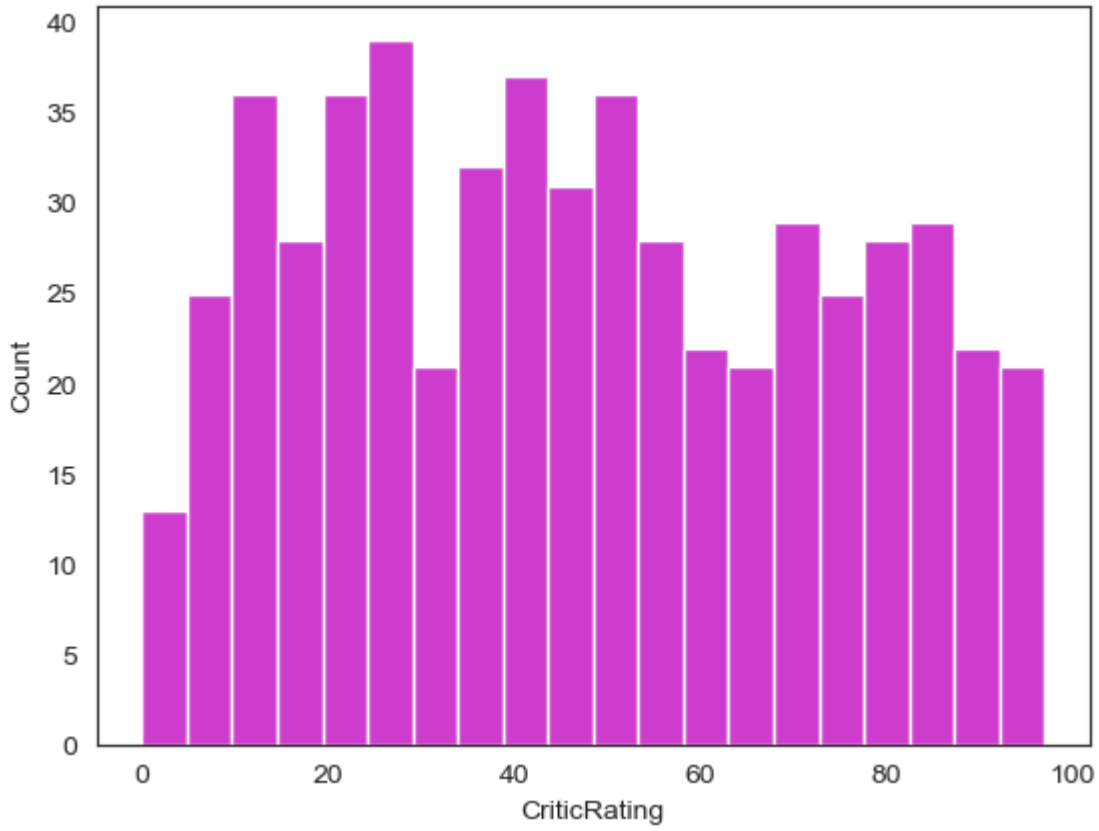

In [37]:
```
n1 = plt.hist(movies['AudienceRating'],bins=20,color='r')
```




In [38]:
```
n1 = sns.histplot(movies['AudienceRating'],bins=20) #normal distribution & calle
```

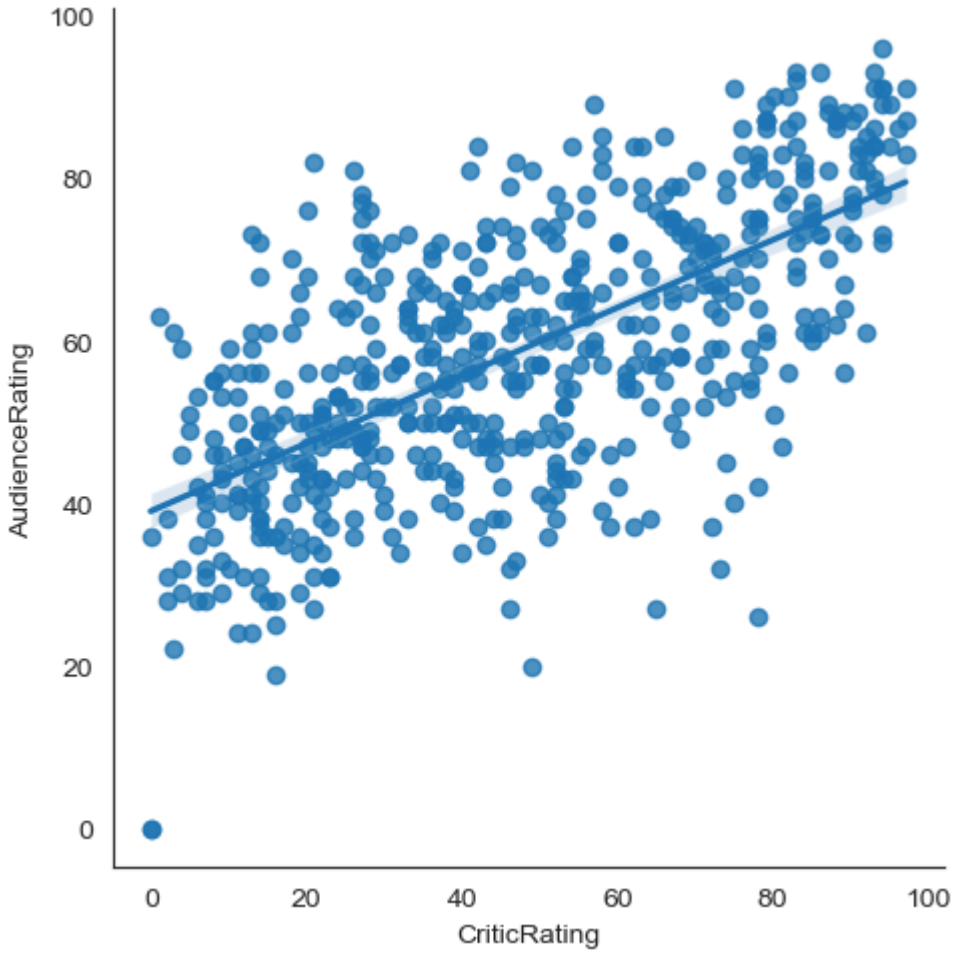



In [39]:
```
n1 = sns.histplot(movies['CriticRating'],bins=20,color='m')#uniform distribution
```



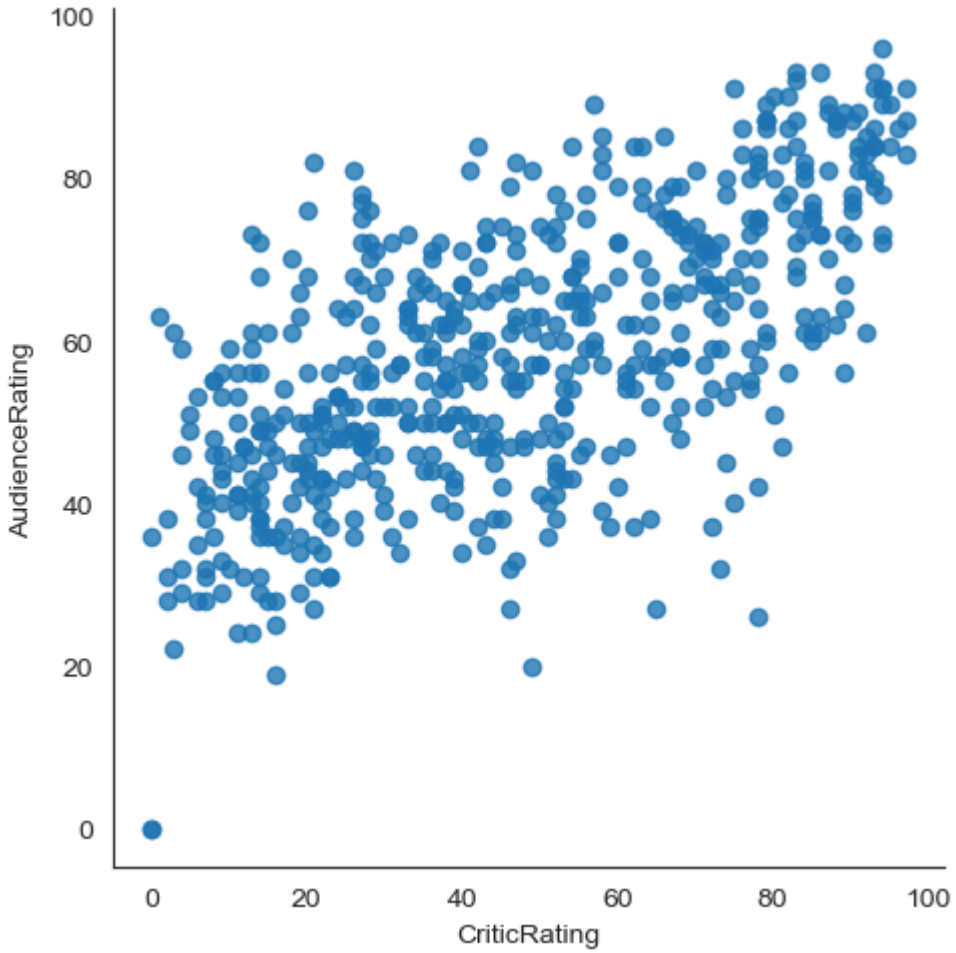

In [40]:
```
sns.lmplot(data = movies, x = 'CriticRating',y = 'AudienceRating')
```

Out[40]:
```
<seaborn.axisgrid.FacetGrid at 0x17a41433cb0>
```



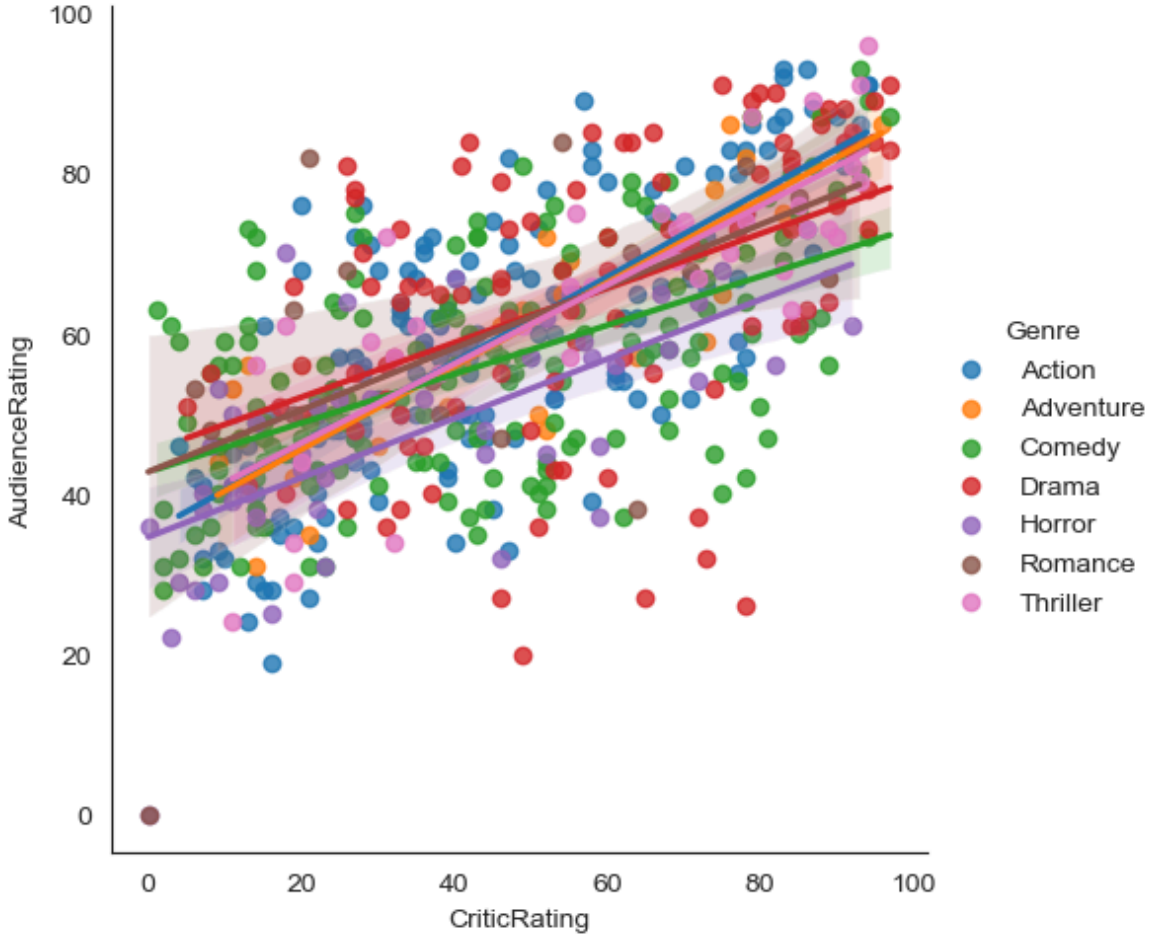
In [41]:
```
sns.lmplot(data = movies, x = 'CriticRating',y = 'AudienceRating',fit_reg = Fals
```

