MOVIE RATING ANALYTICS (ADVANCED VISULIZATION)

In [3]:
```
import pandas as pd
import os
```

In [5]:
```
os.getcwd() # if you want to change the working directory
```

Out[5]:
```
'C:\\Users\\siddharth.bose'
```

In [9]:
```
movies=pd.read_csv(r"D:\Sid 17-03-2025\SIDDHARTH BOSE\FSDS & GEN AI\March\28th -
```

In [11]:
```
movies
```

Out[11]:

	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 [13]:
```
len(movies)
```

Out[13]:
```
559
```

In [15]:
```
movies.head()
```

Out[15]:

	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 [17]:
```
movies.tail()
```

Out[17]:

	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 [19]:
```
movies.columns
```

Out[19]:
```
Index(['Film', 'Genre', 'Rotten Tomatoes Ratings %', 'Audience Ratings %',
       'Budget (million $)', 'Year of release'],
      dtype='object')
```

In [21]:
```
movies.columns = ['Film', 'Genre', 'CriticRating', 'AudienceRating','BudgetMilli
```

In [23]:
```
movies.head() # Removed spaces & % removed noise characters
```

Out[23]:

	Film	Genre	CriticRating	AudienceRating	BudgetMillions	Year
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 [25]:
```
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   CriticRating    559 non-null    int64 
 3   AudienceRating  559 non-null    int64 
 4   BudgetMillions  559 non-null    int64 
 5   Year            559 non-null    int64 
dtypes: int64(4), object(2)
memory usage: 26.3+ KB
```

In [27]:

```
movies.describe()
# if you look at the year the data type is int but when you look at the mean val
# we have to change to categroy type
# also from object datatype we will convert to category datatypes
#
```

Out[27]:

	CriticRating	AudienceRating	BudgetMillions	Year
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 [29]:

```
movies['Film']
#movies['Audience Ratings %']
```

Out[29]:

```
0      (500) Days of Summer 
1                10,000 B.C.
2                 12 Rounds 
3                  127 Hours
4                 17 Again  
               ...          
554            Your Highness
555          Youth in Revolt
556                   Zodiac
557              Zombieland 
558               Zookeeper 
Name: Film, Length: 559, dtype: object
```

In [31]:

```
movies.Film
```

Out[31]:
```
0      (500) Days of Summer
1                10,000 B.C.
2                 12 Rounds
3                  127 Hours
4                  17 Again
               ...
554            Your Highness
555          Youth in Revolt
556                   Zodiac
557              Zombieland
558                Zookeeper
Name: Film, Length: 559, dtype: object
```

In [33]:
```
movies.Film = movies.Film.astype('category')
```

In [35]:
```
movies.Film
```

Out[35]:
```
0      (500) Days of Summer
1                10,000 B.C.
2                 12 Rounds
3                  127 Hours
4                  17 Again
               ...
554            Your Highness
555          Youth in Revolt
556                   Zodiac
557              Zombieland
558                Zookeeper
Name: Film, Length: 559, dtype: category
Categories (559, object): ['(500) Days of Summer ', '10,000 B.C.', '12 Rounds
', '127 Hours', ..., 'Youth in Revolt', 'Zodiac', 'Zombieland ', 'Zookeeper']
```

In [37]:
```
movies.head()
```

Out[37]:

	Film	Genre	CriticRating	AudienceRating	BudgetMillions	Year
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 [39]:
```
movies.info()

# now the same thing we will change genra to category & year to category
```

```
<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 [41]:
```
movies.Genre = movies.Genre.astype('category')
movies.Year = movies.Year.astype('category')
```

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

Out[43]:
```
0         Comedy
1      Adventure
2         Action
3      Adventure
4         Comedy
         ...    
554       Comedy
555       Comedy
556     Thriller
557       Action
558       Comedy
Name: Genre, Length: 559, dtype: category
Categories (7, object): ['Action', 'Adventure', 'Comedy', 'Drama', 'Horror', 'R
omance', 'Thriller']
```

In [45]:
```
movies.Year # is it real no. year you can take average,min,max but out come have
```

Out[45]:
```
0      2009
1      2008
2      2009
3      2010
4      2009
       ... 
554    2011
555    2009
556    2007
557    2009
558    2011
Name: Year, Length: 559, dtype: category
Categories (5, int64): [2007, 2008, 2009, 2010, 2011]
```

In [47]:
```
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 [49]:

```
movies.Genre.cat.categories
```

Out[49]:

```
Index(['Action', 'Adventure', 'Comedy', 'Drama', 'Horror', 'Romance',
       'Thriller'],
      dtype='object')
```

In [51]:

```
movies.Year.cat.categories
```

Out[51]:

```
Index([2007, 2008, 2009, 2010, 2011], dtype='int64')
```

In [53]:

```
movies.describe()
#now when you see the describt you will get only integer value mean, standard de
```

Out[53]:

	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

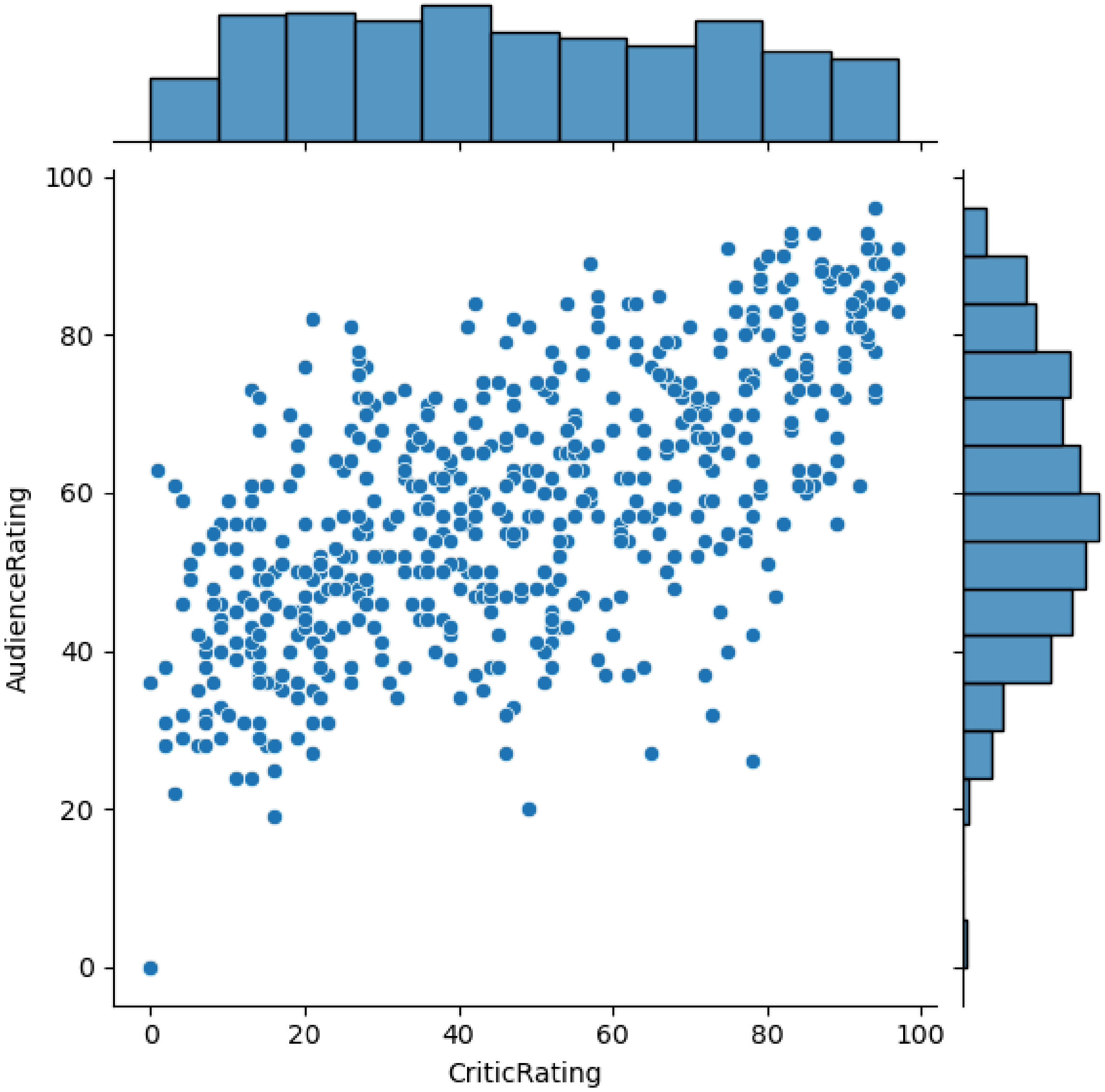
In [55]:

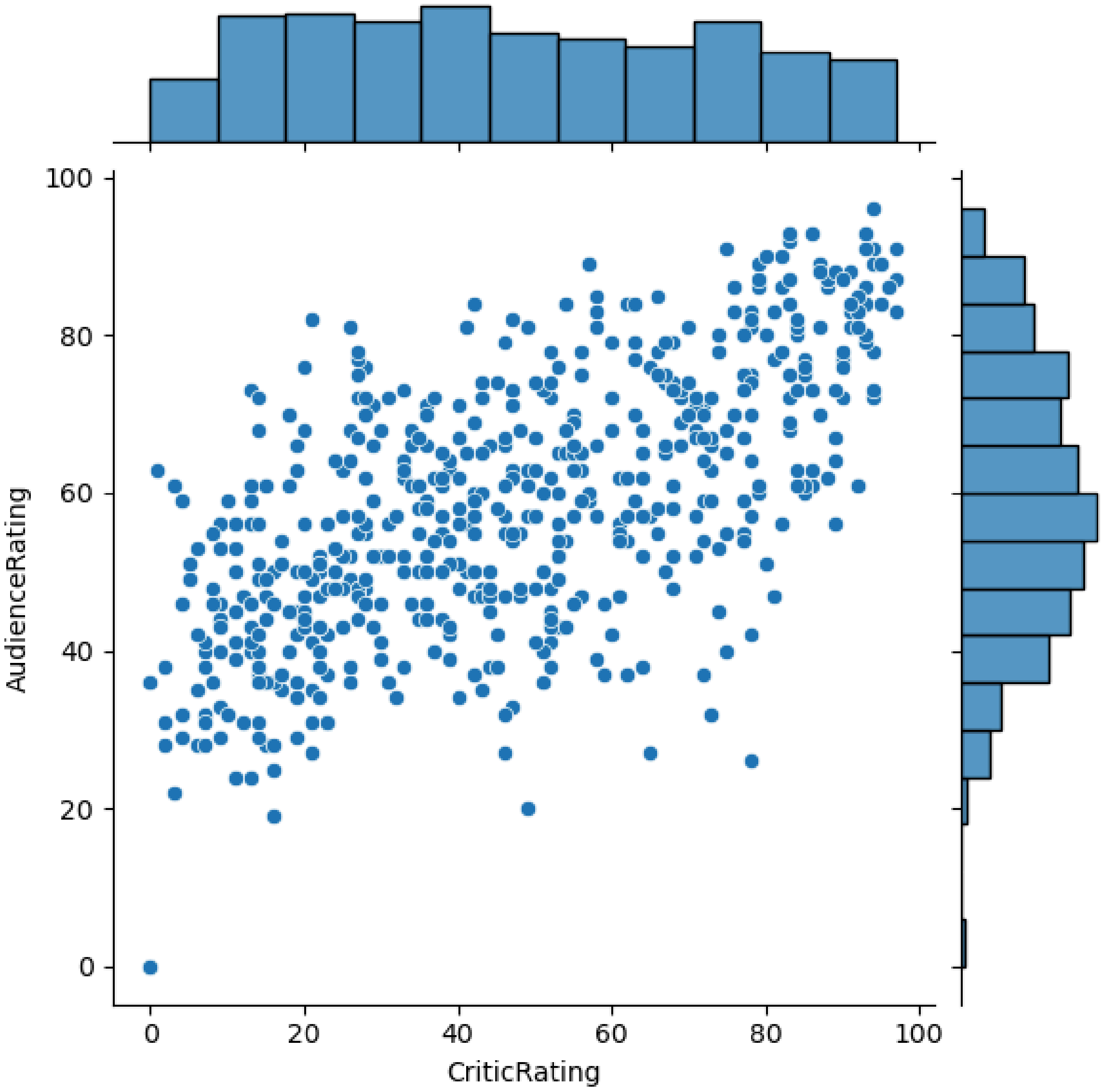
```
# How to working with joint plots

from matplotlib import pyplot as plt
import seaborn as sns
%matplotlib inline
import warnings
warnings.filterwarnings('ignore')
```

*basically joint plot is a scatter plot & it find the relation b/w audiene & critics

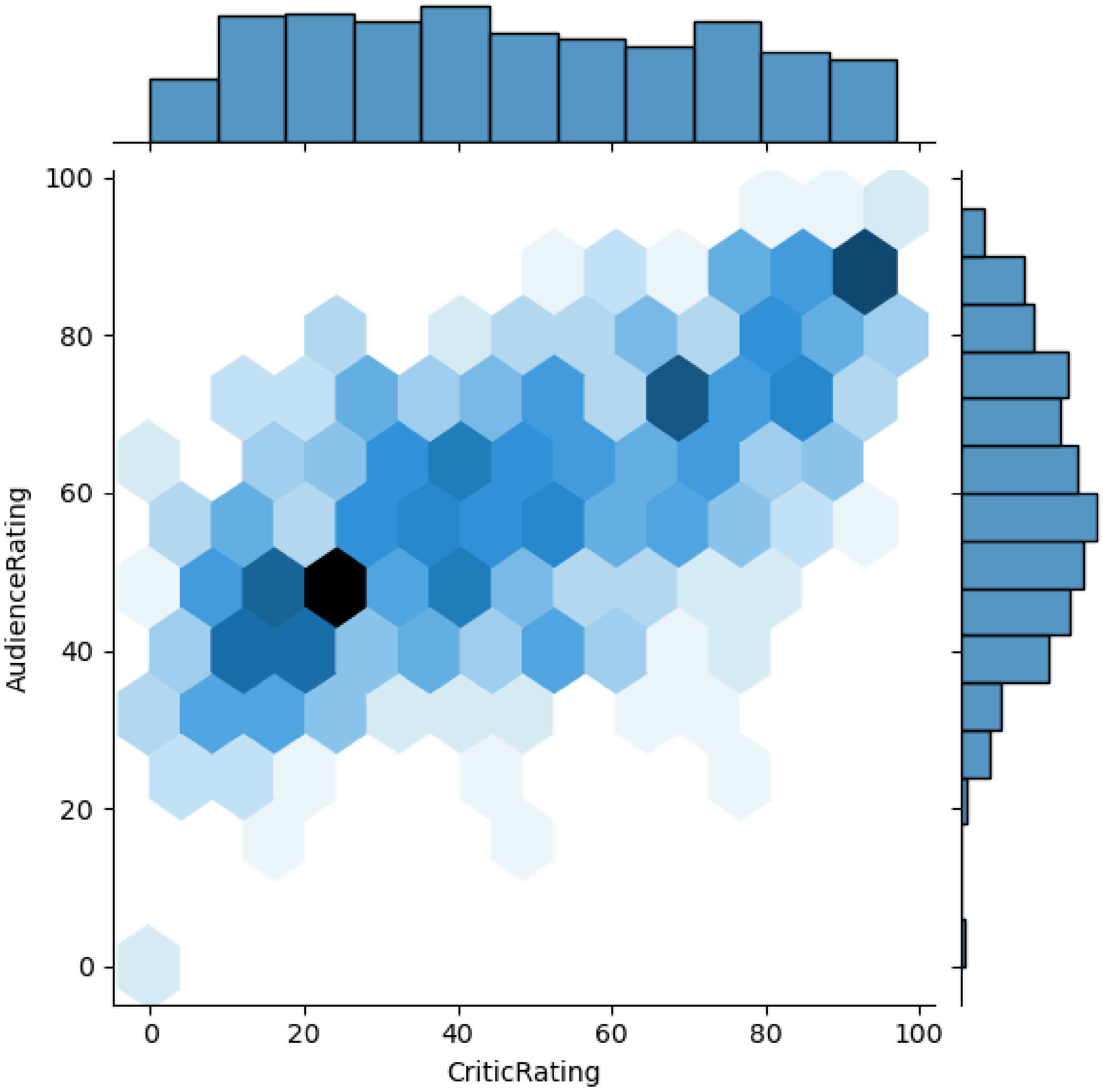
*also if you look up you can find the uniform distribution (critics)and normal distriution (audience)

In [63]:
```
j = sns.jointplot( data = movies, x = 'CriticRating', y = 'AudienceRating')
plt.show()
# Audience rating is more dominant then critics rating
# Based on this we find out as most people are most liklihood to watch audience
# let me explain the excel - if you filter audience rating & critic rating. crit
```

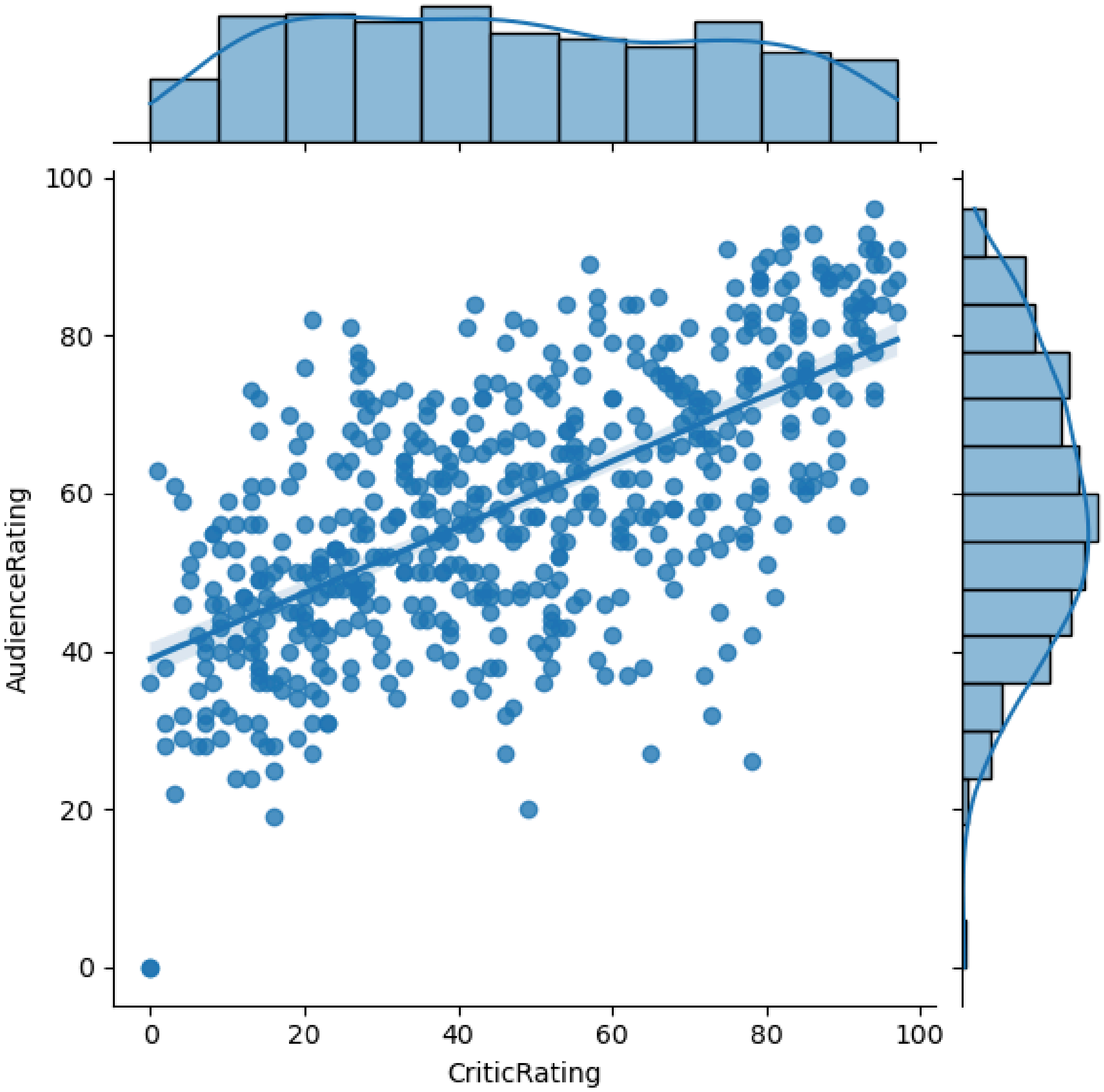




In [65]:
```
j = sns.jointplot( data = movies, x = 'CriticRating', y = 'AudienceRating', kind
plt.show()
#j = sns.jointplot( data = movies, x = 'CriticRating', y = 'AudienceRating', kin
```

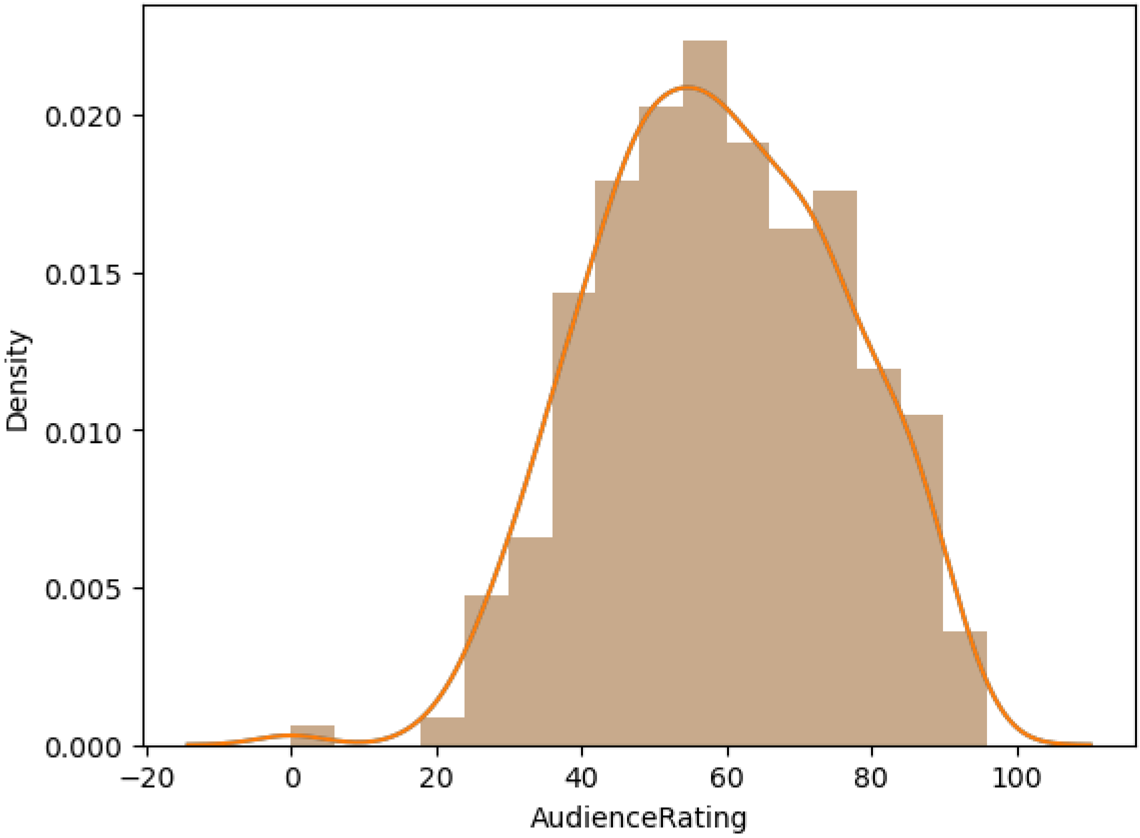


In [67]:
```
j = sns.jointplot( data = movies, x = 'CriticRating', y = 'AudienceRating', kind
plt.show()
```

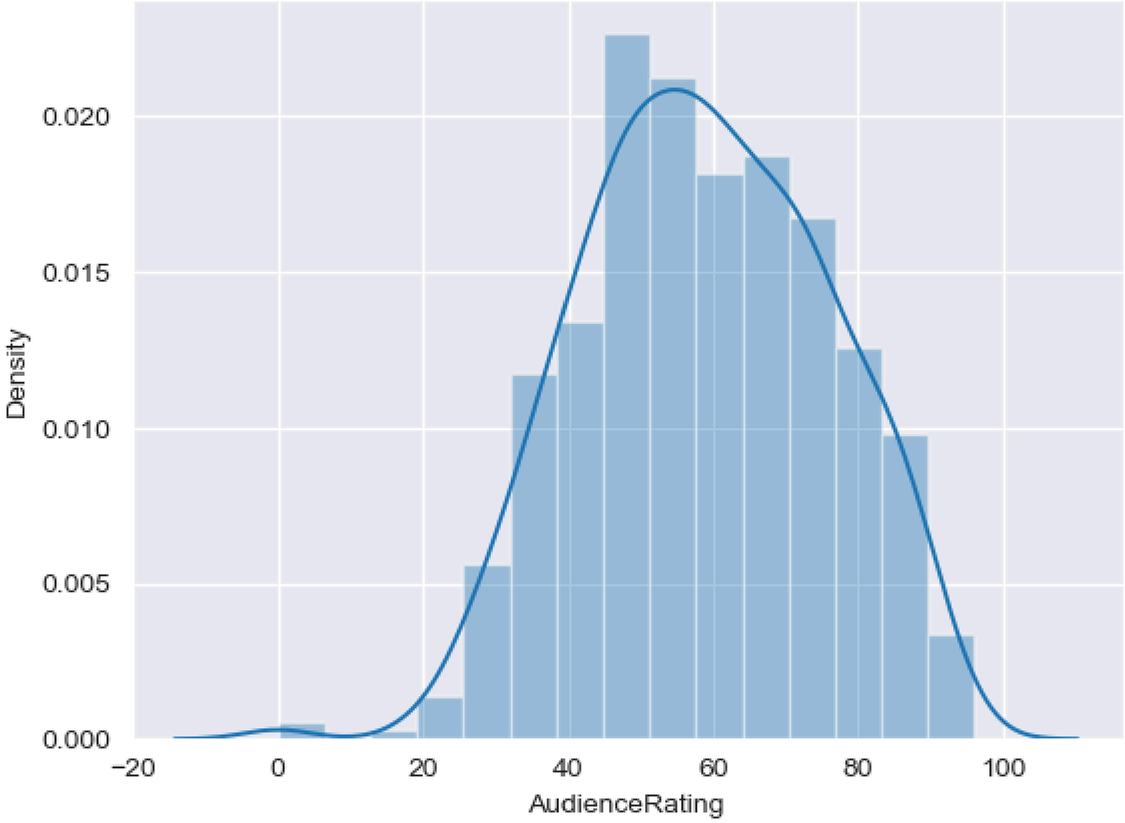


In [71]:

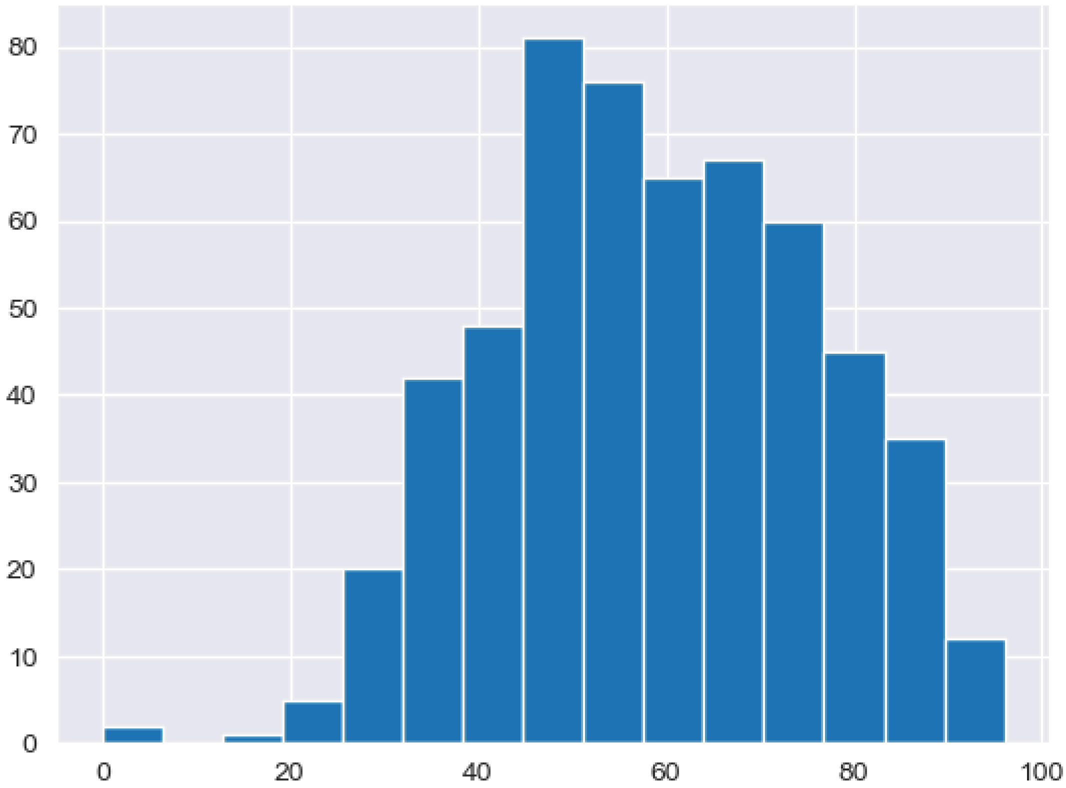
```
#Histograms

# <<< chat1

m1 = sns.distplot(movies.AudienceRating)
plt.show()

#y - axis generated by seaborn automatically that is the powefull of seaborn gal
```



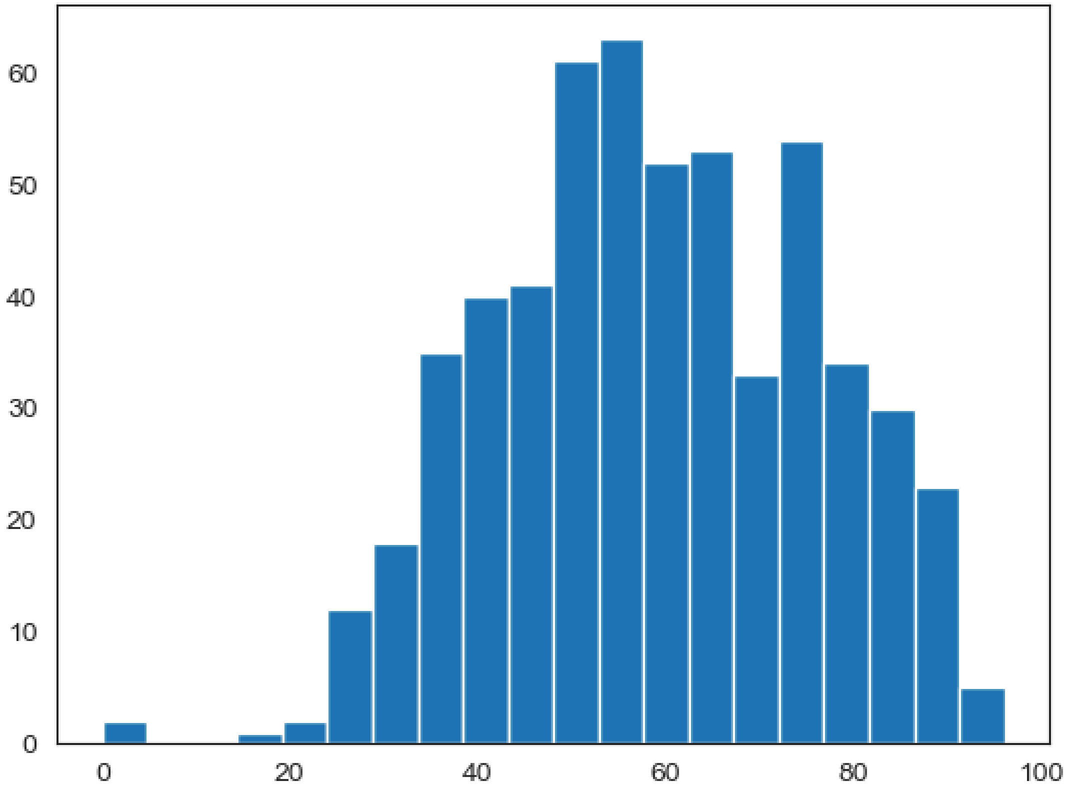
In [73]:
```
sns.set_style('darkgrid')
m2 = sns.distplot(movies.AudienceRating, bins = 15)
plt.show()
```