Out[41]: <seaborn.axisgrid.FacetGrid at 0x17a413f60c0>




In [42]:
```
sns.lmplot(data = movies, x = 'CriticRating',y = 'AudienceRating',fit_reg = True
```

Out[42]: <seaborn.axisgrid.FacetGrid at 0x17a4156fdd0>




In [43]:
```
movies.columns
```

Out[43]:
```
Index(['Film', 'Genre', 'CriticRating', 'AudienceRating', 'BudgetMillions',
       'Year'],
      dtype='object')
```

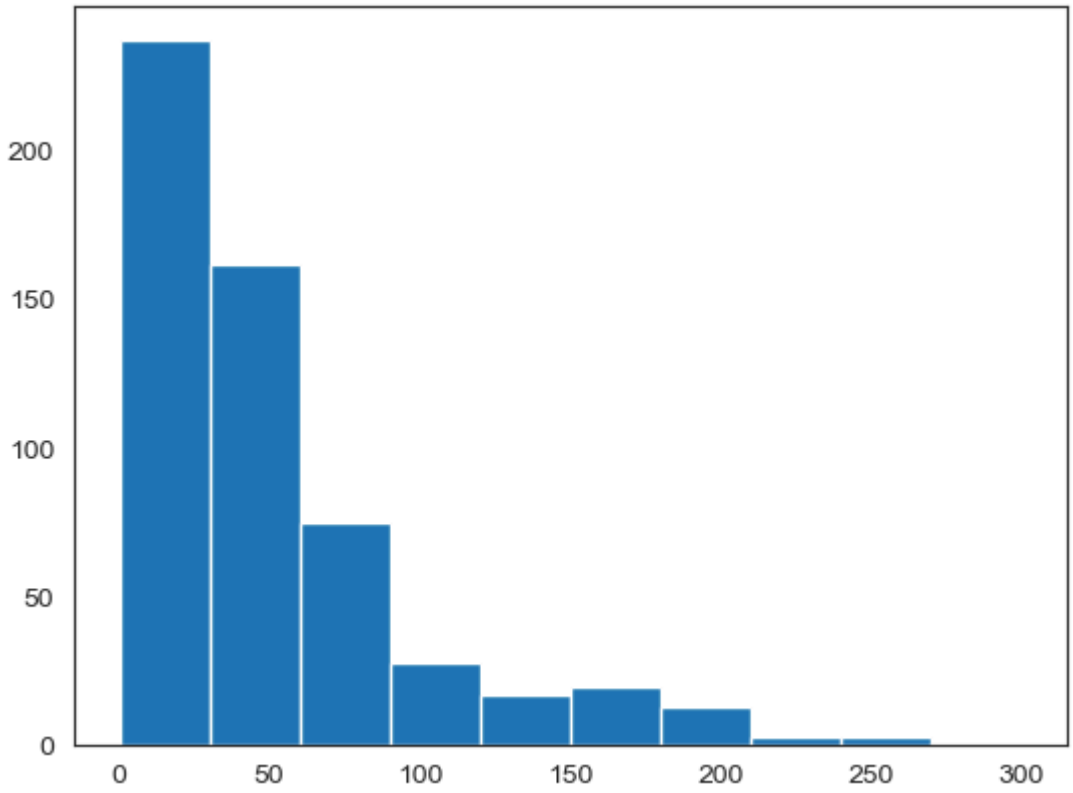
In [44]:
```
movies['BudgetMillions'].unique()
```

Out[44]:
```
array([  8, 105,  20,  18, 200,  30,  32,  28,  35,   7,  19,  45,  10,
        40,  15, 100,   5,  78, 237,  21,  70,  17,  80,   4, 150,  13,
        61,  68,  33,  26,  42,   2,  55,  37, 140,  85,   6,  38, 125,
        25,  90,  60, 163,  50,  58,  69,  75, 175,  31, 130,  24,   1,
        73,  52, 110,   0,  53, 112,  16,  36,  12, 250,  83,  11, 160,
       185, 186,  79,  47, 117,  27,  22,  66, 145,  56,   3,  95, 300,
       230,  48,  93,  39, 120, 258,  65,  82,  29,  51,  41, 155,  14,
       180, 138,  62,  59,   9, 195, 210, 170], dtype=int64)
```

In [45]:
```
movies['BudgetMillions'].nunique()
```

Out[45]:
```
99
```

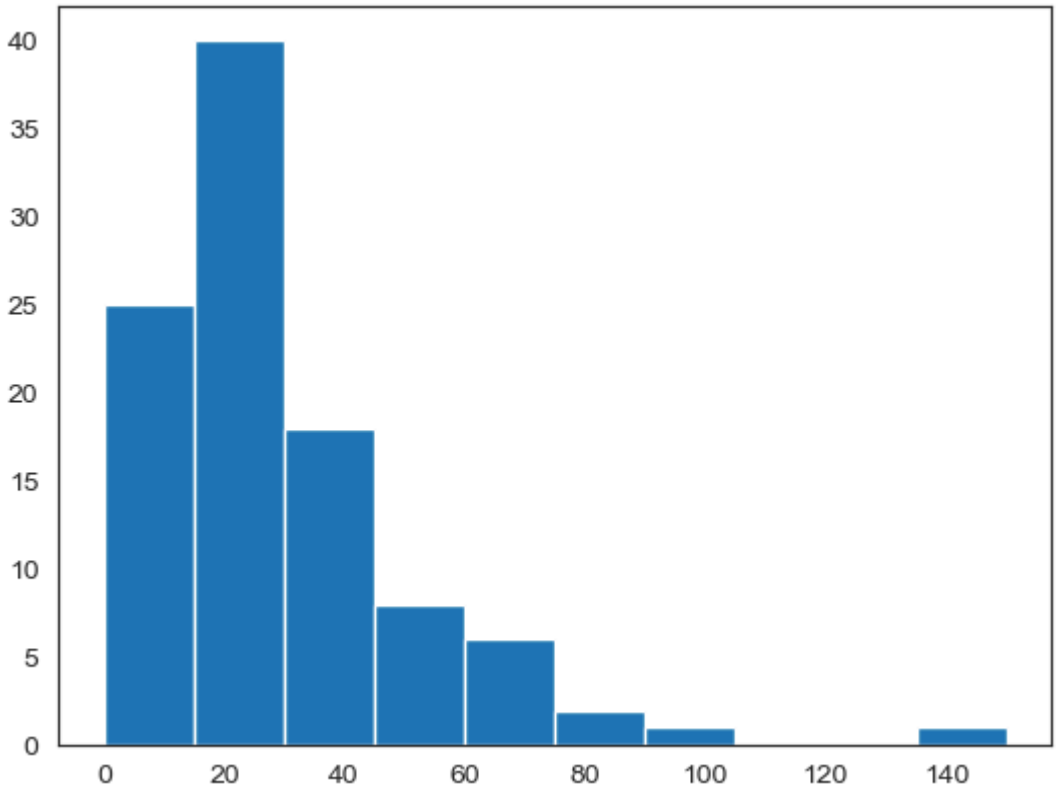
In [46]:
```
plt.hist(movies.BudgetMillions)
plt.show()
```



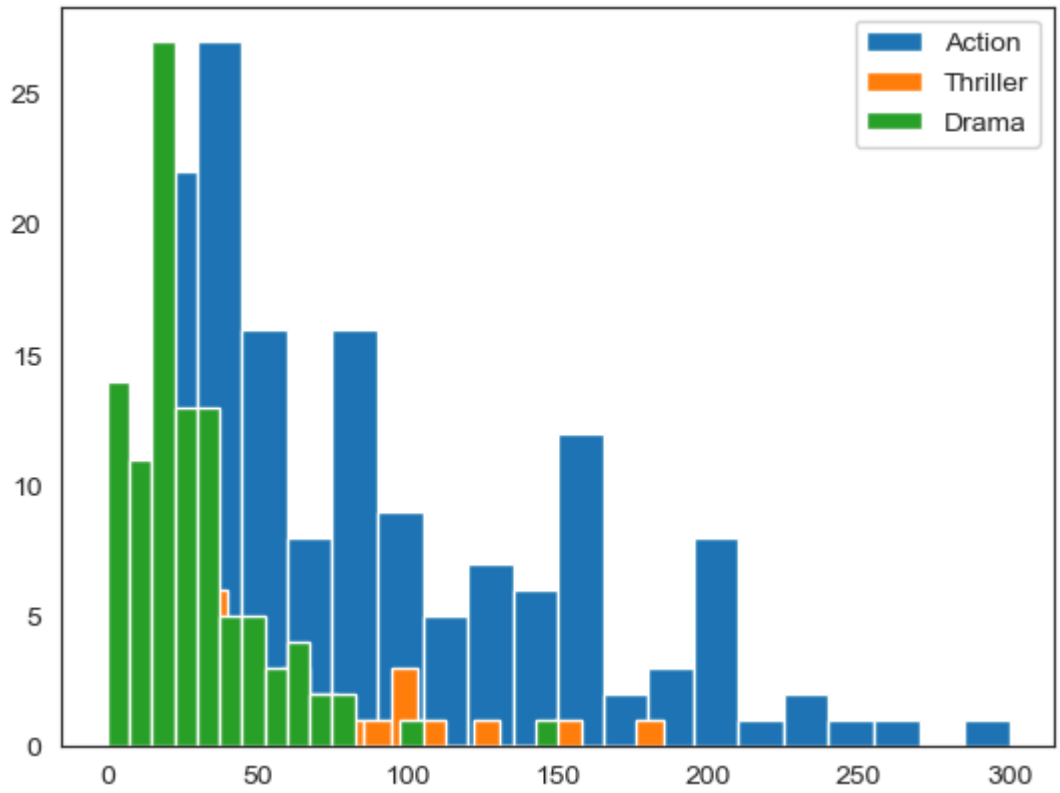

In [47]:
```
movies['Genre'].unique()
```

Out[47]:
```
['Comedy', 'Adventure', 'Action', 'Horror', 'Drama', 'Romance', 'Thriller']
Categories (7, object): ['Action', 'Adventure', 'Comedy', 'Drama', 'Horror', 'R
omance', 'Thriller']
```