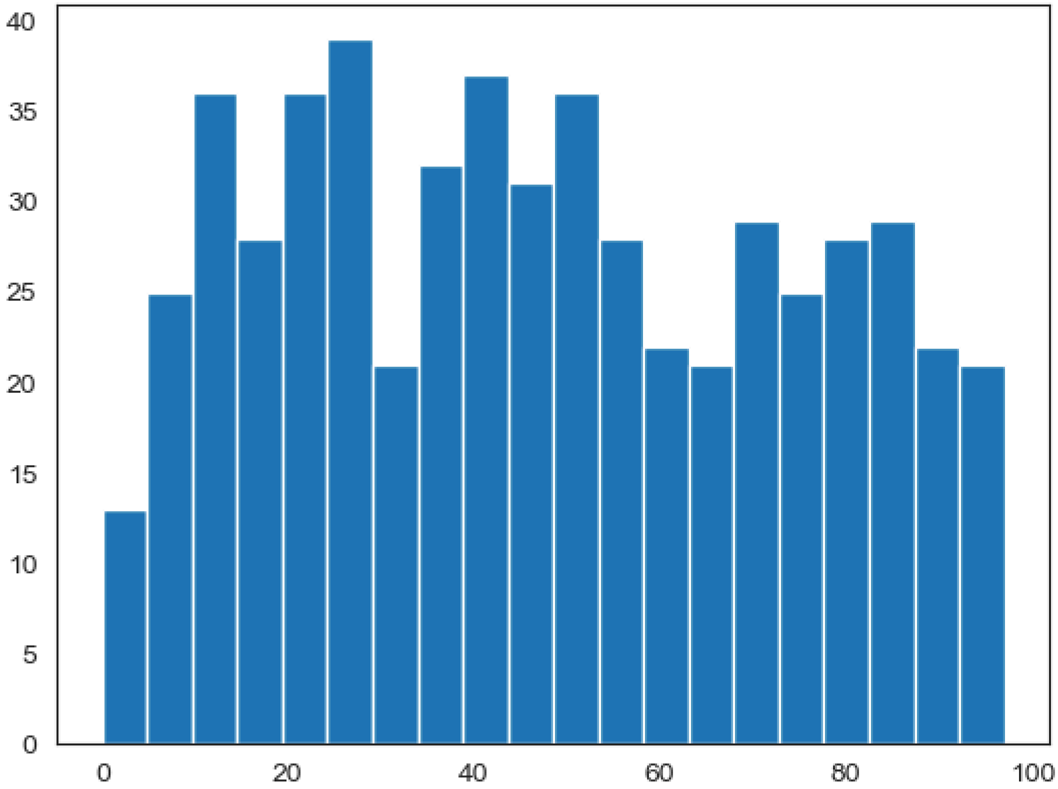
In [75]:
```
n1 = plt.hist(movies.AudienceRating, bins=15)
plt.show()
```



In [77]:
```
sns.set_style('white') #normal distribution & called as bell curve
n1 = plt.hist(movies.AudienceRating, bins=20)
plt.show()
```

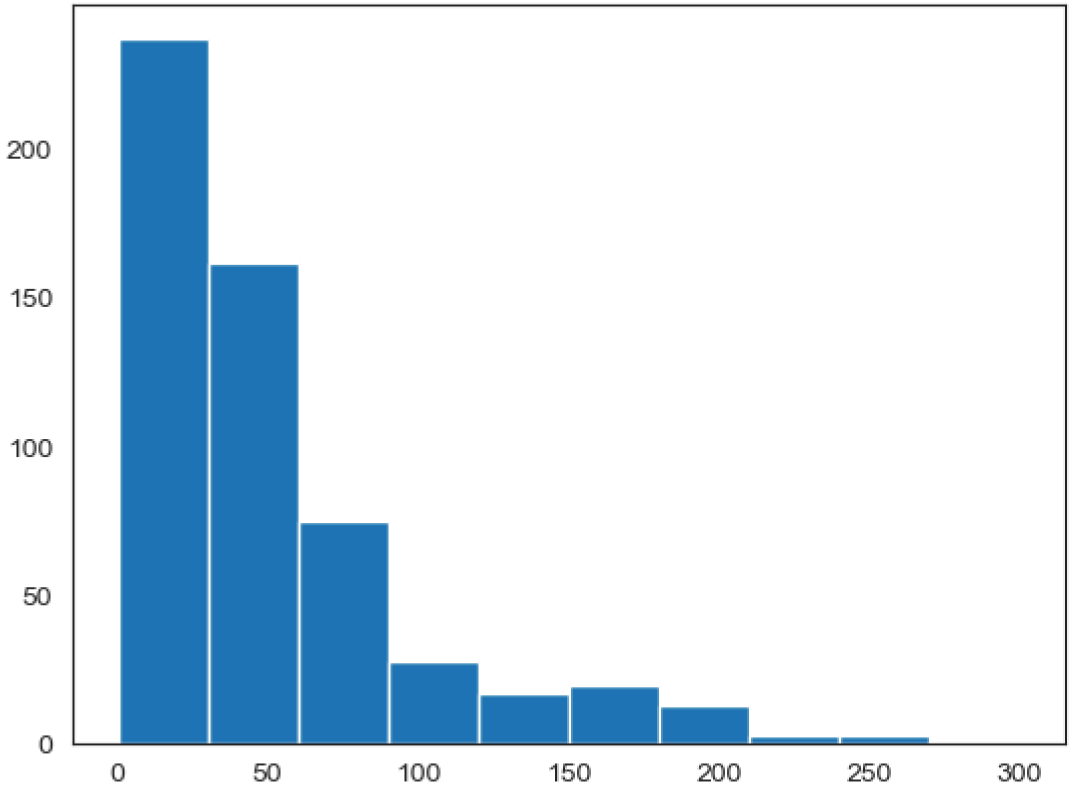


In [79]:
```
n1 = plt.hist(movies.CriticRating, bins=20) #uniform distribution
plt.show()
```

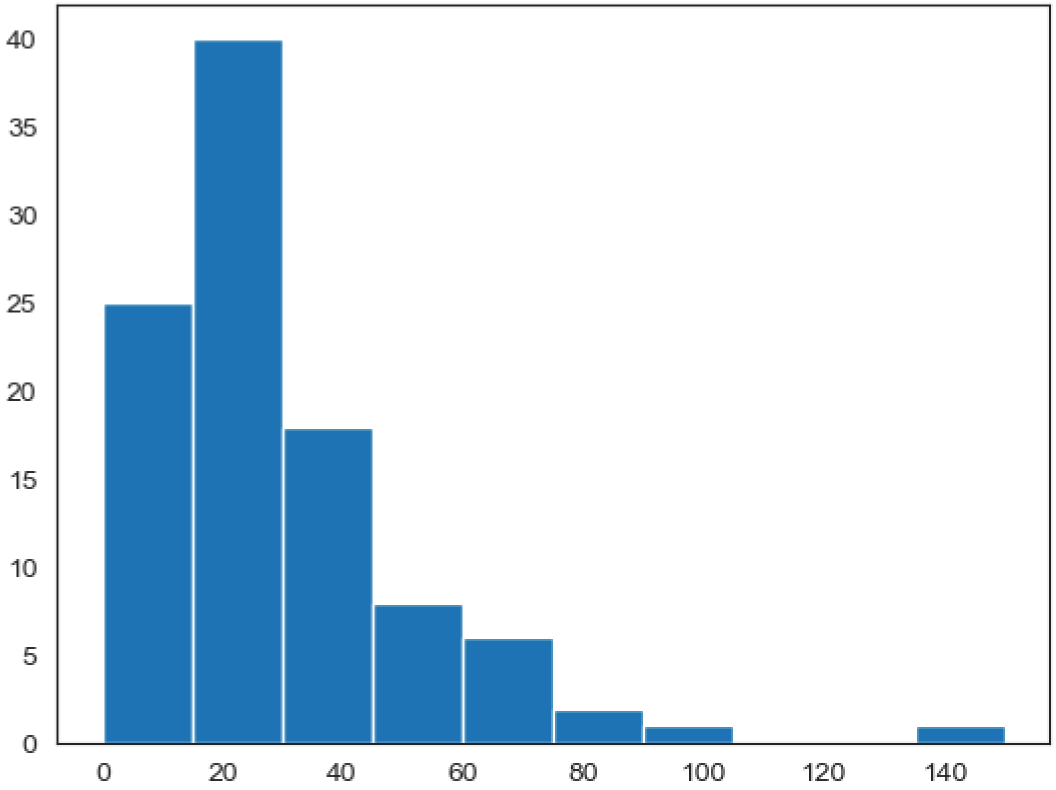


Creating stacked histograms

In [83]:
```
plt.hist(movies.BudgetMillions)
plt.show()
```



In [85]:
```
plt.hist(movies[movies.Genre == 'Drama'].BudgetMillions)
plt.show()
```



In [87]:

```
movies.head()
```

Out[87]:

	Film	Genre	CriticRating	AudienceRating	BudgetMillions	Year
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 [89]:

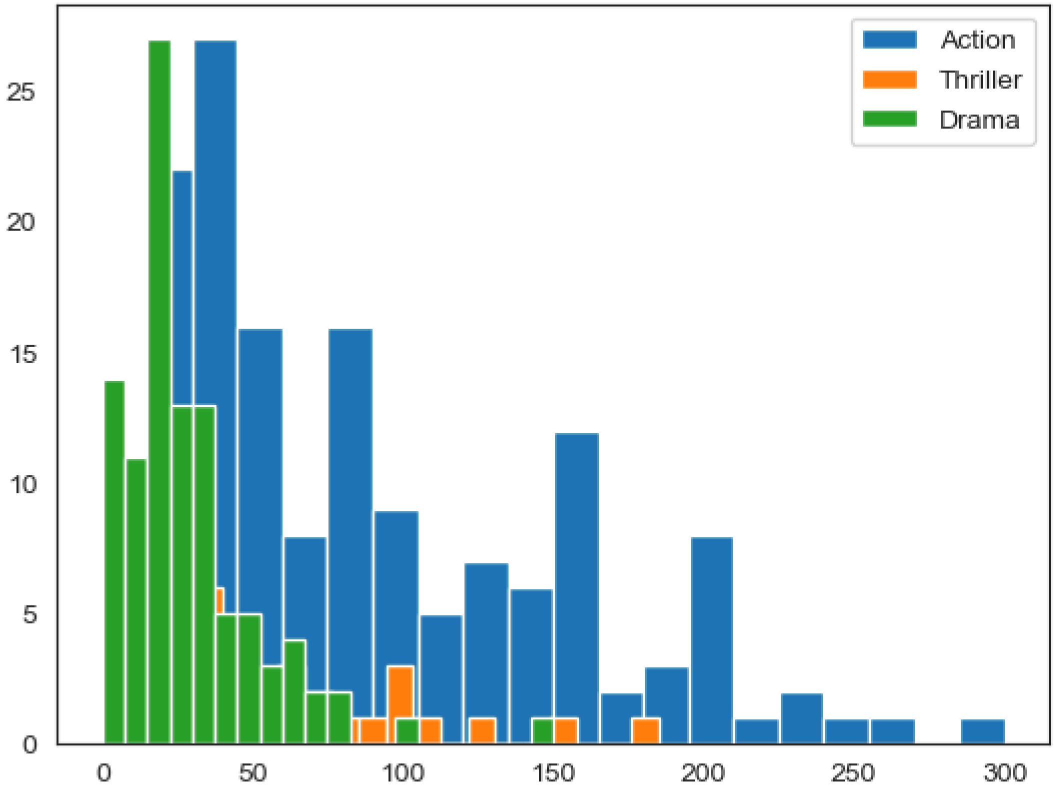
```
movies.Genre.unique()
```

Out[89]:

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

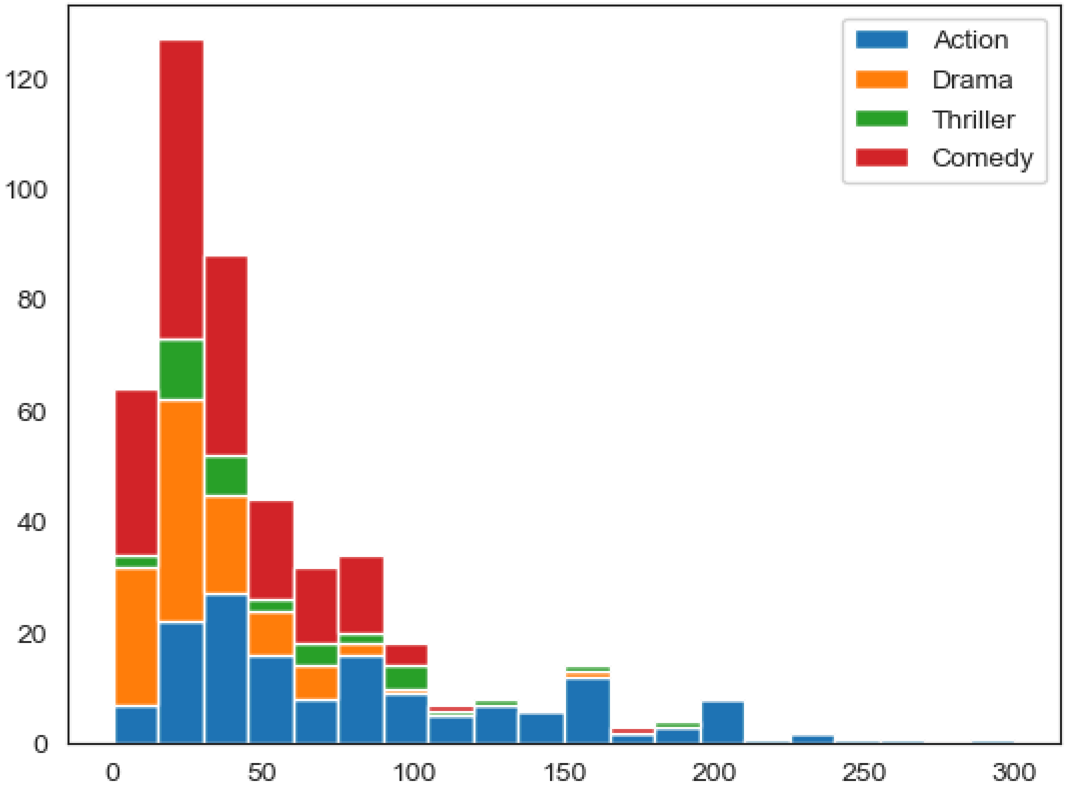
In [93]:

```
# Below plots are stacked histogram becuase overlaped

plt.hist(movies[movies.Genre == 'Action'].BudgetMillions, bins = 20, label='Acti
plt.hist(movies[movies.Genre == 'Thriller'].BudgetMillions, bins = 20, label='Th
plt.hist(movies[movies.Genre == 'Drama'].BudgetMillions, bins = 20, label='Drama
plt.legend()
plt.show()
```



In [105…

```
plt.hist([movies[movies.Genre == 'Action'].BudgetMillions, \
          movies[movies.Genre == 'Drama'].BudgetMillions, \
          movies[movies.Genre == 'Thriller'].BudgetMillions, \
          movies[movies.Genre == 'Comedy'].BudgetMillions],
         bins = 20, label=['Action','Drama','Thriller','Comedy'],stacked = True)
plt.legend()
plt.show()
```



In [107…

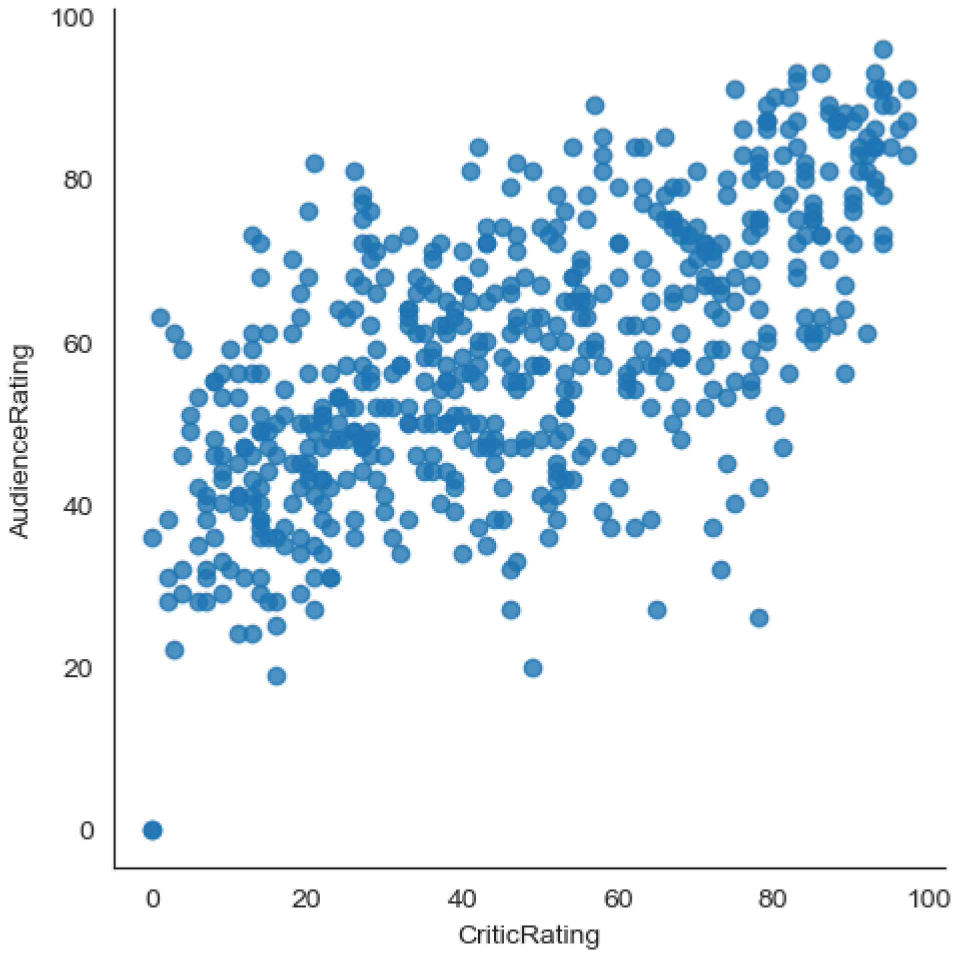
```
# if you have 100 categories you cannot copy & paste all the things
```

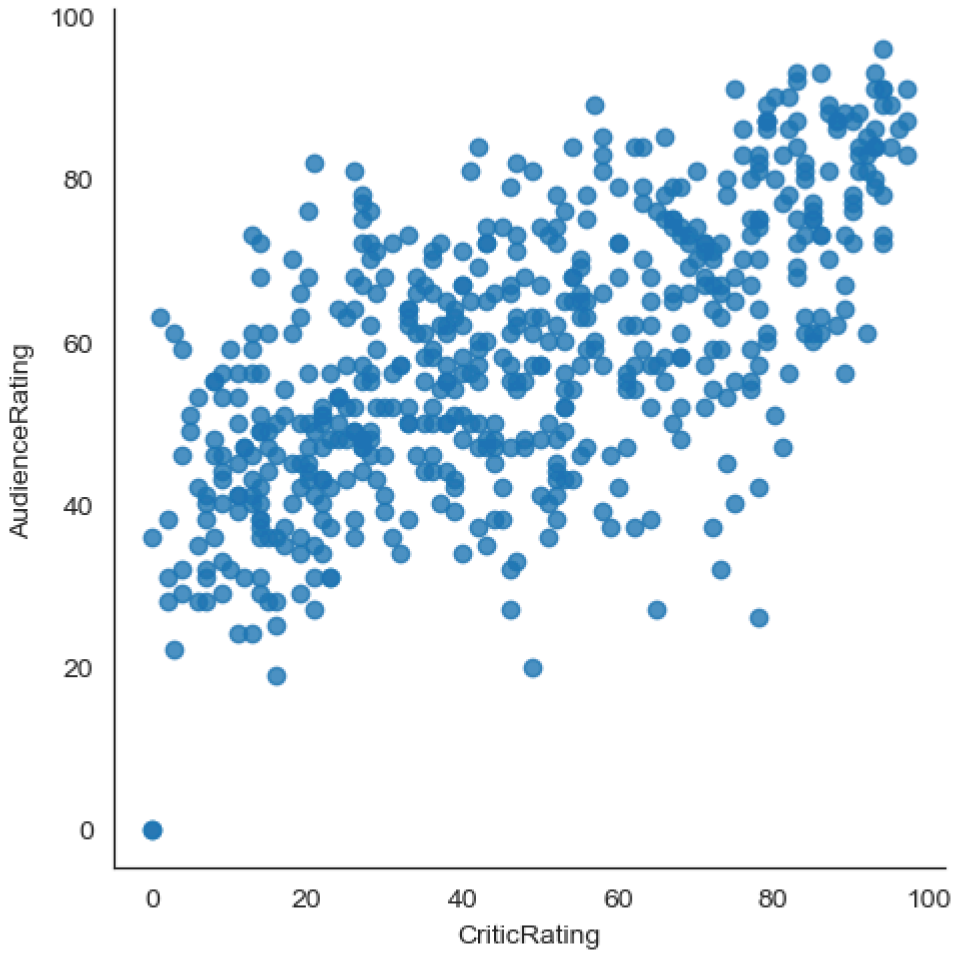
```
for gen in movies.Genre.cat.categories:
    print(gen)
```

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

In [111…

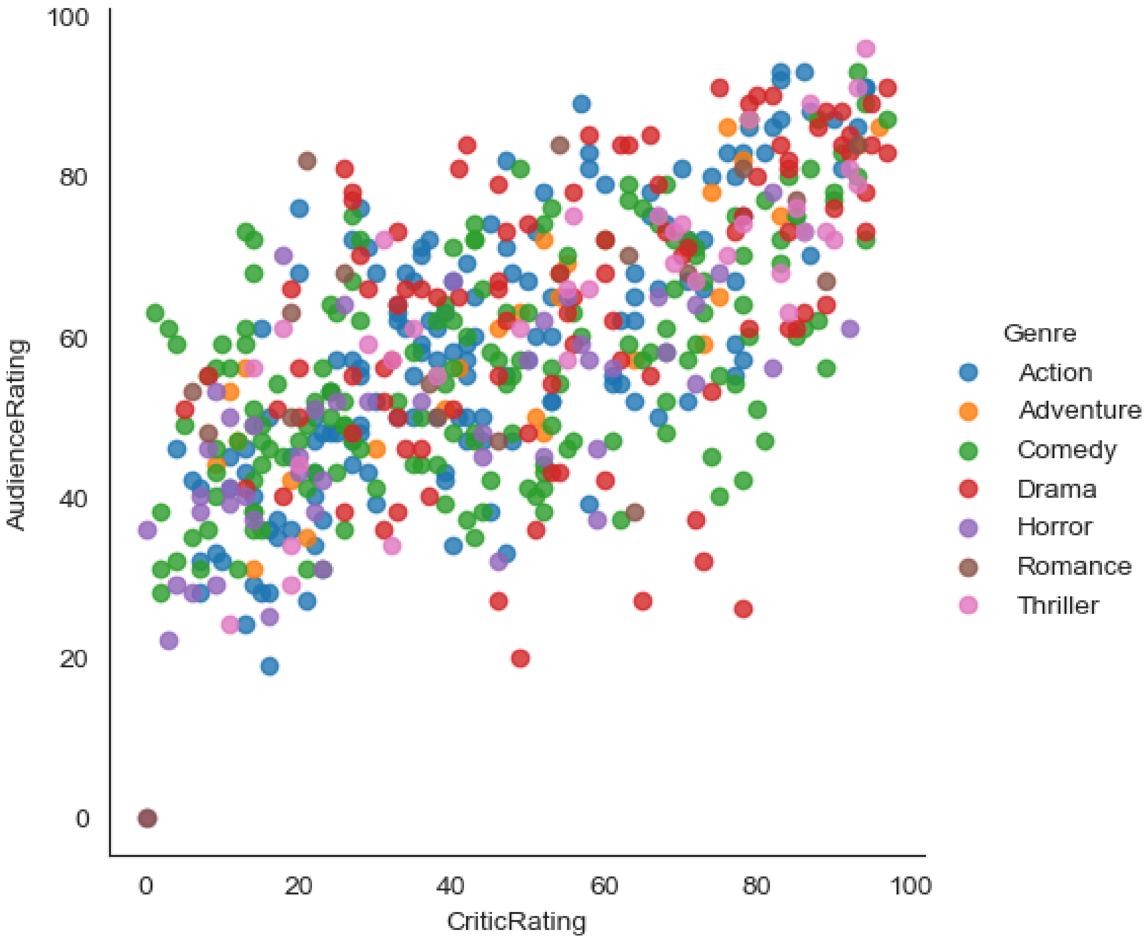
```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False)
plt.show()
```





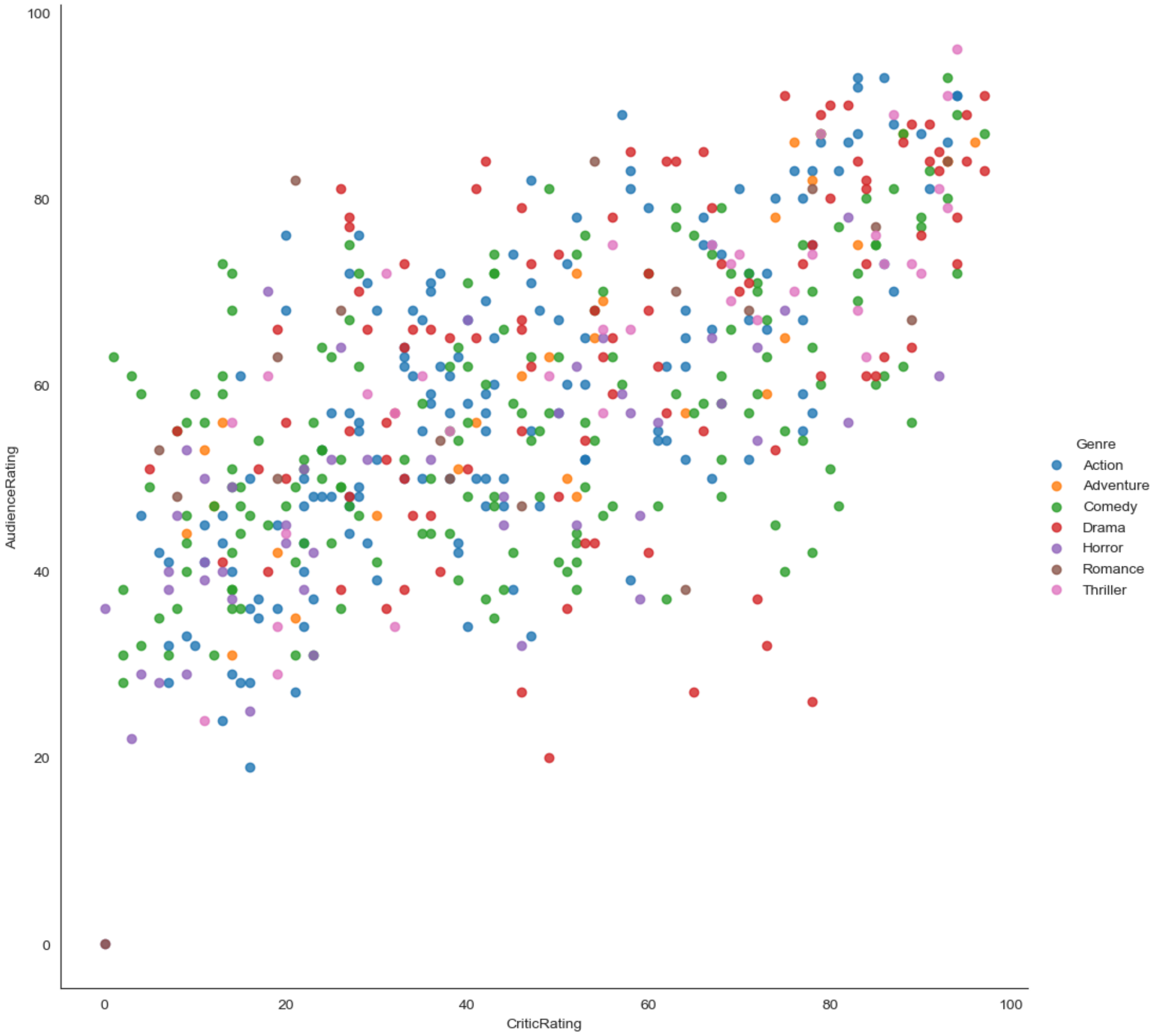
In [113…

```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False, hue = 'Genre')
plt.show()
```



In [117…

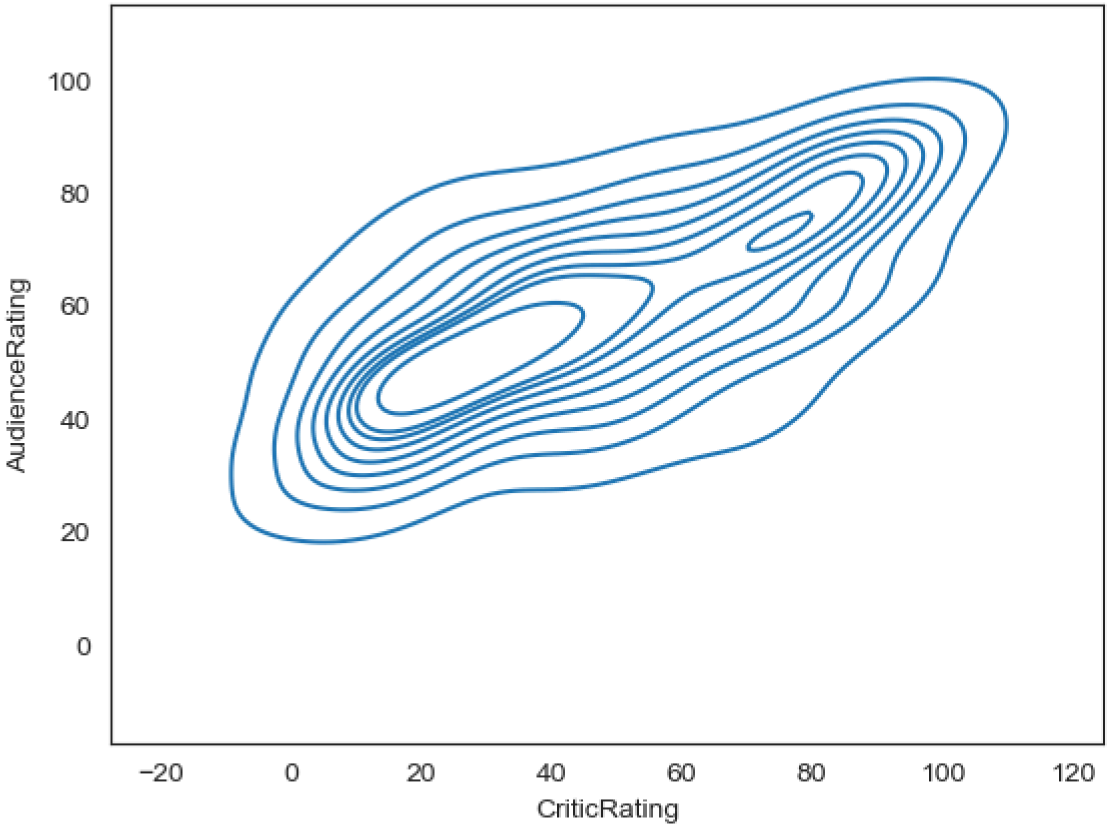
```
vis1 = sns.lmplot(data=movies, x='CriticRating', y='AudienceRating',\
                  fit_reg=False, hue = 'Genre', height = 10,aspect=1)
plt.show()
```



Kernal Density Estimate plot (KDE PLOT)