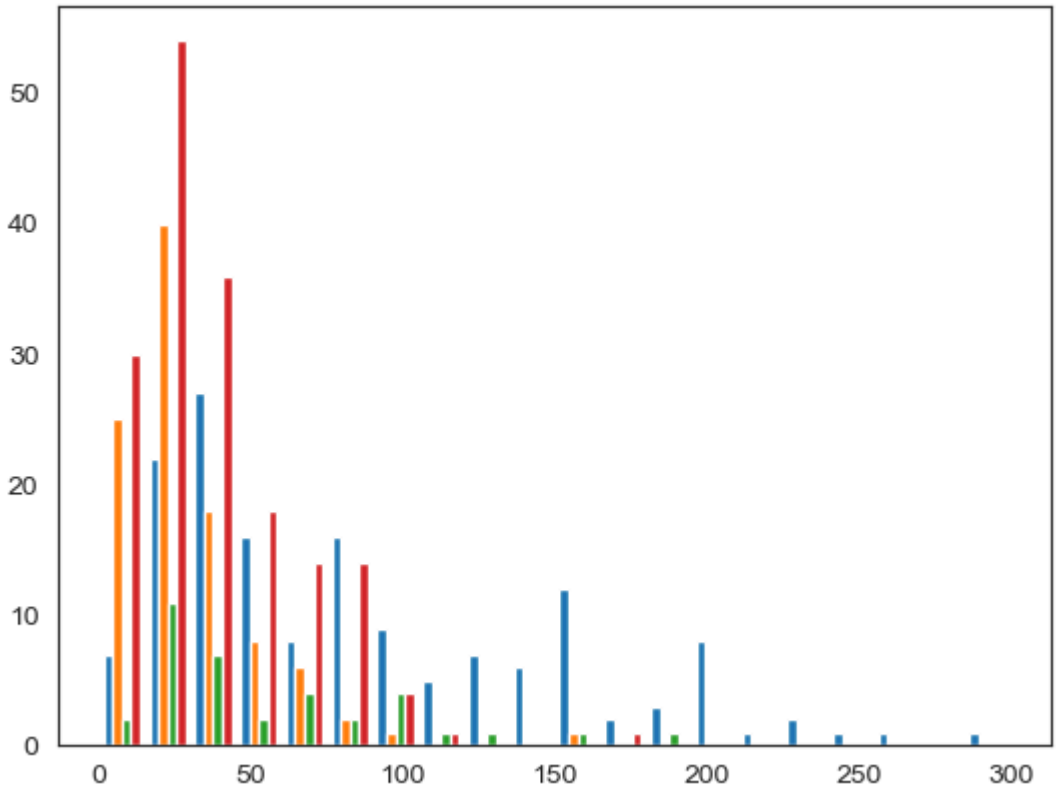
In [48]:
```
plt.hist(movies[movies.Genre == 'Drama'].BudgetMillions) # (histogram) showing h
plt.show()
```



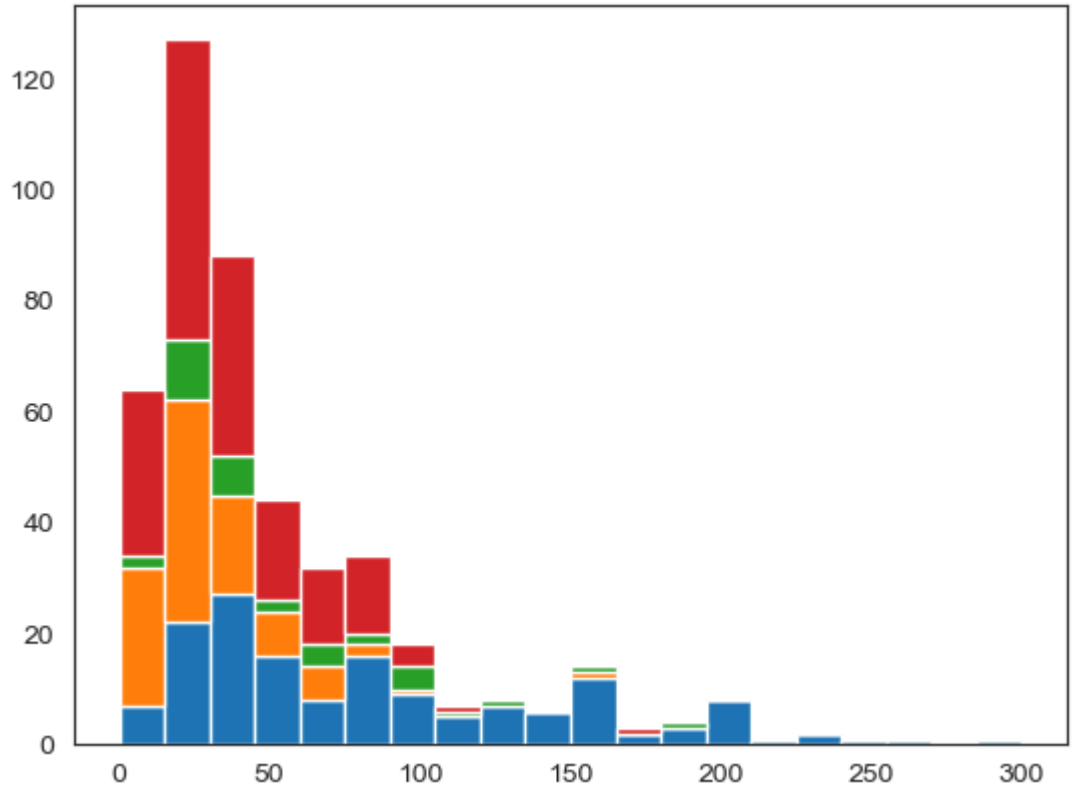
In [49]:
```
plt.hist(movies[movies.Genre == 'Action'].BudgetMillions, bins = 20,label='Actio
plt.hist(movies[movies.Genre == 'Thriller'].BudgetMillions, bins = 20,label='Thr
plt.hist(movies[movies.Genre == 'Drama'].BudgetMillions, bins = 20,label='Drama'
plt.legend()
plt.show()
```




In [50]:
```
plt.hist([movies[movies.Genre == 'Action'].BudgetMillions,\
          movies[movies.Genre == 'Drama'].BudgetMillions, \
          movies[movies.Genre == 'Thriller'].BudgetMillions, \
          movies[movies.Genre == 'Comedy'].BudgetMillions],
         bins = 20, stacked = False)
plt.show()
```




In [51]:
```
# Below plots are stacked histogram becuase overlaped
plt.hist([movies[movies.Genre == 'Action'].BudgetMillions,\
          movies[movies.Genre == 'Drama'].BudgetMillions, \
          movies[movies.Genre == 'Thriller'].BudgetMillions, \
          movies[movies.Genre == 'Comedy'].BudgetMillions],
         bins = 20, stacked = True)
plt.show()
```




In [52]:
```
# if you have 100 categories you cannot copy & paste all the things
```

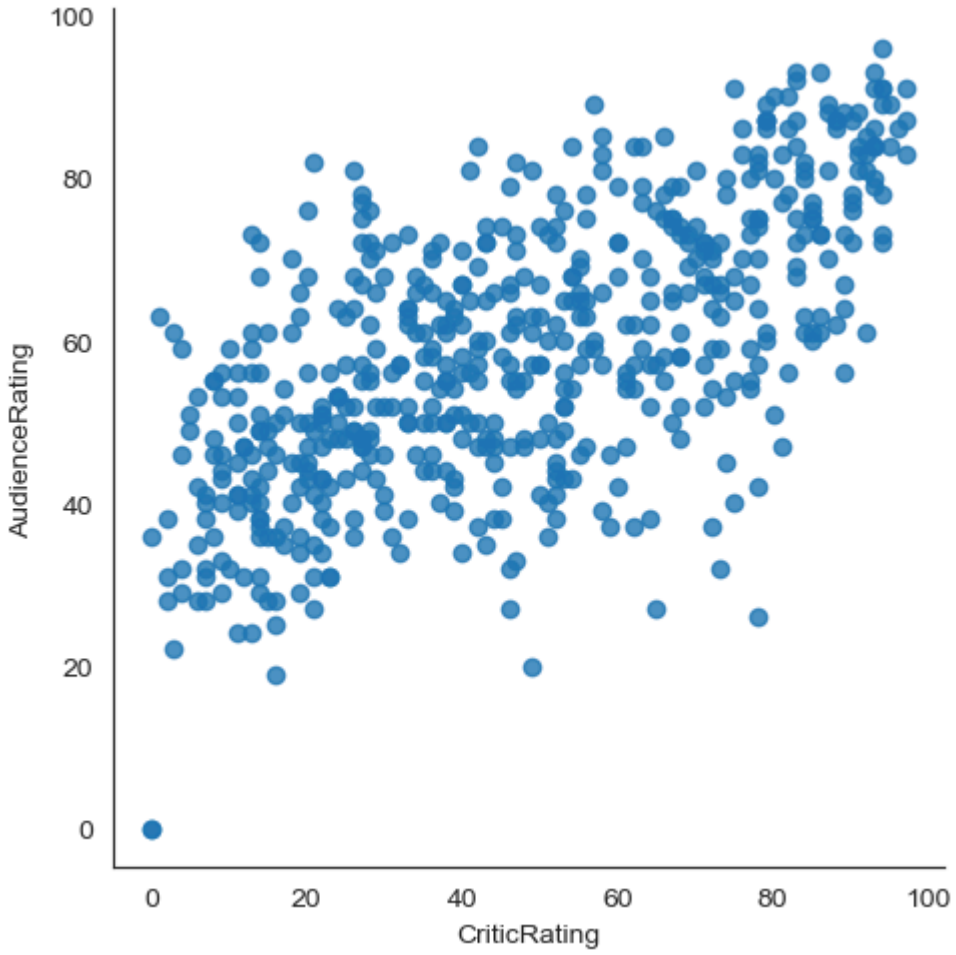
```
for gen in movies.Genre.unique():
    print(gen)
```

```
Comedy
Adventure
Action
Horror
Drama
Romance
Thriller
```

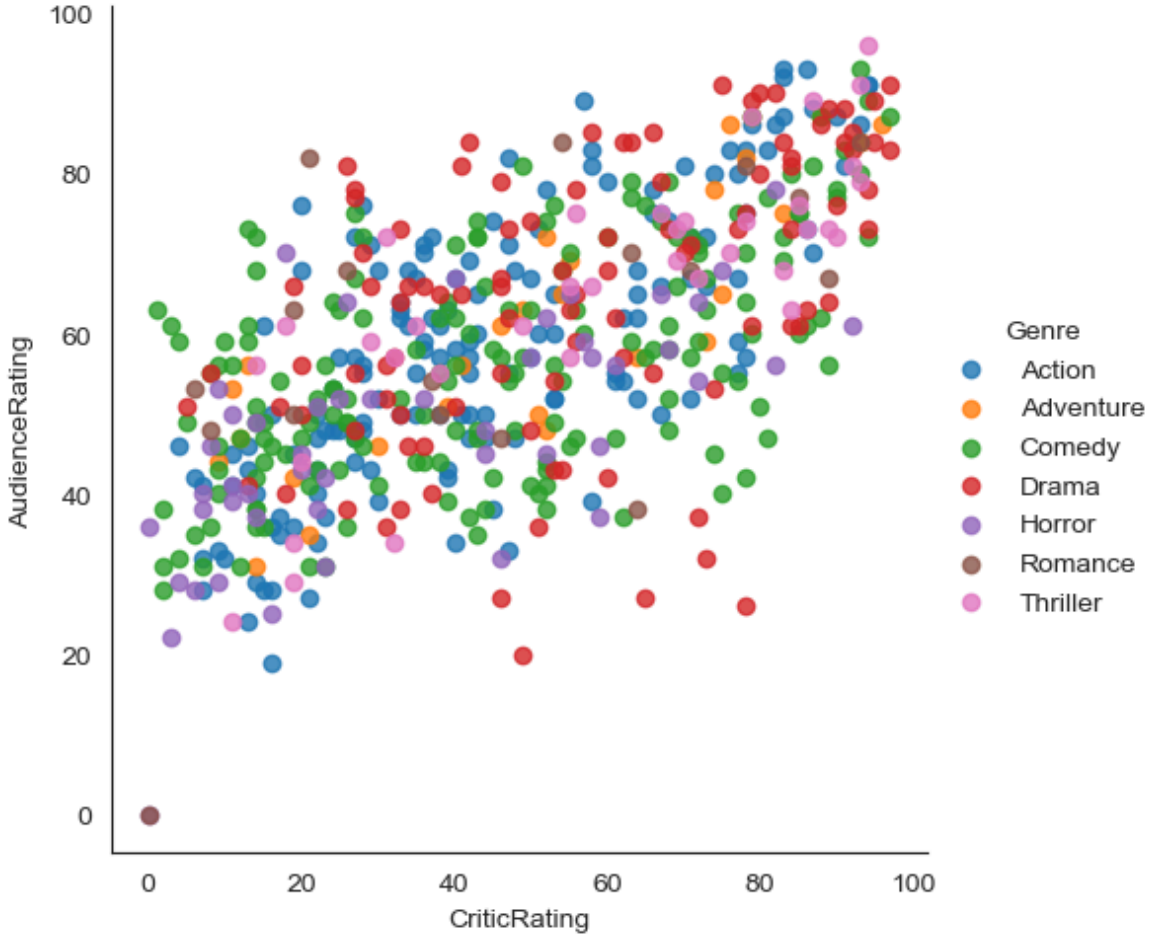
In [53]:
```
for gen in movies.Genre.cat.categories:
    print(gen)
```

```
Action
Adventure
Comedy
Drama
Horror
Romance
Thriller
```

In [54]:
```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False)
```



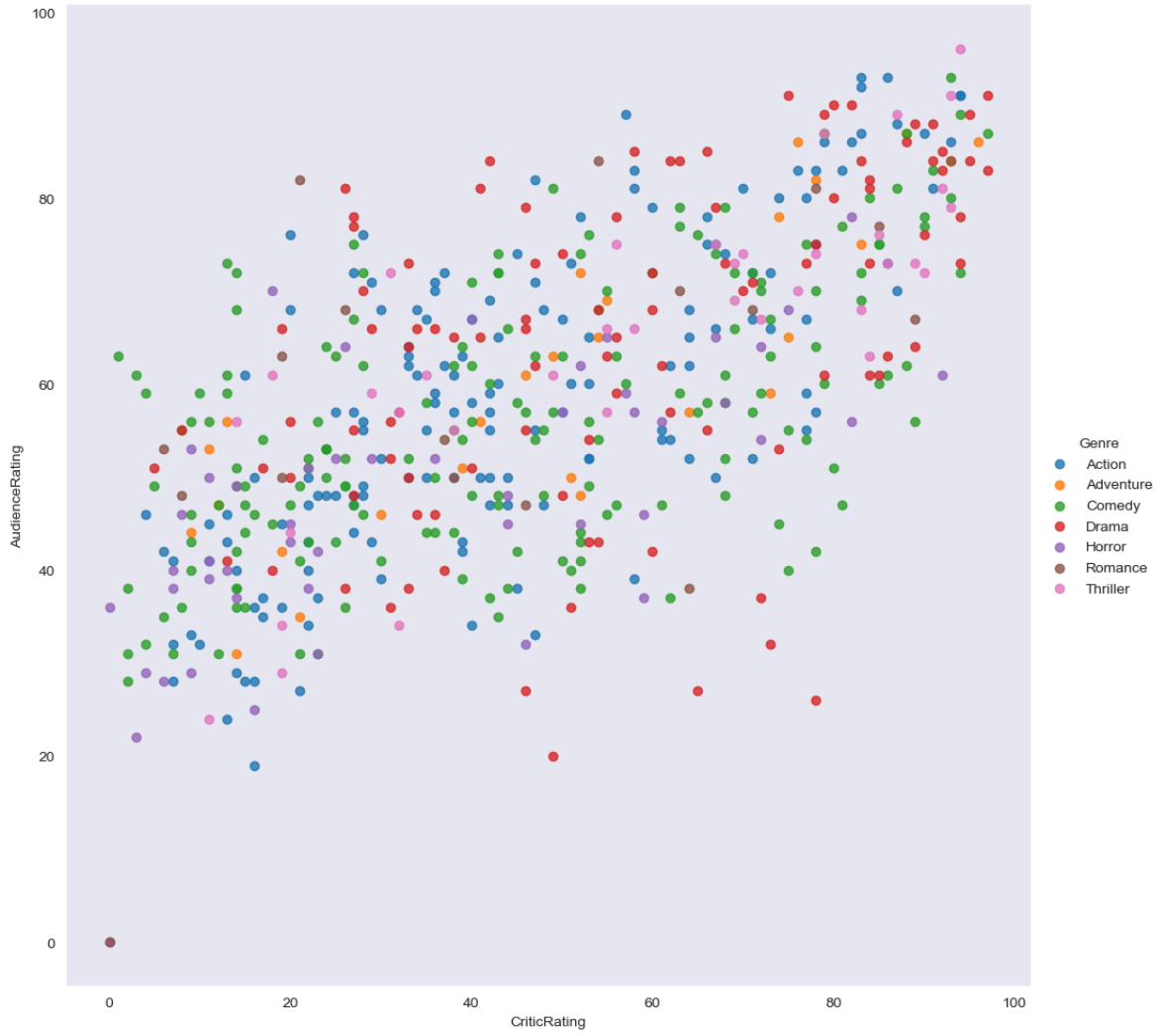

In [55]:
```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False, hue = 'Genre')
```




In [56]:
```
sns.set_style('dark')
```

height : scalar Height (in inches) of each facet. See also: `aspect`.
aspect : scalar Aspect ratio of each facet, so that `aspect * height` gives the width of each facet in inches.

In [57]:
```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False, hue = 'Genre', height = 10,aspect=1)
```

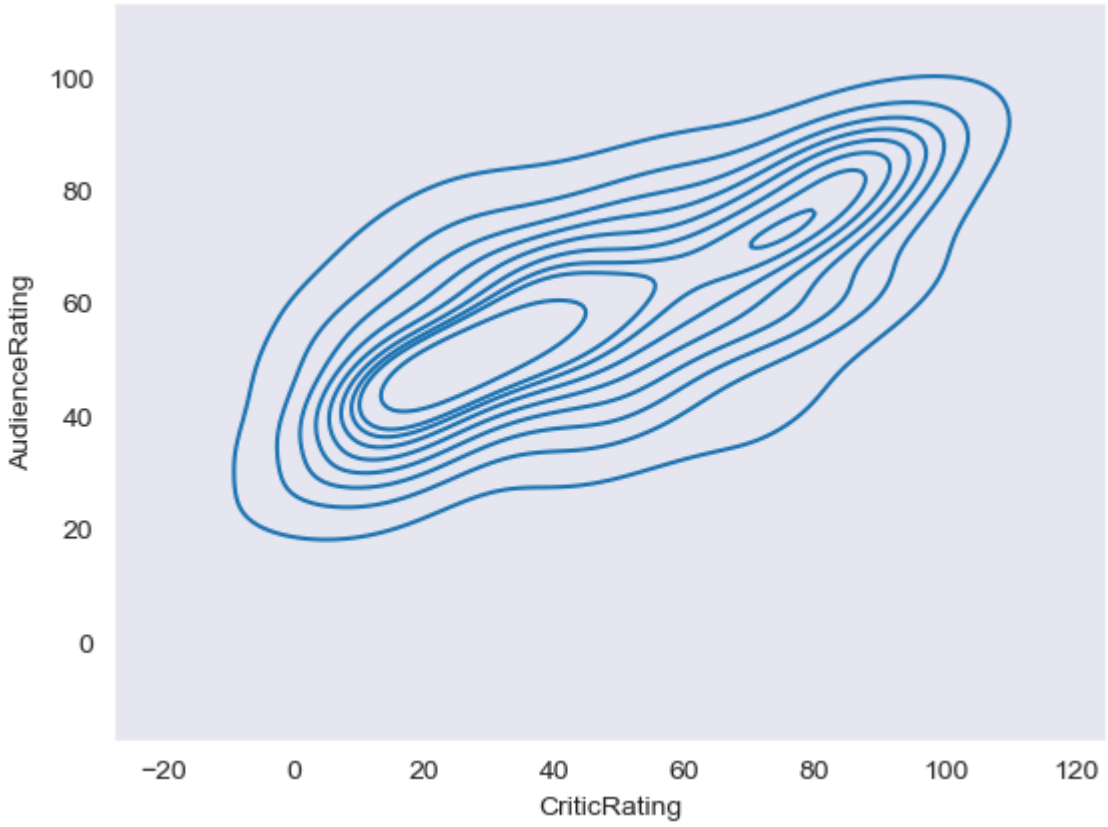



## KDE Plot

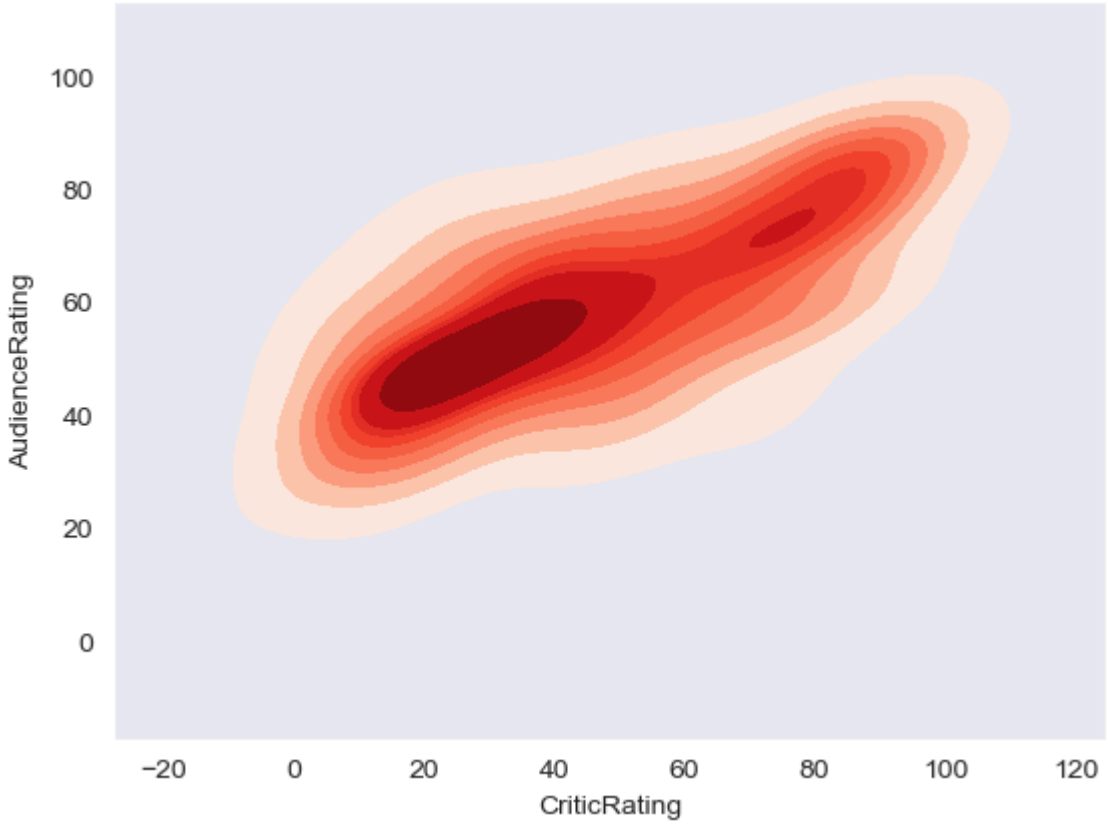
Plot univariate or bivariate distributions using kernel density estimation.