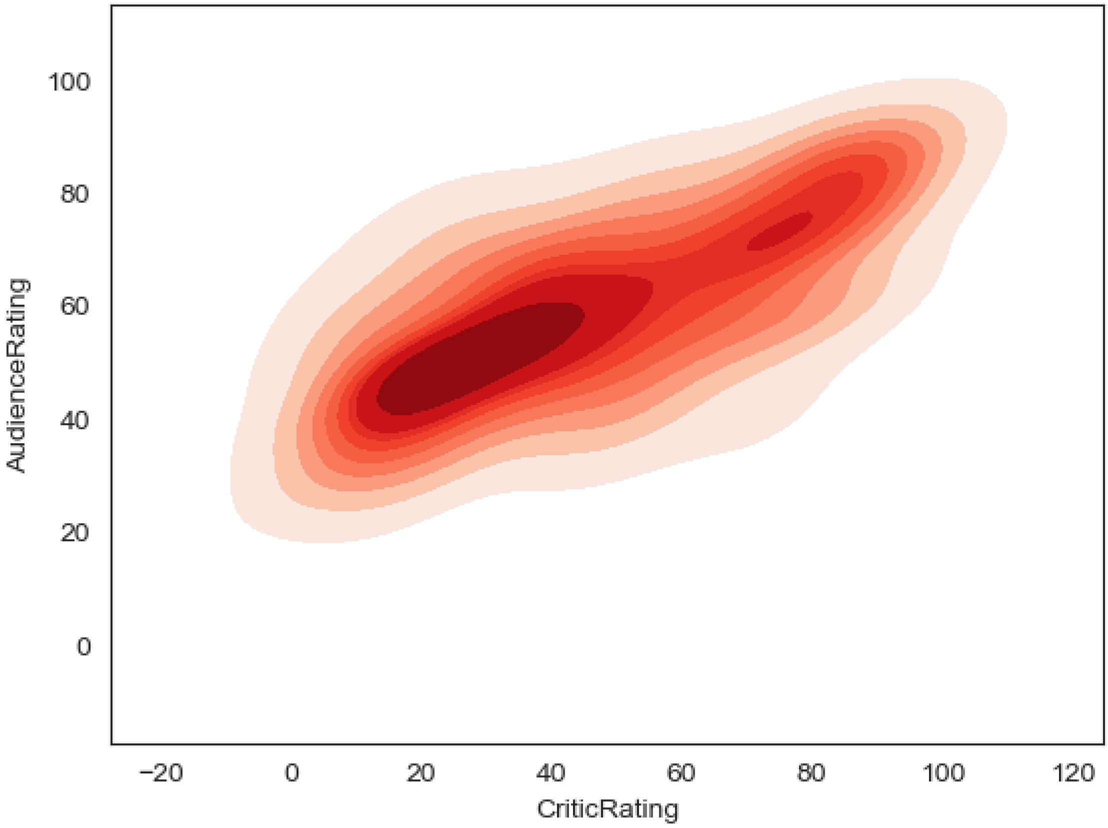
In [124…

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



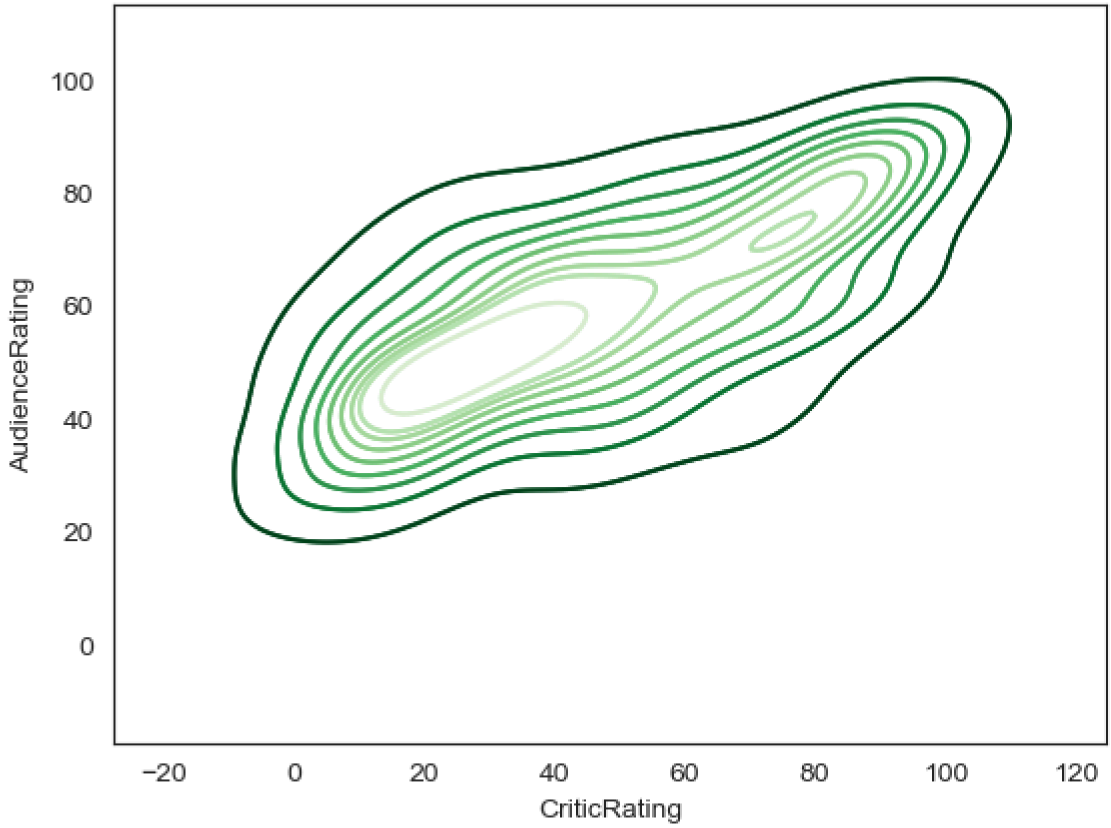
In [128…

```
k1 = sns.kdeplot(x=movies.CriticRating,y=movies.AudienceRating,shade = True,shad
plt.show()
```

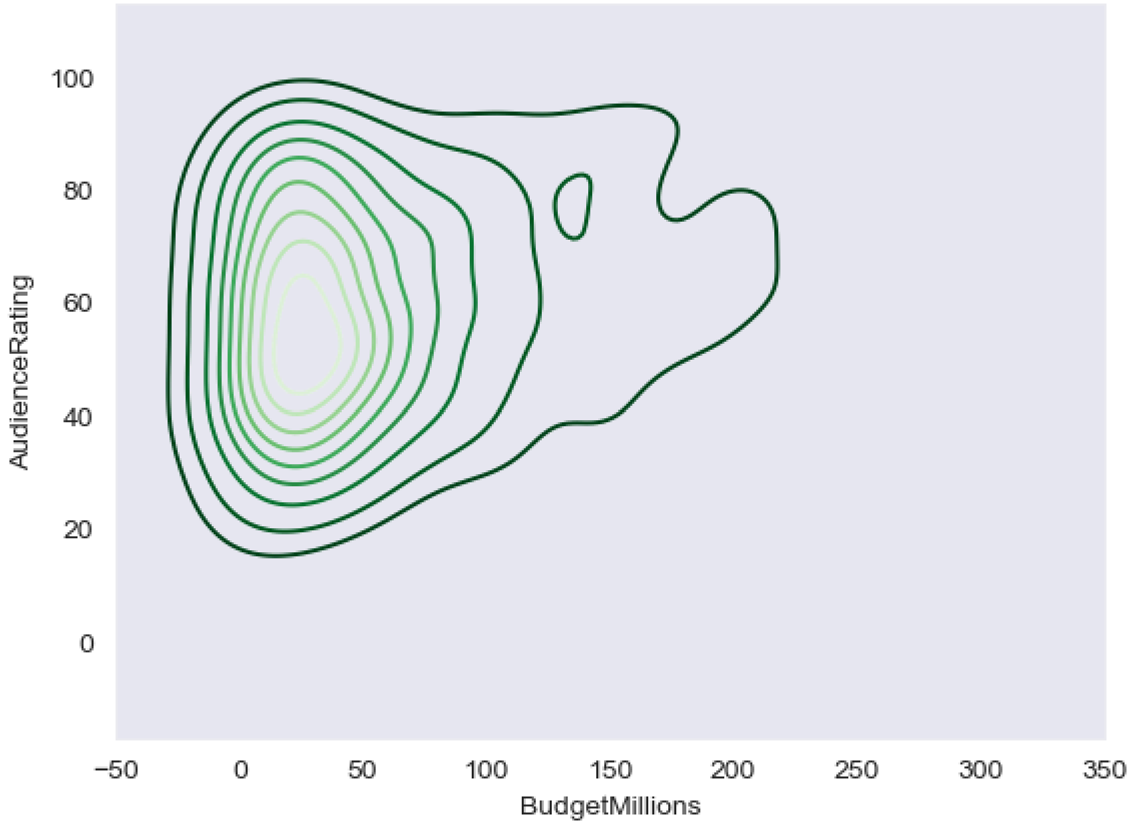


In [132…

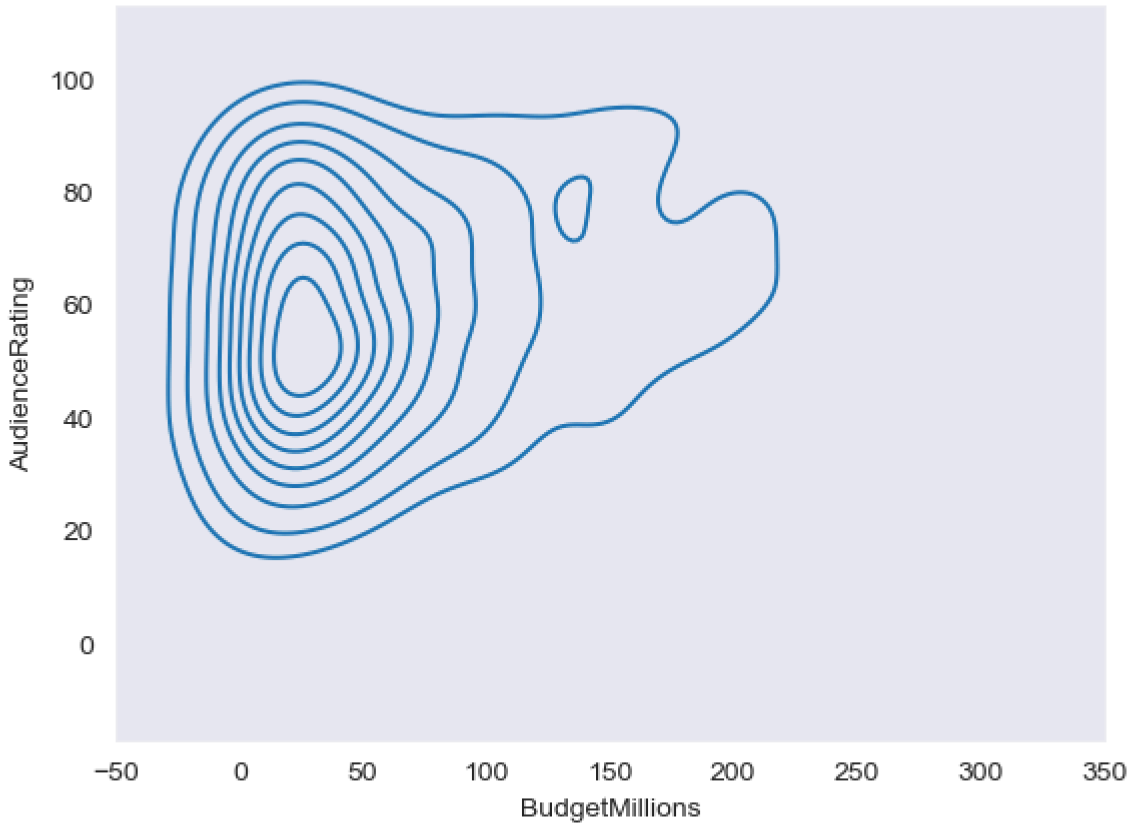
```
k2 = sns.kdeplot(x=movies.CriticRating,y=movies.AudienceRating,shade_lowest=Fals
plt.show()
```



In [134…
```
sns.set_style('dark')
k1 = sns.kdeplot(x=movies.BudgetMillions,y=movies.AudienceRating,shade_lowest=Fa
plt.show()
```

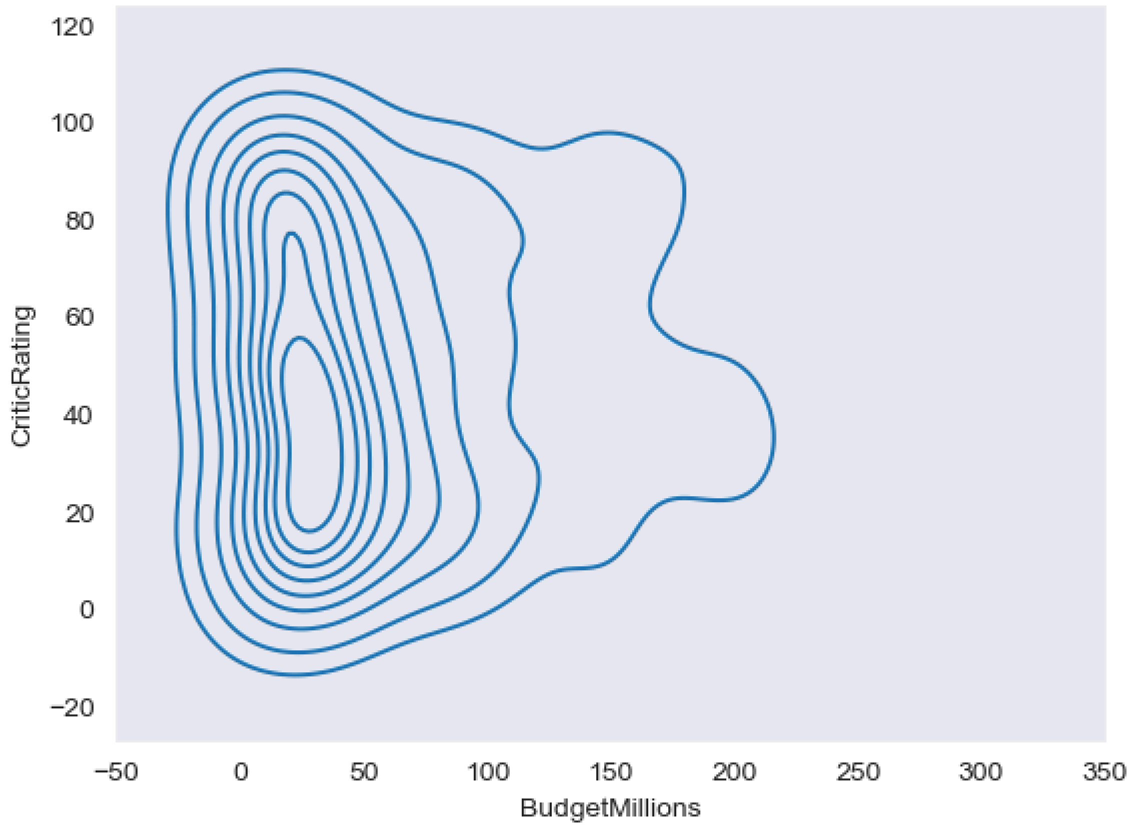


In [136…
```
sns.set_style('dark')
k1 = sns.kdeplot(x=movies.BudgetMillions,y=movies.AudienceRating)
plt.show()
```