A kernel density estimate (KDE) plot is a method for visualizing the distribution of observations in a dataset, analogous to a histogram. KDE represents the data using a continuous probability density curve in one or more dimensions.

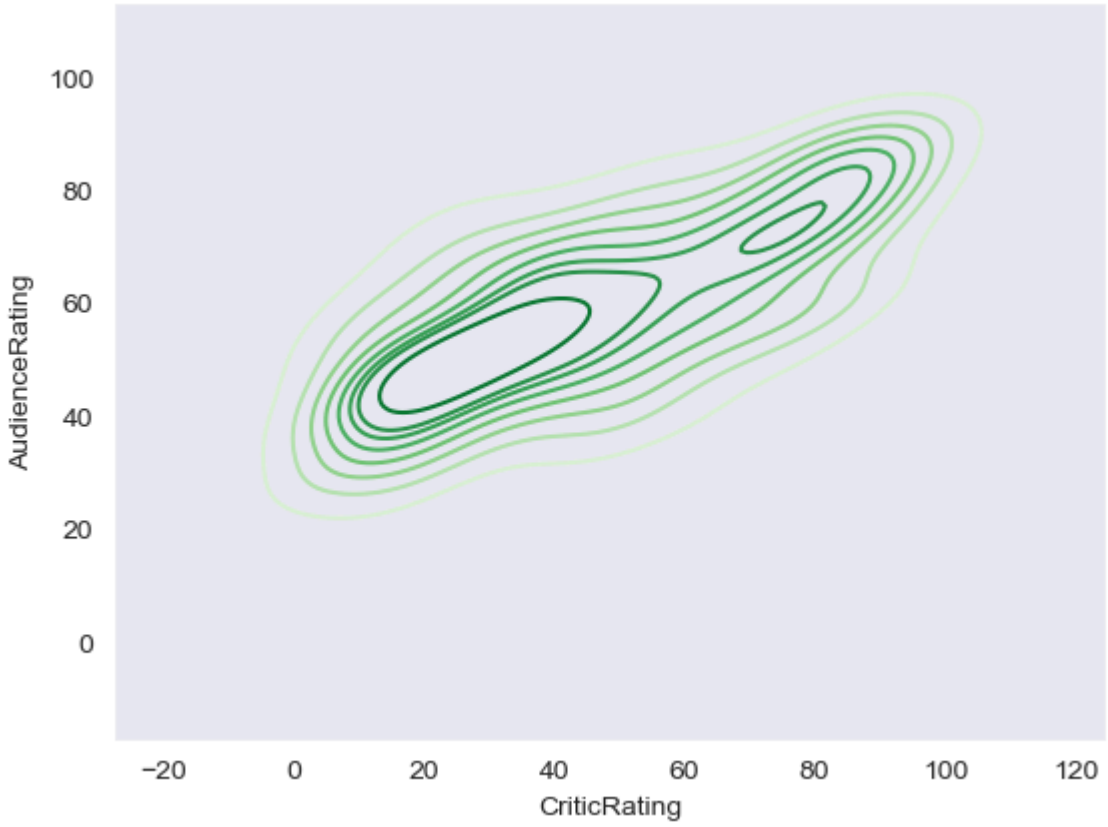
In [58]:
```
k1 = sns.kdeplot(x='CriticRating',y='AudienceRating',data = movies)
# where do u find more density and how density is distibuted across from the the
# center point is kernal this is calld KDE & insteade of dots it visualize like
# we can able to clearly see the spread at the audience ratings
```



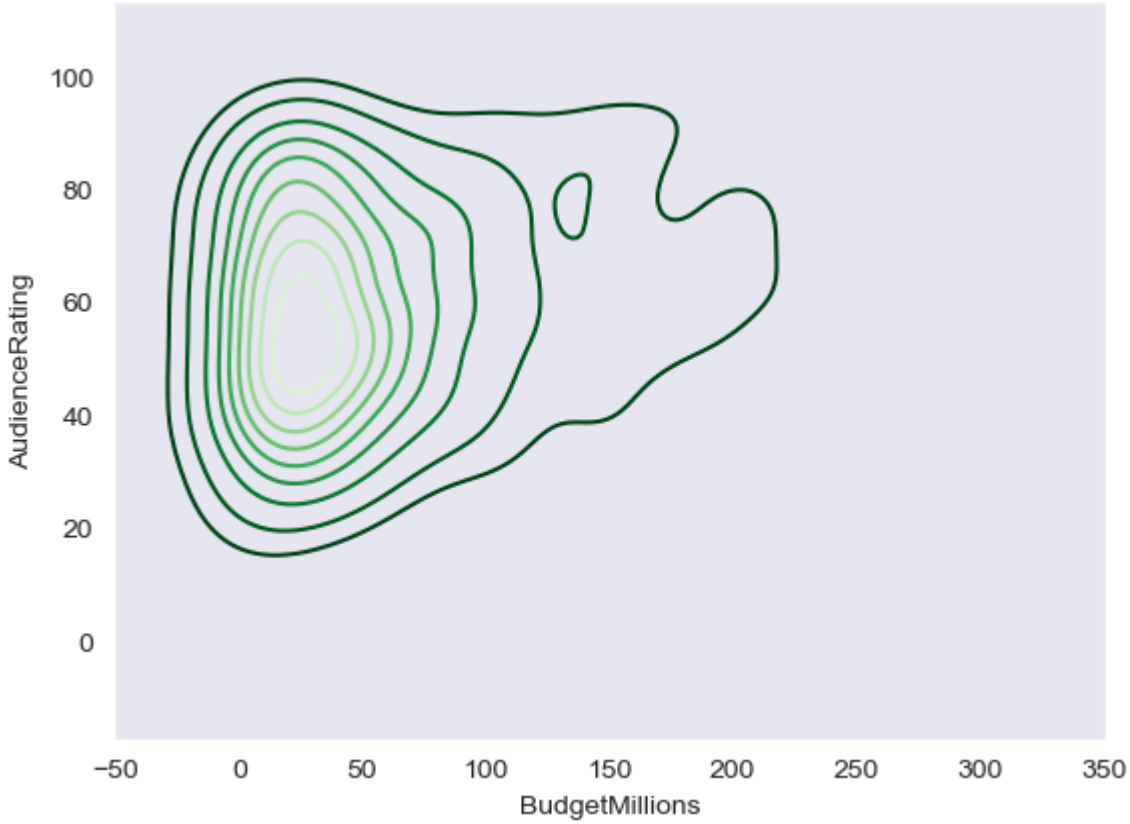

In [59]:
```
k1 = sns.kdeplot(x='CriticRating',y='AudienceRating',data = movies,shade = True,
```



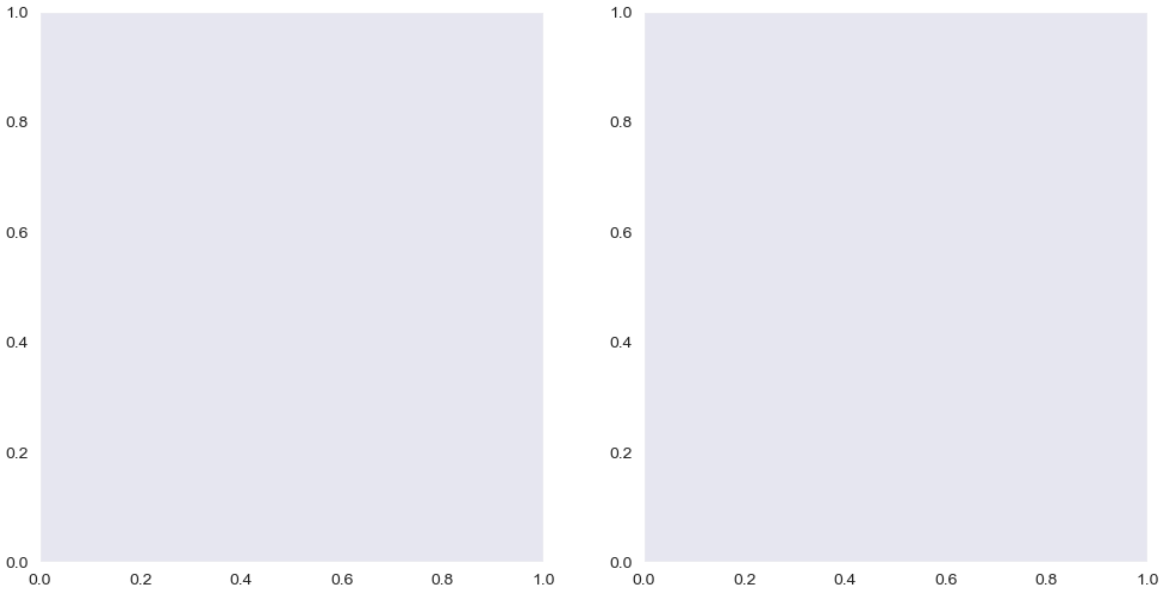

In [60]:
```
k1 = sns.kdeplot(x='CriticRating',y='AudienceRating',data = movies,shade = False
```



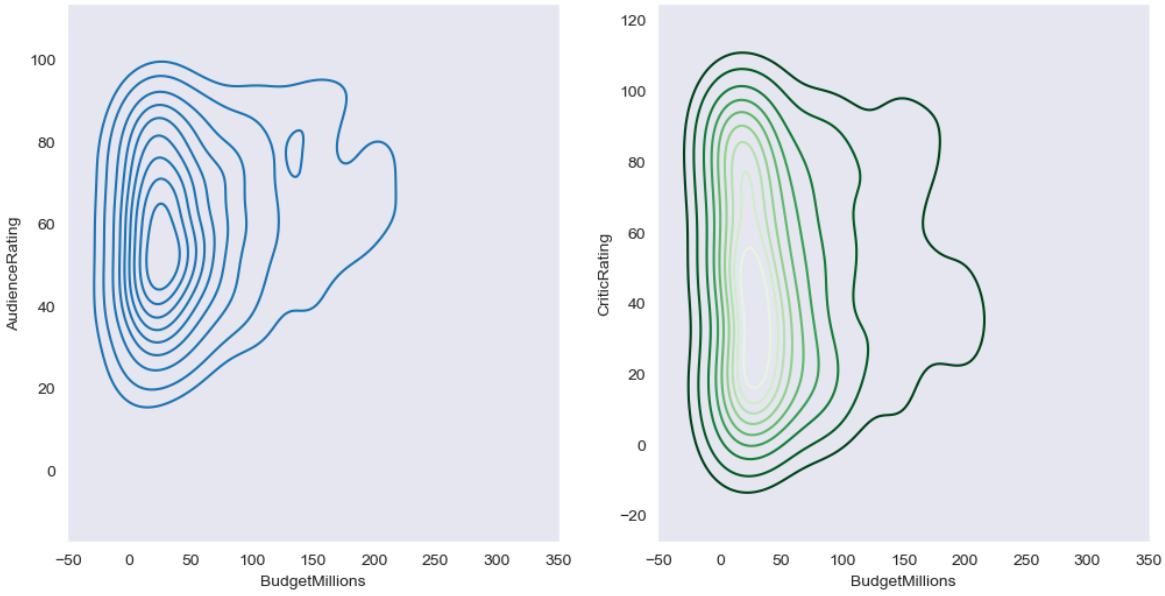

In [61]:
```
k2 = sns.kdeplot(x='BudgetMillions',y='AudienceRating',data = movies,shade_lowes
```




In [62]:
```
f, ax = plt.subplots(1,2, figsize =(12,6))
#f, ax = plt.subplots(3,3, figsize =(12,6))
```