In [140…

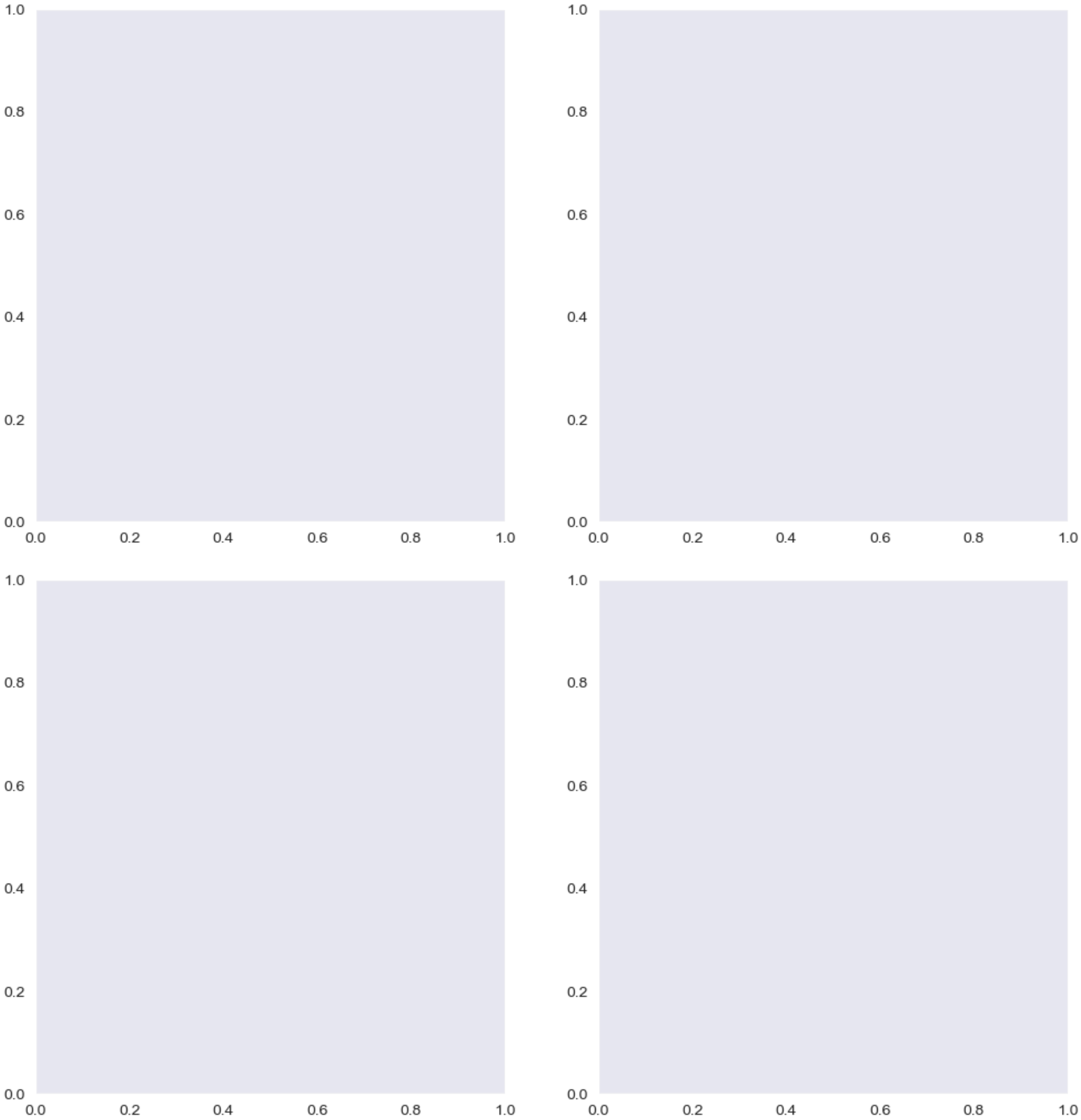
```
k2 = sns.kdeplot(x=movies.BudgetMillions,y=movies.CriticRating)
plt.show()
```



In [144…

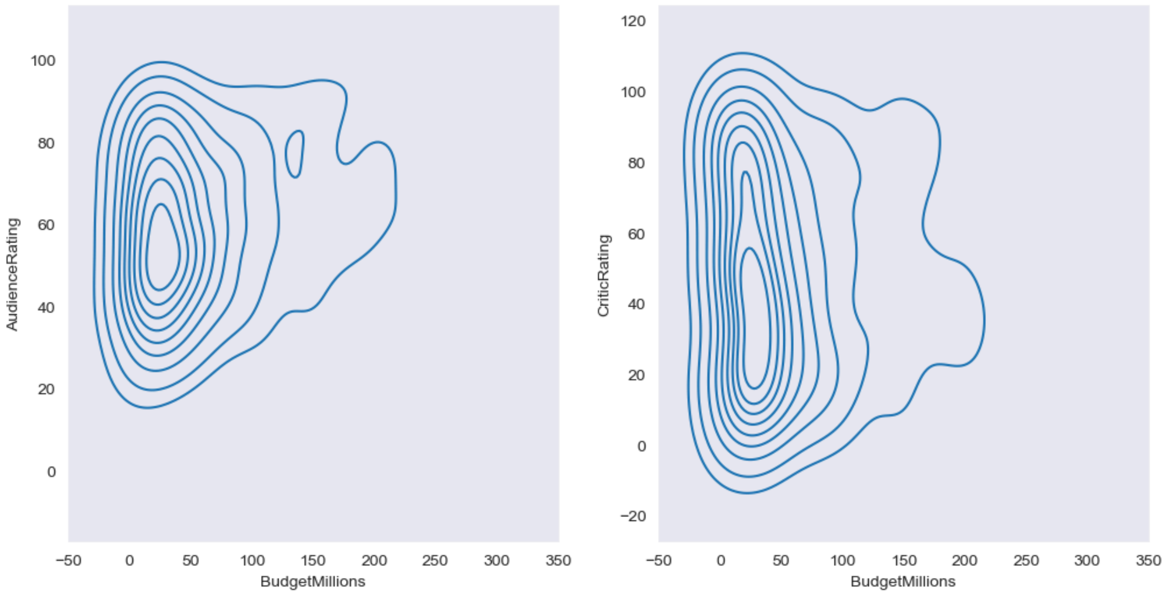
```
#subplots

f, ax = plt.subplots(1,2, figsize =(12,6))
```

```
plt.show()
#f, ax = plt.subplots(3,3, figsize =(12,6))
```



In [146…

```
f, axes = plt.subplots(1,2, figsize =(12,6))

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



In [148…

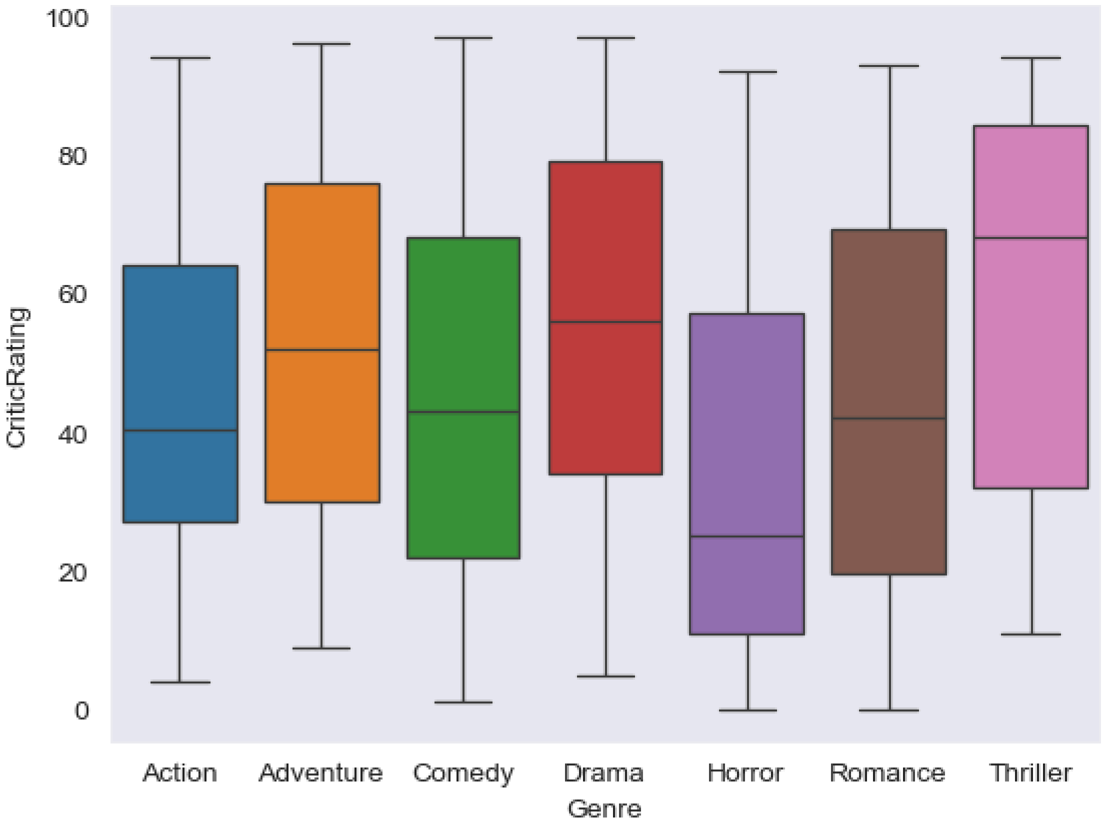
```
axes
```

Out[148…

```
array([<Axes: xlabel='BudgetMillions', ylabel='AudienceRating'>,
       <Axes: xlabel='BudgetMillions', ylabel='CriticRating'>],
      dtype=object)
```

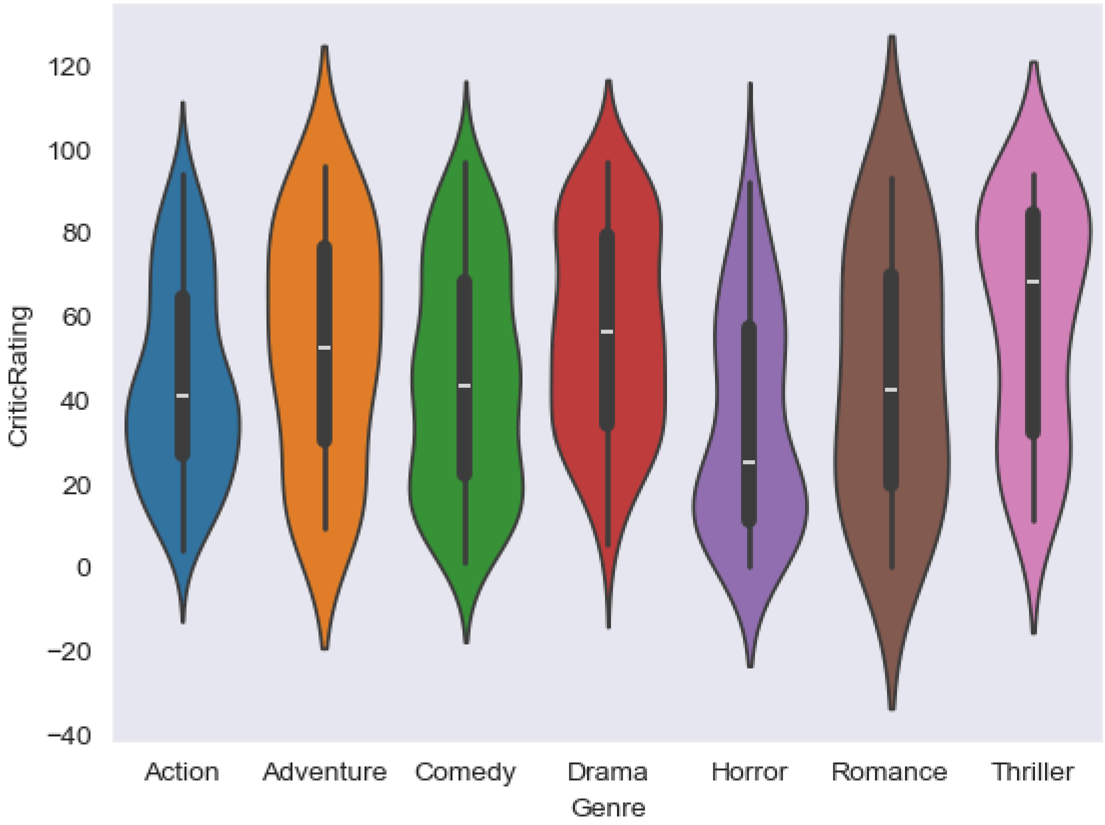
In [164…

```
#Box plots -

w = sns.boxplot(data=movies, x='Genre', y = 'CriticRating', hue="Genre")
plt.show()
```



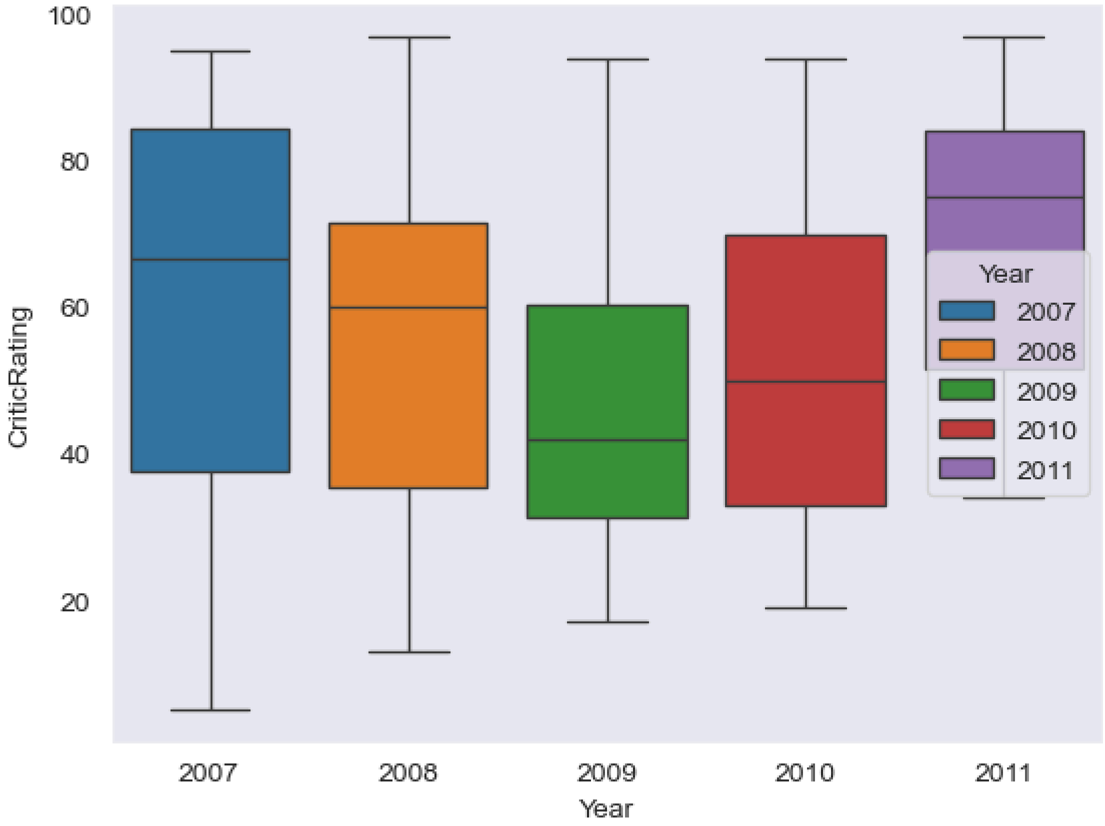
In [168…

```
#violin plot

z = sns.violinplot(data=movies, x='Genre', y = 'CriticRating', hue="Genre")
plt.show()
```



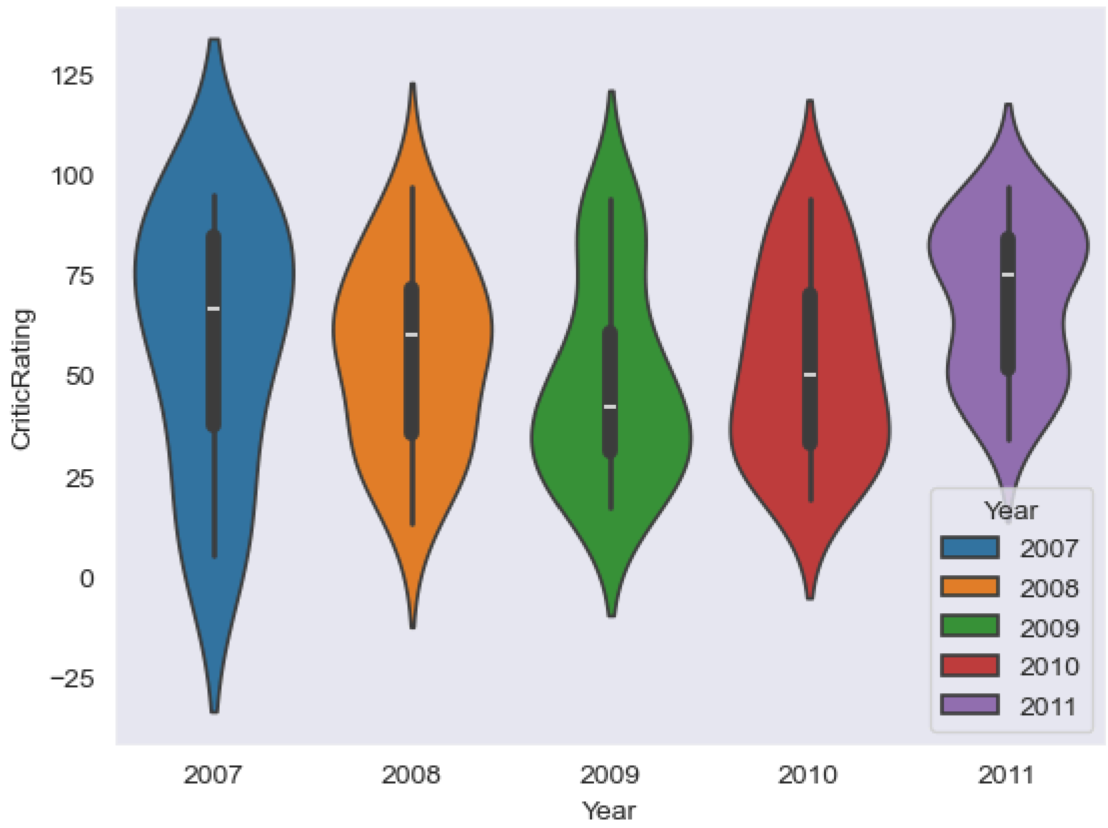
In [176…