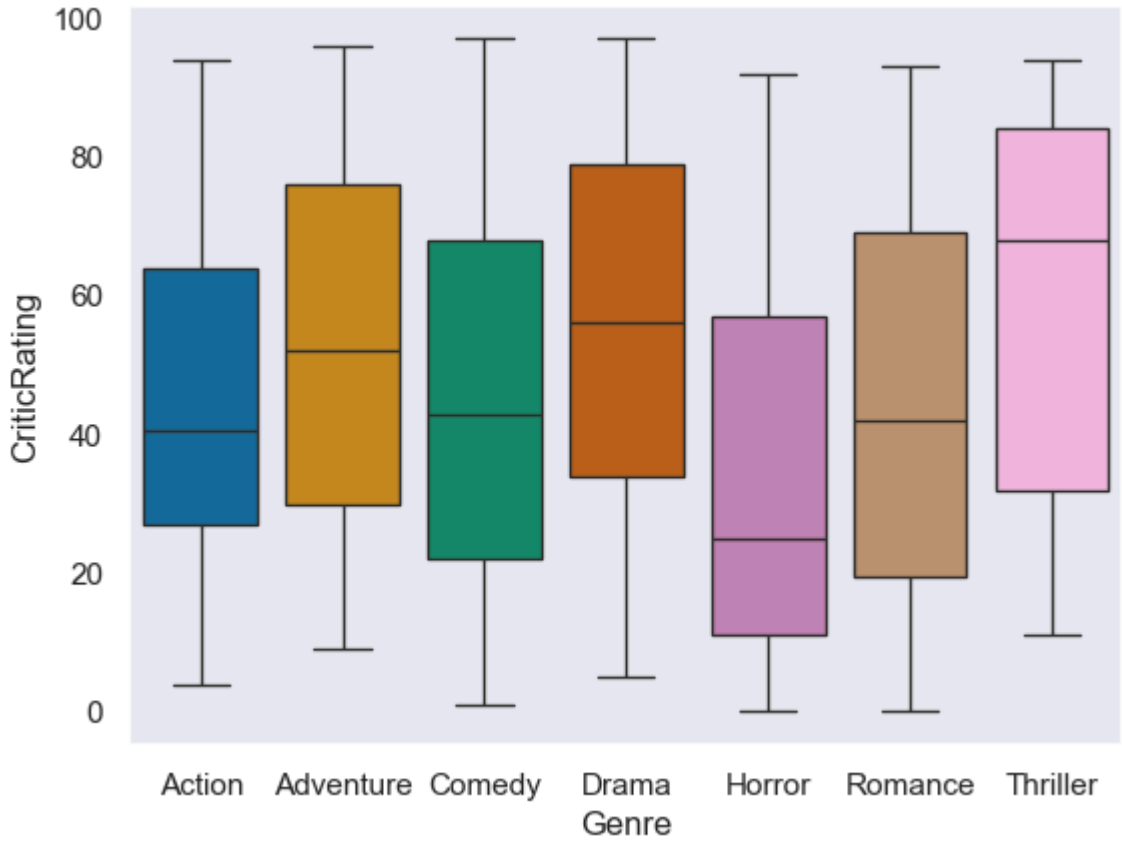



In [63]:
```
f, axes = plt.subplots(1,2, figsize =(12,6))
k1 = sns.kdeplot(x='BudgetMillions',y='AudienceRating',data = movies,ax=axes[0])
k2 = sns.kdeplot(x='BudgetMillions',y='CriticRating',data = movies,shade_lowest=
```



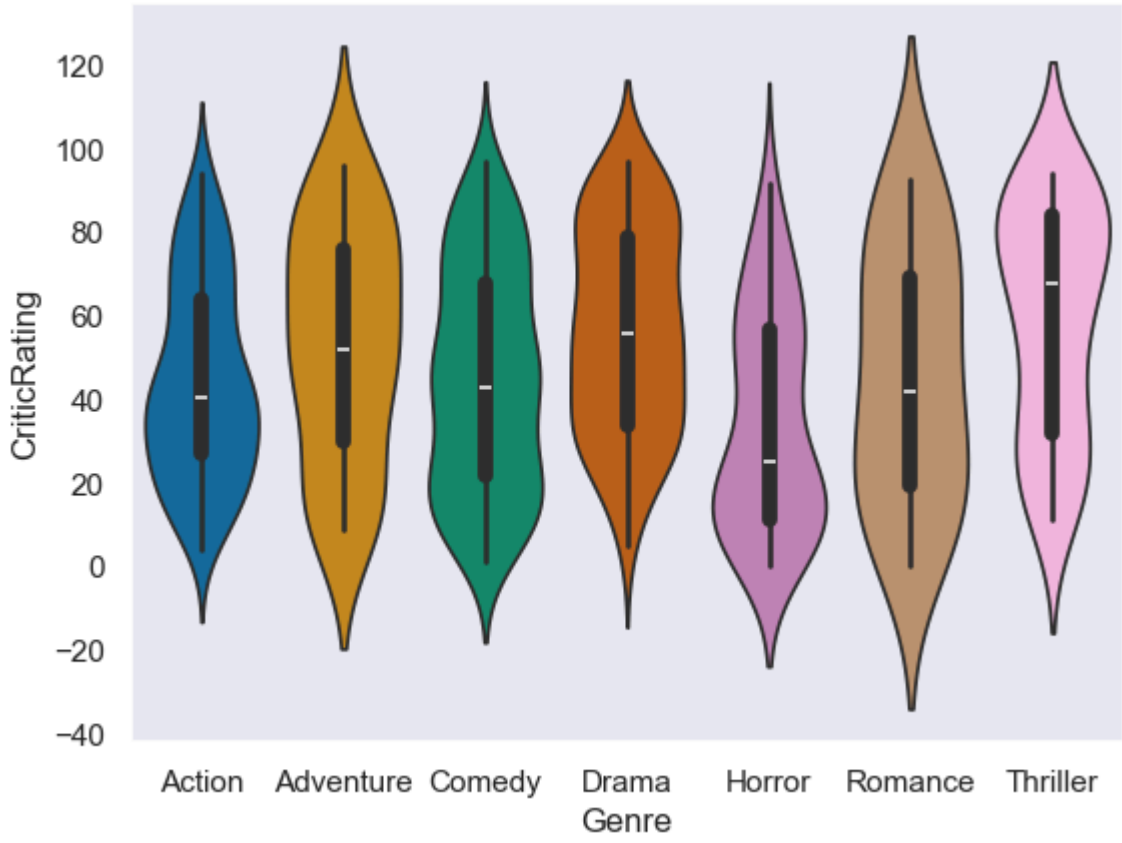

## Boxplot

In [64]:
```
sns.set(style="dark")
w = sns.boxplot(data=movies, x='Genre', y = 'CriticRating',palette='colorblind')
```

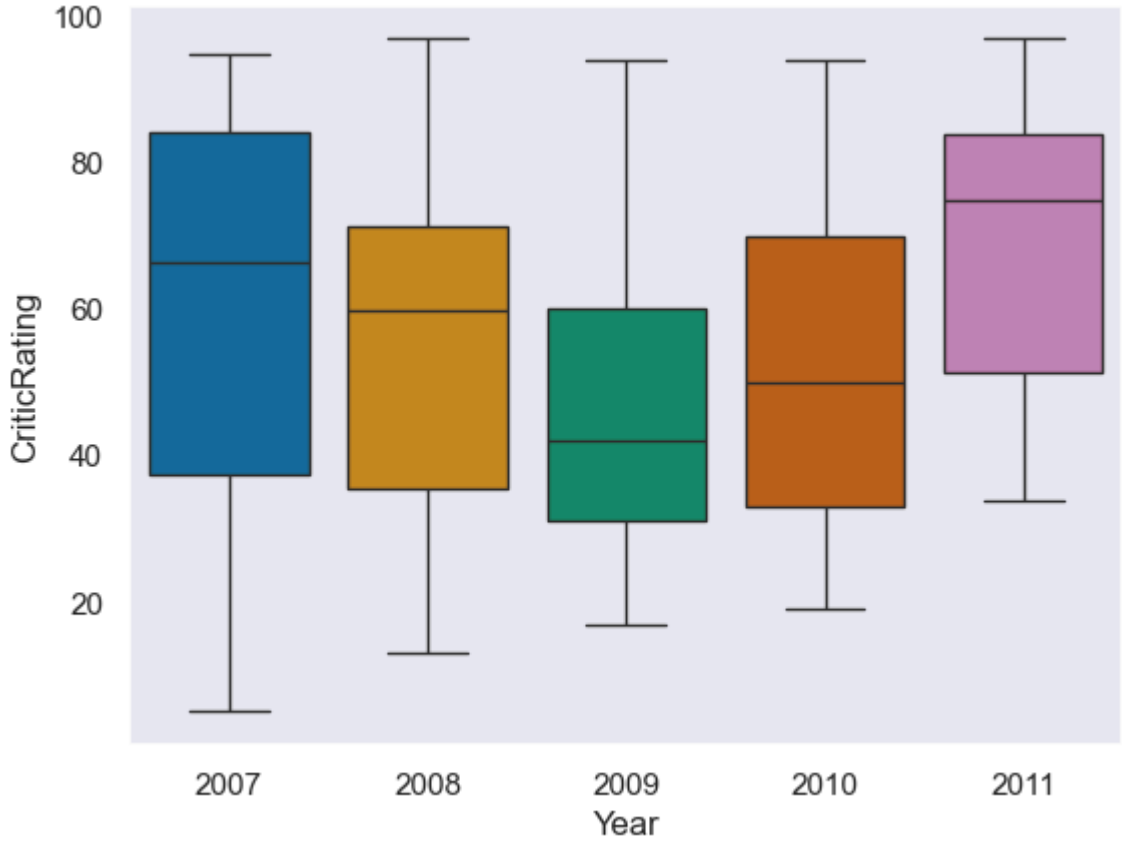



## Violin plot

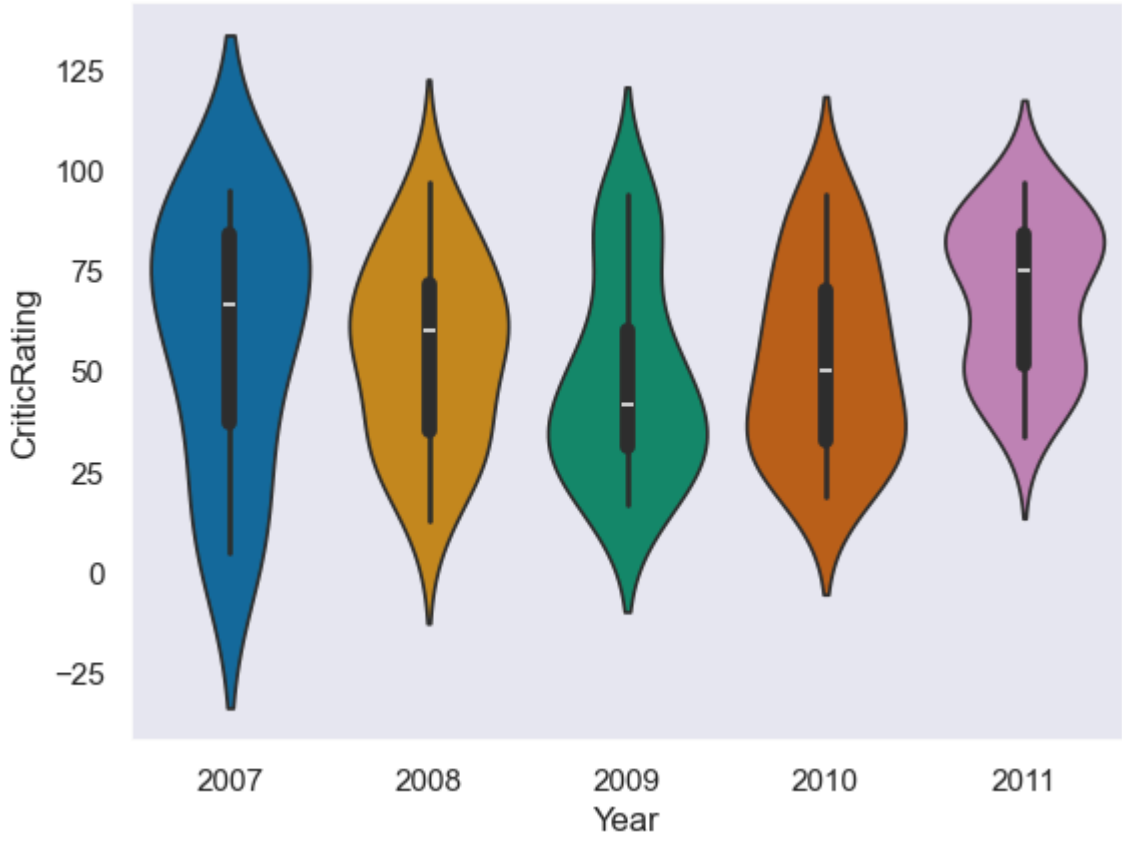
In [65]:
```
z = sns.violinplot(data=movies, x='Genre', y = 'CriticRating',palette='colorblin
```




In [66]:
```
w1 = sns.boxplot(data=movies[movies.Genre == 'Drama'], x='Year', y = 'CriticRati
```



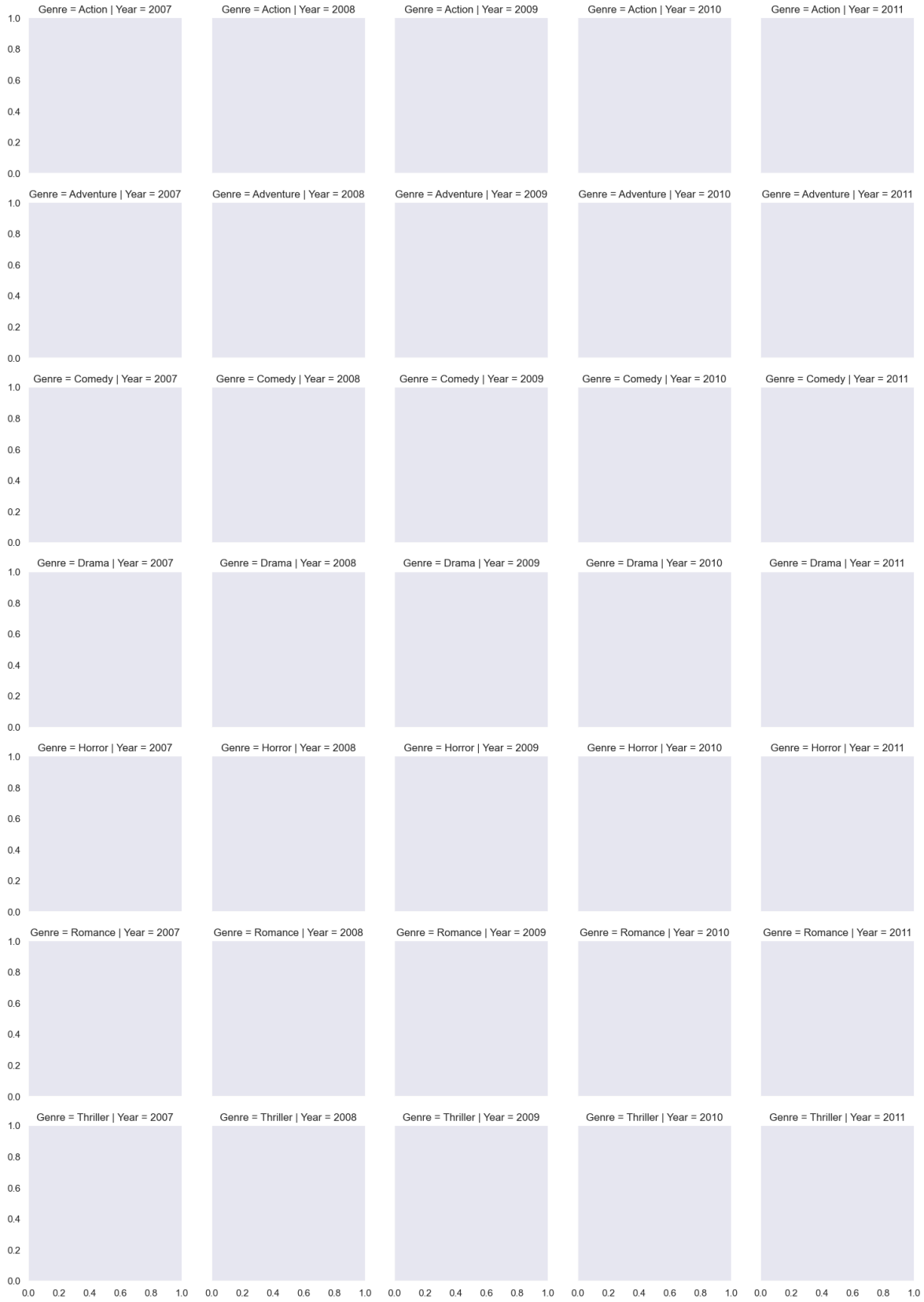

In [67]:
```
z = sns.violinplot(data=movies[movies.Genre == 'Drama'], x='Year', y = 'CriticRa
```




## Facetgrid

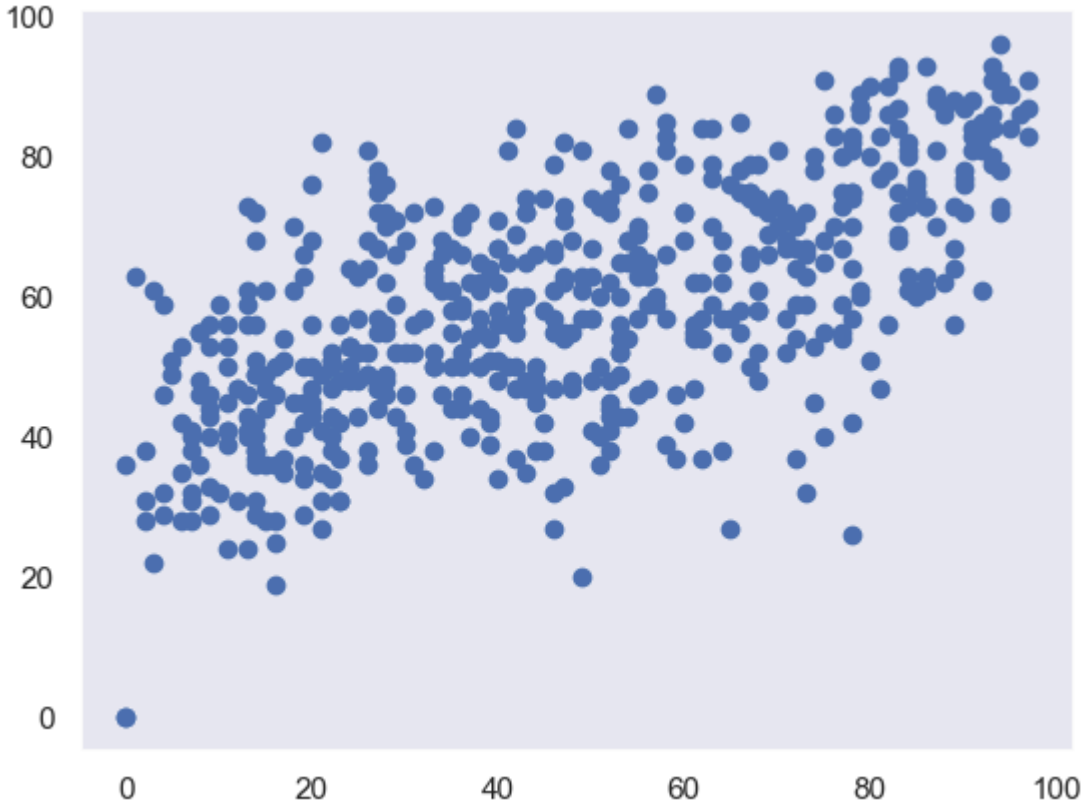
Multi-plot grid for plotting conditional relationships.

In [68]:
```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre') #kind of s
```

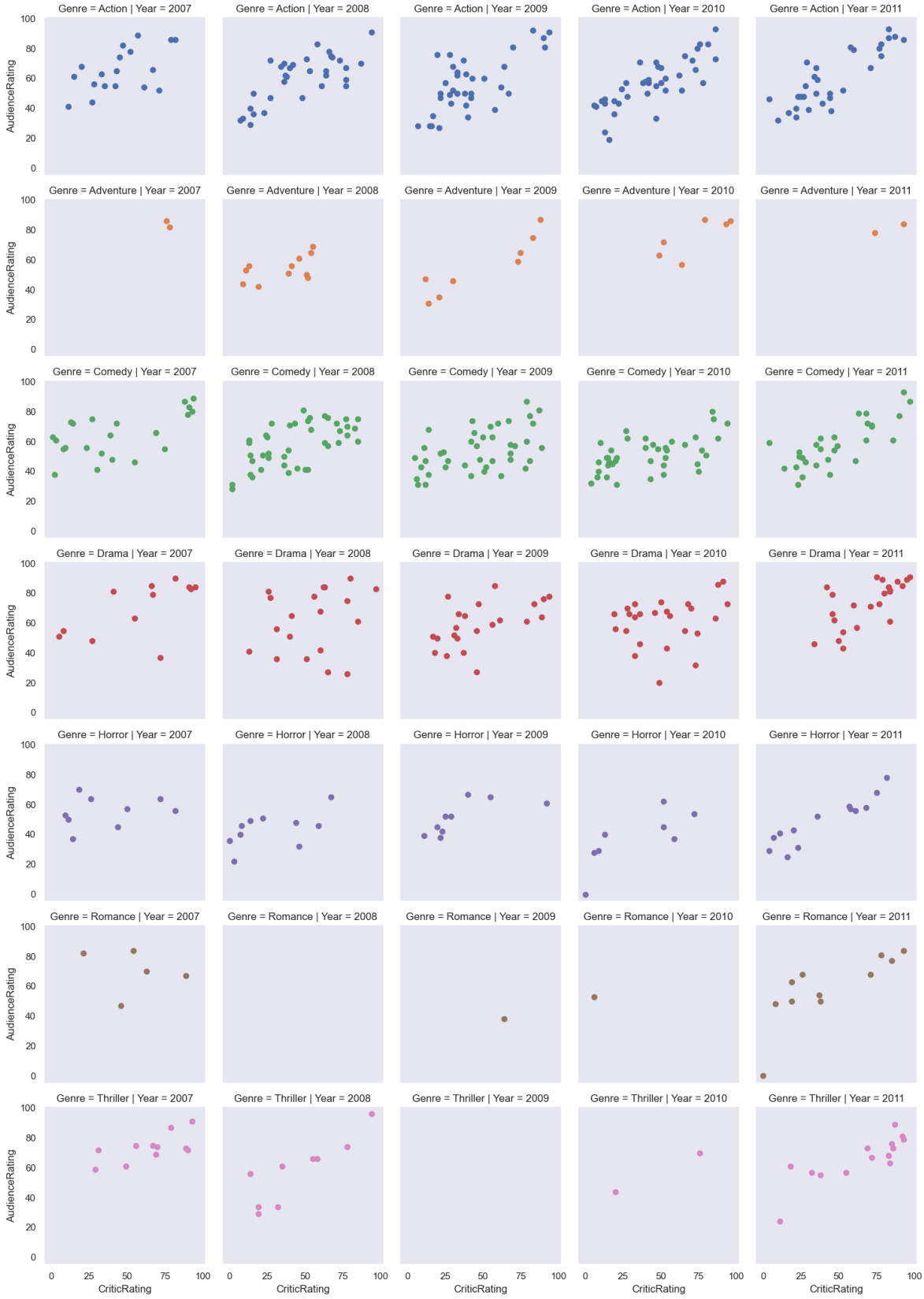



In [69]:
```
plt.scatter(movies.CriticRating,movies.AudienceRating)
```

Out[69]:
```
<matplotlib.collections.PathCollection at 0x17a3ee99730>
```




In [70]:
```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre')
g = g.map(plt.scatter, 'CriticRating', 'AudienceRating' )
```




row='Genre': This specifies that the rows of the facet grid will be divided by the 'Genre' column. Each row will display data for a specific genre.

col='Year': This specifies that the columns of the facet grid will be divided by the 'Year' column. Each column will display data for a specific year.