```
w1 = sns.boxplot(data=movies[movies.Genre == 'Drama'], x='Year', y = 'CriticRati
plt.show()
```



In [178…

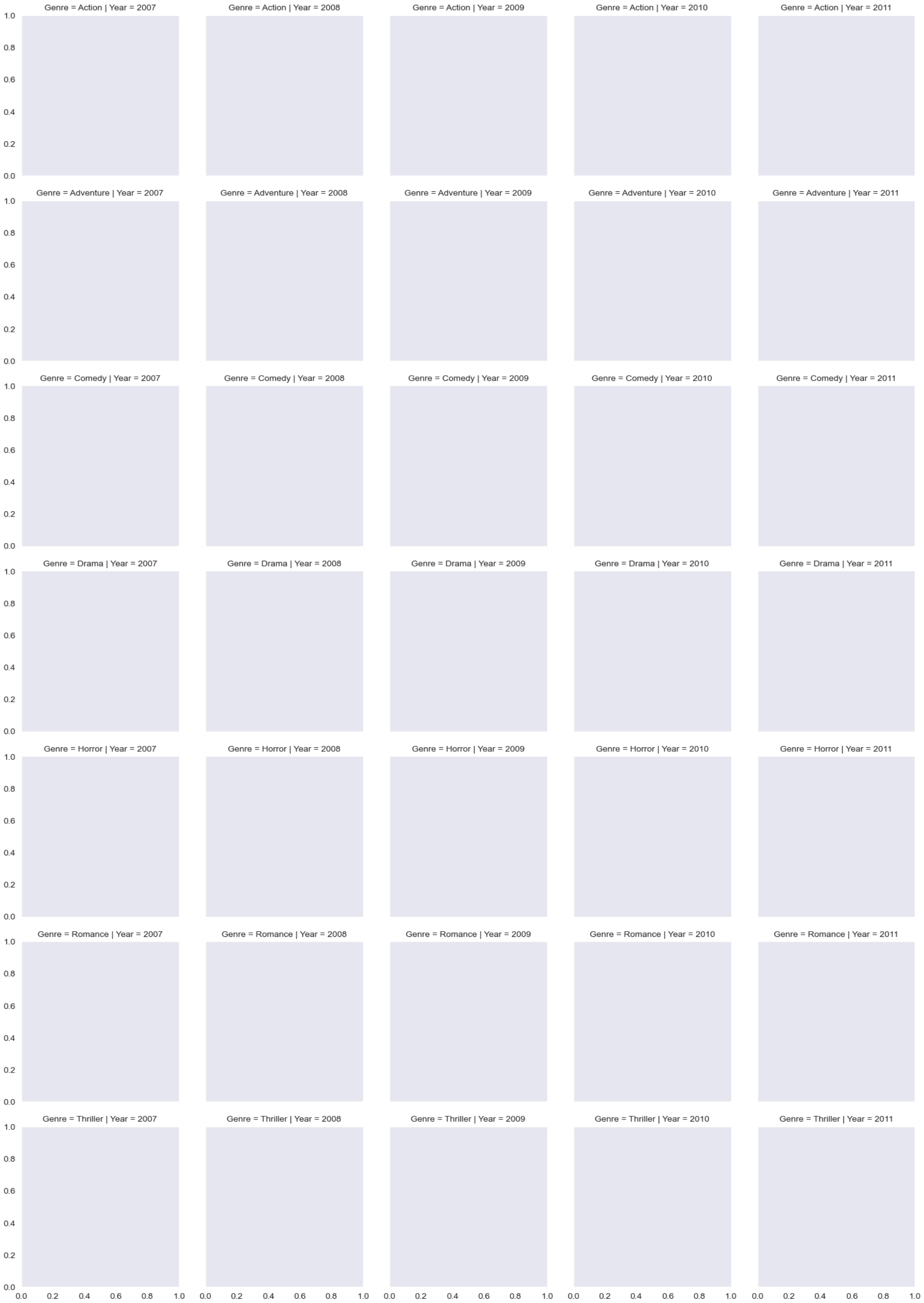
```
z = sns.violinplot(data=movies[movies.Genre == 'Drama'], x='Year', y = 'CriticRa
plt.show()
```

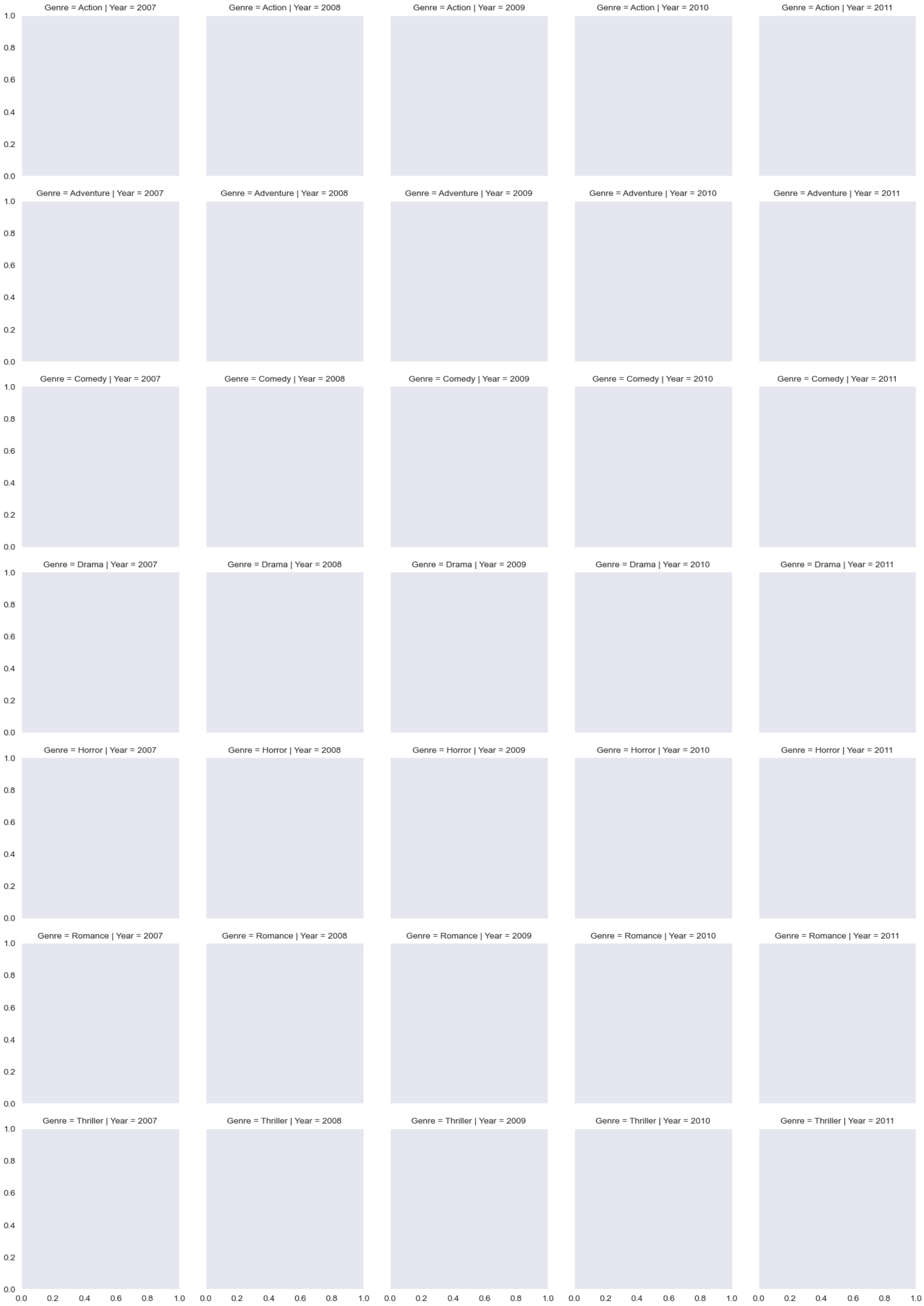


Creating a Facet grid

In [184…

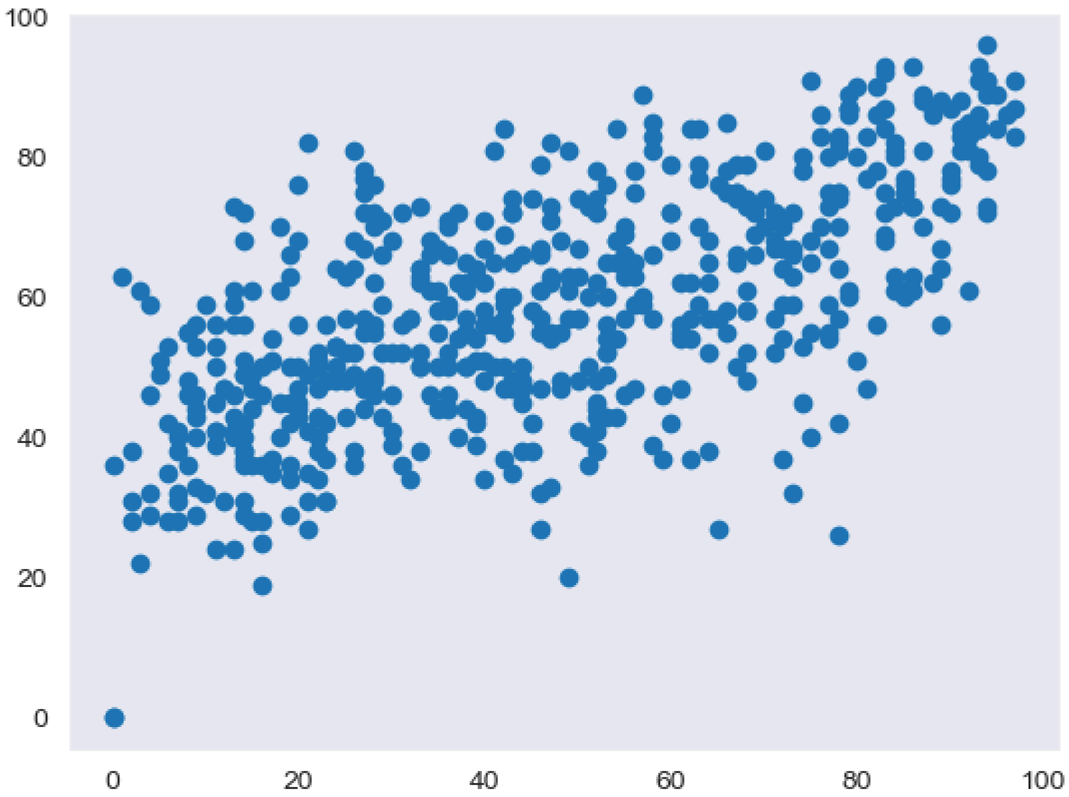
```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre') #kind of s
plt.show()
```


Genre = Action | Year = 2007
Genre = Action | Year = 2008
Genre = Action | Year = 2009
Genre = Action | Year = 2010
Genre = Action | Year = 2011
Genre = Adventure | Year = 2007
Genre = Adventure | Year = 2008
Genre = Adventure | Year = 2009
Genre = Adventure | Year = 2010
Genre = Adventure | Year = 2011
Genre = Comedy | Year = 2007
Genre = Comedy | Year = 2008
Genre = Comedy | Year = 2009
Genre = Comedy | Year = 2010
Genre = Comedy | Year = 2011
Genre = Drama | Year = 2007
Genre = Drama | Year = 2008
Genre = Drama | Year = 2009
Genre = Drama | Year = 2010
Genre = Drama | Year = 2011
Genre = Horror | Year = 2007
Genre = Horror | Year = 2008
Genre = Horror | Year = 2009
Genre = Horror | Year = 2010
Genre = Horror | Year = 2011
Genre = Romance | Year = 2007
Genre = Romance | Year = 2008
Genre = Romance | Year = 2009
Genre = Romance | Year = 2010
Genre = Romance | Year = 2011
Genre = Thriller | Year = 2007
Genre = Thriller | Year = 2008
Genre = Thriller | Year = 2009
Genre = Thriller | Year = 2010
Genre = Thriller | Year = 2011
1.0
0.8
0.6
0.4
0.2
0.0
0.0
0.2
0.4
0.6
0.8
1.0



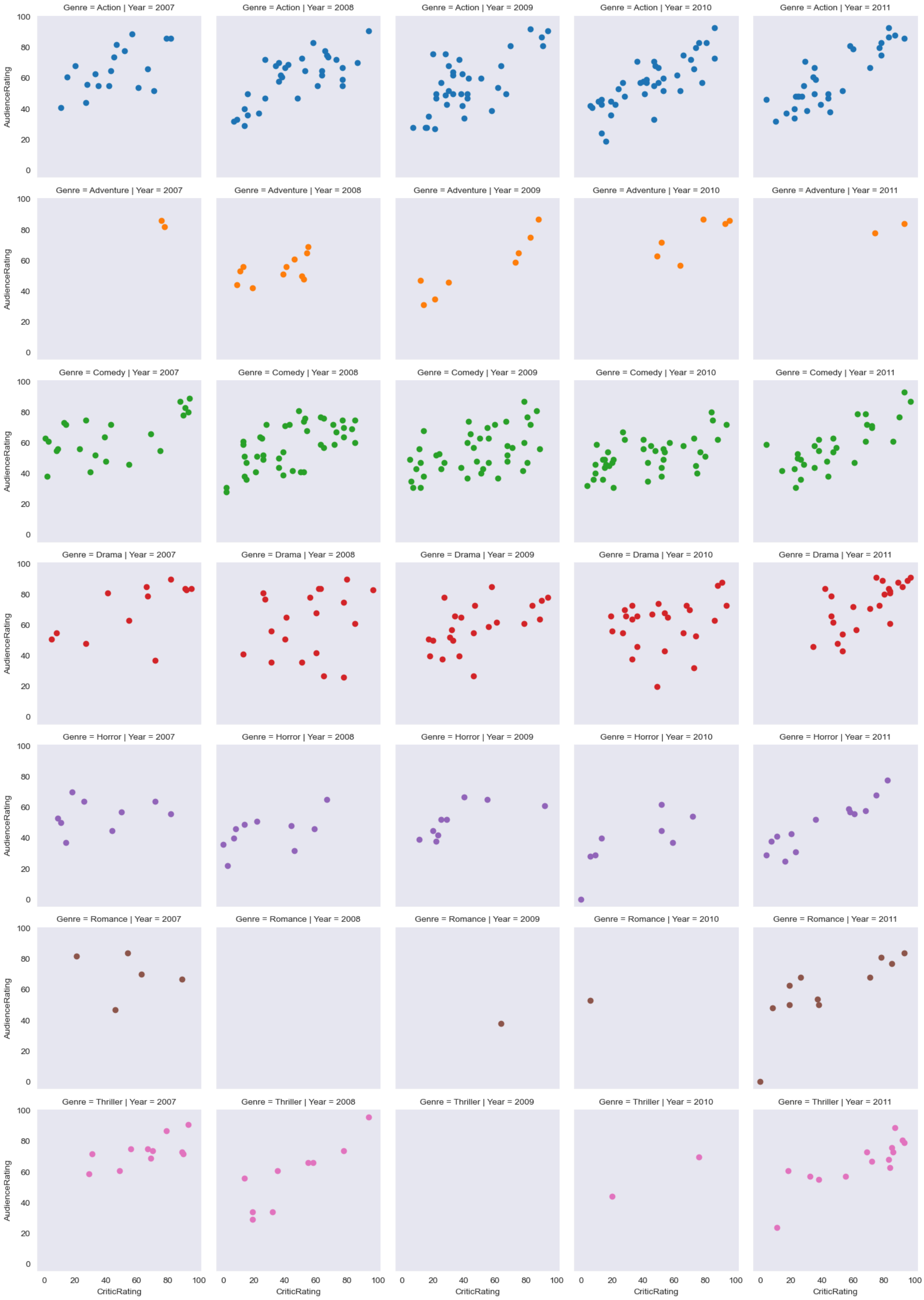
In [186…