'CriticRating': This indicates the x-axis variable (horizontal axis) for the scatter plot, which is the Critic Rating.

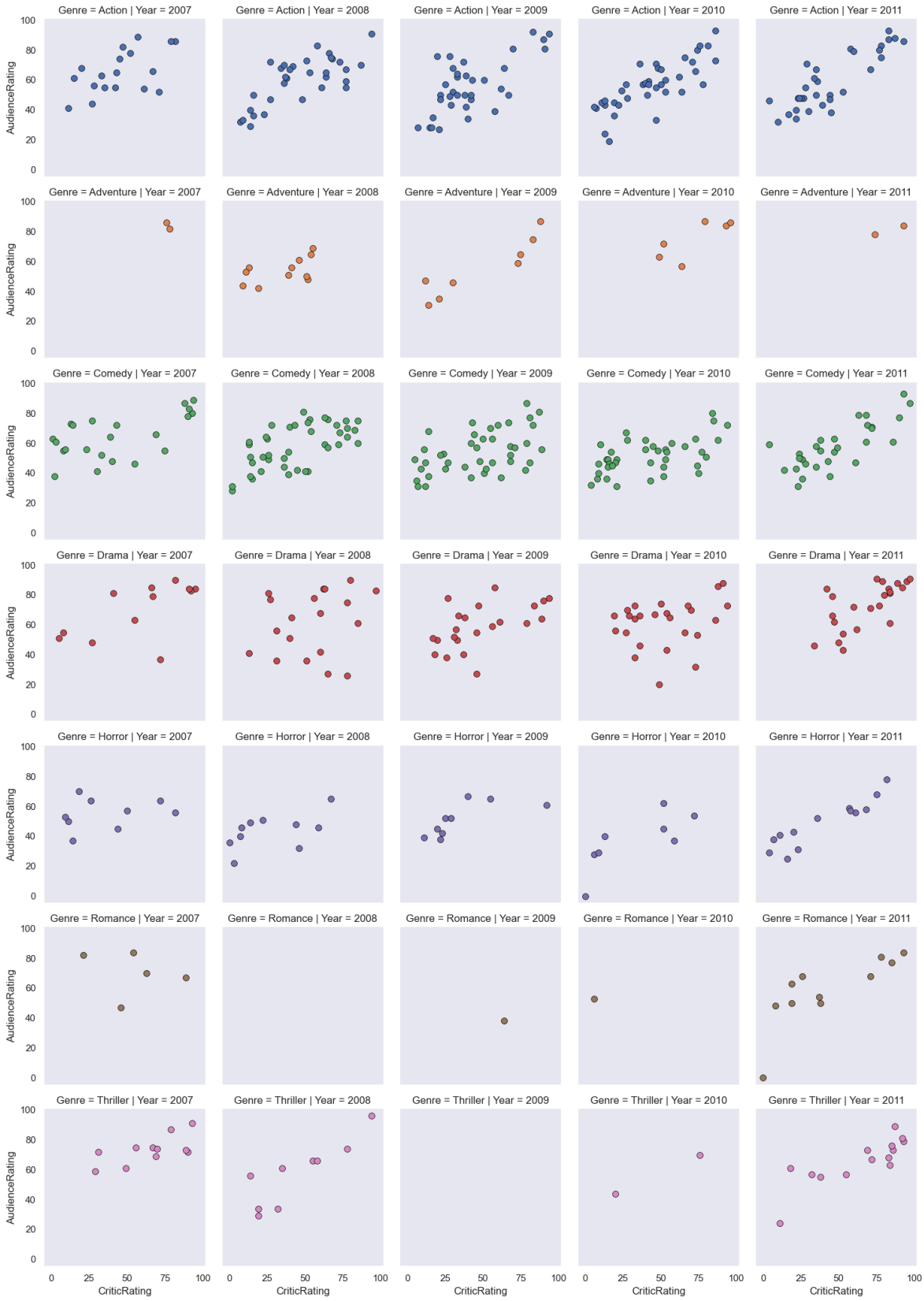
'AudienceRating': This indicates the y-axis variable (vertical axis) for the scatter plot, which is the Audience Rating.

this code creates a grid of scatter plots where each plot represents a combination of Genre and Year. Each data point in a plot shows the Critic Rating and Audience Rating for a particular movie.

The coloring based on Genre helps visualize how the relationship between these ratings may differ across genres.

In [71]:
```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre')
g = g.map(plt.hist, 'BudgetMillions') #scatterplots are mapped in facetgrid
```


In [72]:
```
# FacetGrid with scatter plots
g = sns.FacetGrid(movies, row='Genre', col='Year', hue='Genre')
kws = dict(s=50, linewidth=0.5, edgecolor='black')
g = g.map(plt.scatter, 'CriticRating', 'AudienceRating', **kws)

plt.show()
```

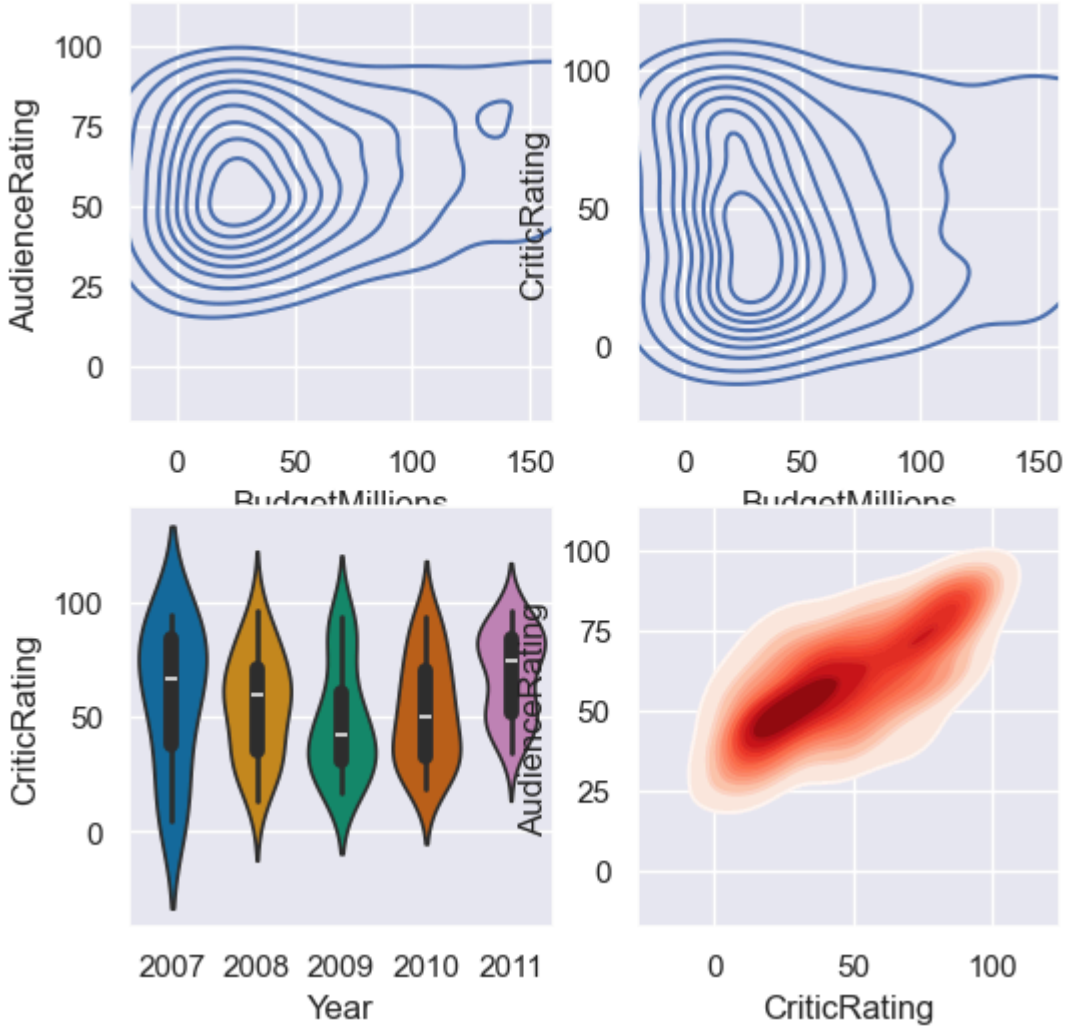



This line defines a dictionary named kws. Dictionaries are used to store key-value pairs. s=50: This key-value pair sets the marker size for the scatter plots to 50. The s parameter in plt.scatter controls the size of the markers.

linewidth=0.5: This sets the line width of the markers' edges to 0.5. The linewidth parameter controls the thickness of the lines around the markers.

edgecolor='black': This sets the color of the markers' edges to black. The edgecolor parameter specifies the color for the border around the markers.

In [73]:
```
# python is not vectorize programming language
# Building dashboards (dashboard - combination of chats)

sns.set_style('darkgrid')
f, axes = plt.subplots (2,2, figsize = (6,6))

k1 = sns.kdeplot(x='BudgetMillions',y='AudienceRating',data=movies,ax=axes[0,0])
k2 = sns.kdeplot(x='BudgetMillions',y='CriticRating',data=movies,ax = axes[0,1])

k1.set(xlim=(-20,160))
k2.set(xlim=(-20,160))

z = sns.violinplot(data=movies[movies.Genre=='Drama'], x='Year', y = 'CriticRati

k4 = sns.kdeplot(x='CriticRating',y='AudienceRating',data=movies,shade = True,sh
k4b = sns.kdeplot(x='CriticRating',y='AudienceRating',data=movies,cmap='Reds',ax

plt.show()
```




In [74]:
```
sns.set_style('dark', {'axes.facecolor': 'black'})

# Create a figure and subplots
f, axes = plt.subplots(2, 2, figsize=(6, 6))

# Budget Millions vs. Audience Rating (top-left)
k1 = sns.kdeplot(
    x='BudgetMillions', y='AudienceRating', data=movies, shade=True, cmap='virid
```

```
)
k1.set(xlim=(-20, 160))  # Set x-axis limits for both plots

# Budget Millions vs. Critic Rating (top-right)
k2 = sns.kdeplot(
    x='BudgetMillions', y='CriticRating', data=movies, shade=True, cmap='plasma'
)
k2.set(xlim=(-20, 160))

# Violin Plot for Drama Movies (bottom-left)
z = sns.violinplot(data=movies[movies.Genre == 'Drama'], x='Year', y='CriticRati

# Critic Rating vs. Audience Rating (bottom-right) with highlight for high ratin
k4 = sns.kdeplot(
    x='CriticRating', y='AudienceRating', data=movies, shade=True, shade_lowest=
)
k4b = sns.kdeplot(x='CriticRating', y='AudienceRating', data=movies, cmap='Greys

plt.tight_layout()  # Adjust spacing between subplots
plt.show()
```