```
plt.scatter(movies.CriticRating,movies.AudienceRating)
plt.show()
```



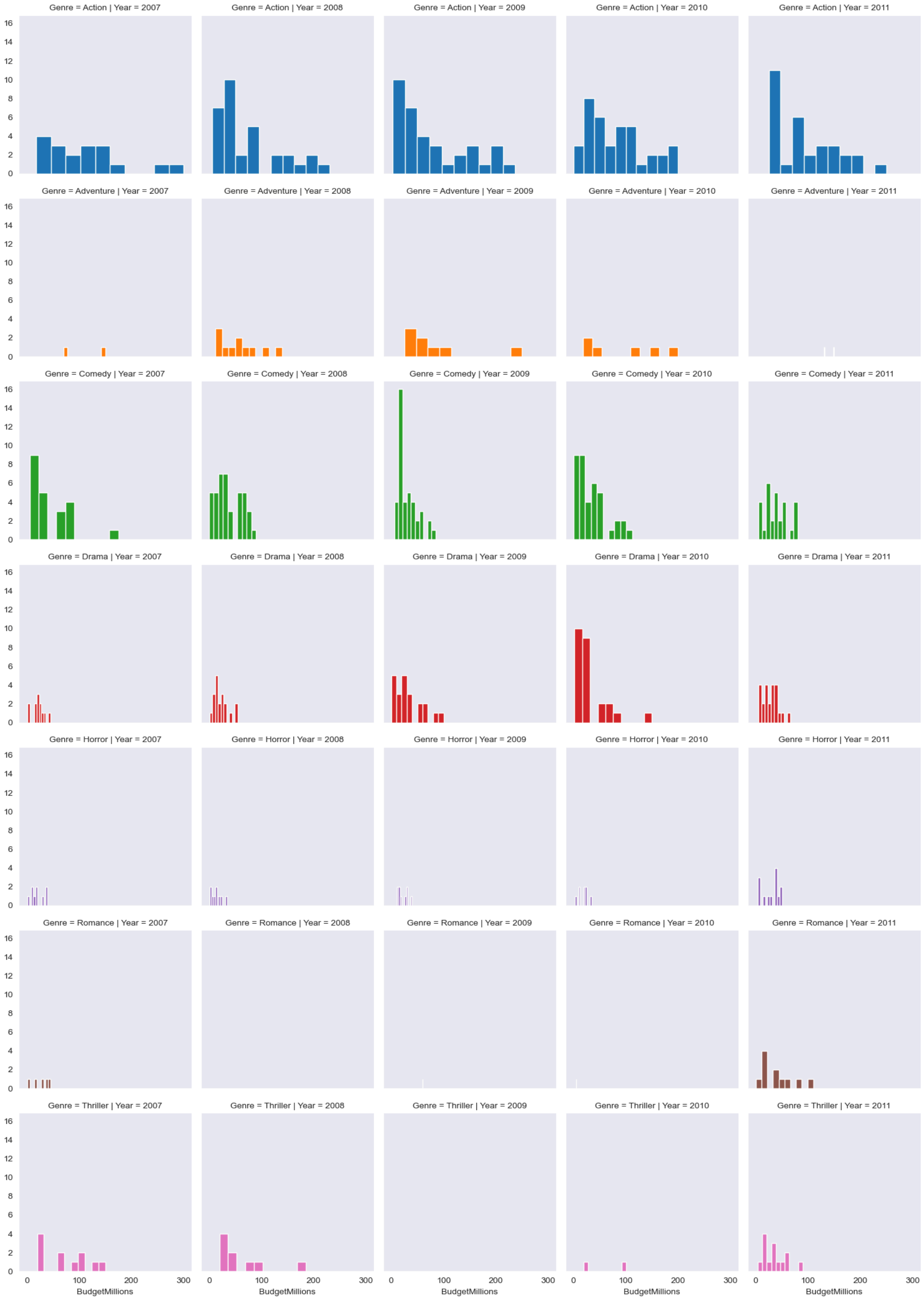
In [188…

```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre')
g = g.map(plt.scatter, 'CriticRating', 'AudienceRating' ) #scatterplots are mapp
plt.show()
```



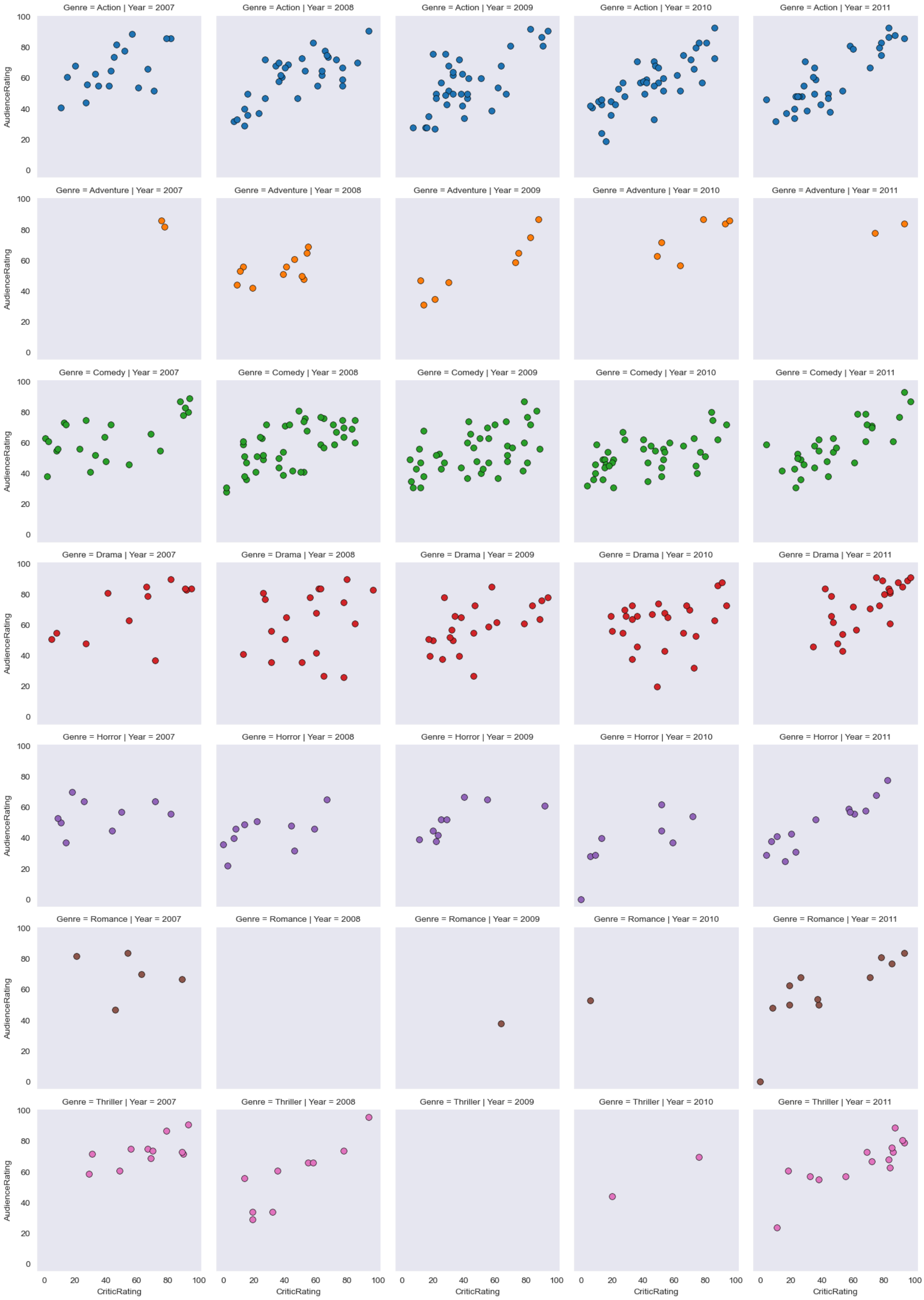
In [190…

```
# you can populated any type of chat.

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



In [192…

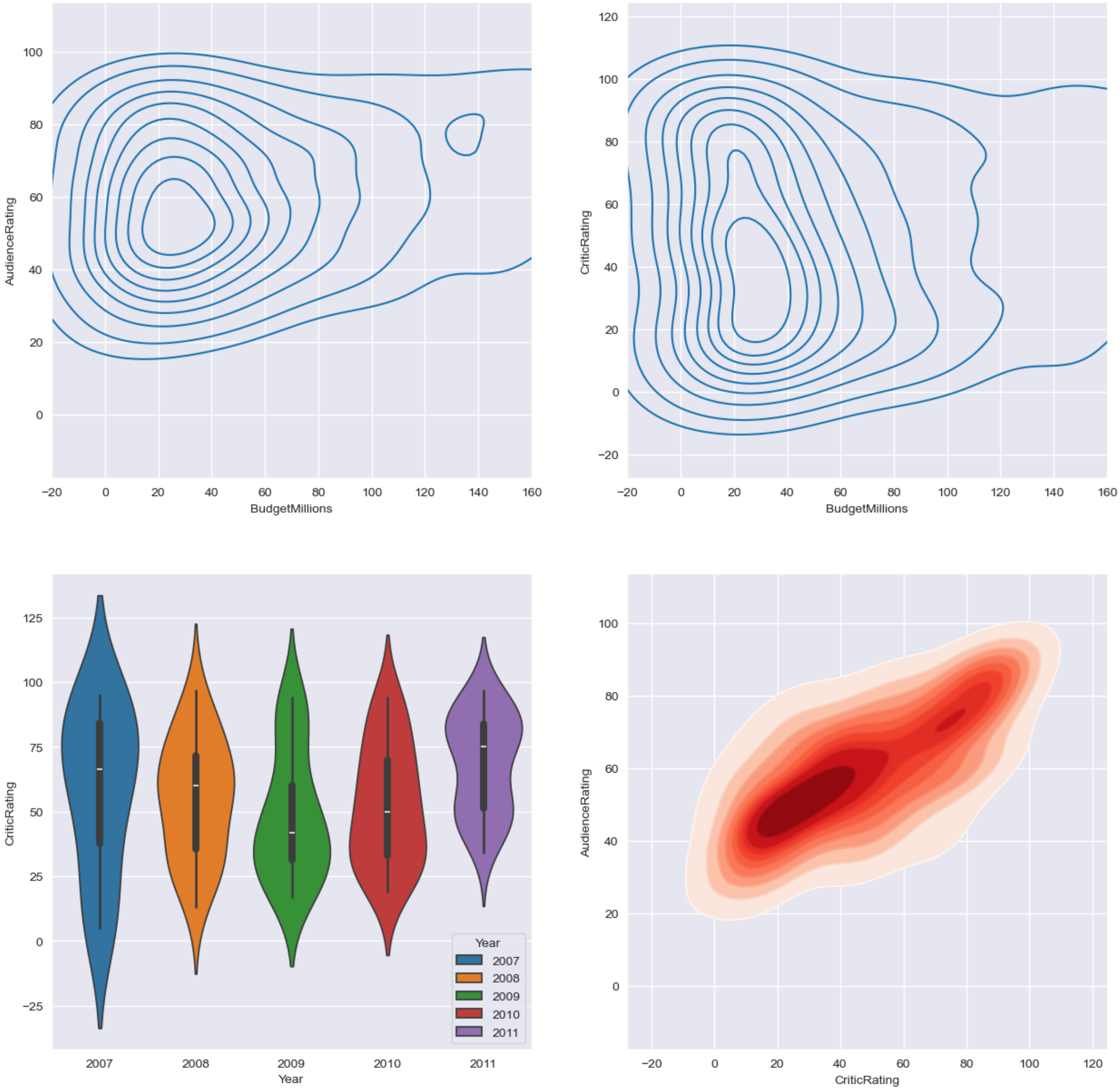
```
g =sns.FacetGrid (movies, row = 'Genre', col = 'Year', hue = 'Genre')
kws = dict(s=50, linewidth=0.5,edgecolor='black')
g = g.map(plt.scatter, 'CriticRating', 'AudienceRating',**kws ) #scatterplots ar
plt.show()
```



In [200…

```
# python is not vectorize programming language
# Building dashboards (dashboard - combination of chats)

sns.set_style('darkgrid')
f, axes = plt.subplots (2,2, figsize = (15,15))

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

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

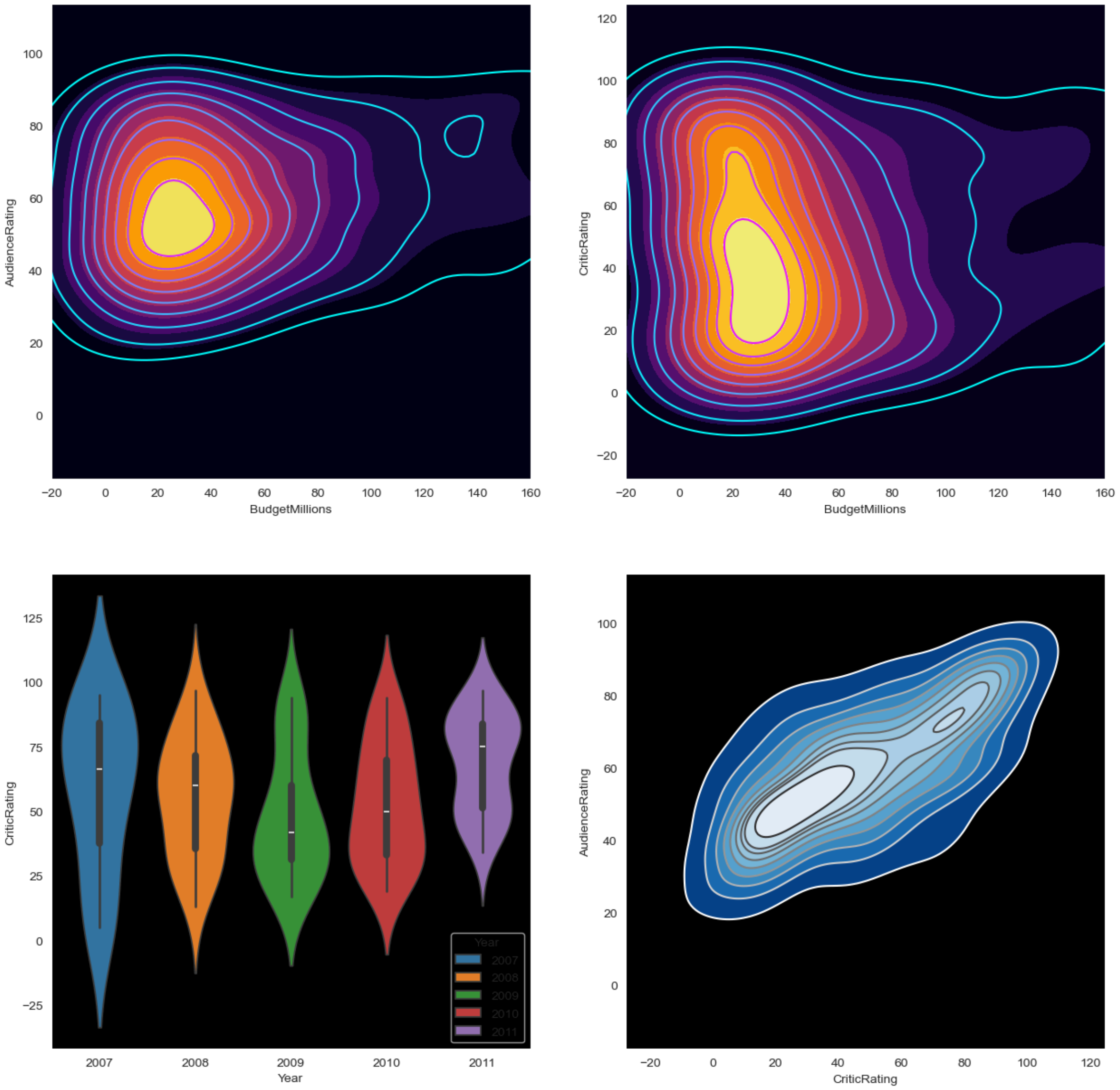
```
k2.set(xlim=(-20,160))

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

k4 = sns.kdeplot(x=movies.CriticRating,y=movies.AudienceRating,shade = True,shad

k4b = sns.kdeplot(x=movies.CriticRating,y= movies.AudienceRating,cmap='Reds',ax

plt.show()
```



In [208…

```
# How can you style your dashboard  using different color map

# python is not vectorize programming language
# Building dashboards (dashboard - combination of chats)

sns.set_style('dark',{'axes.facecolor':'black'})
f, axes = plt.subplots (2,2, figsize = (15,15))

#plot [0,0]
k1 = sns.kdeplot(x=movies.BudgetMillions,y=movies.AudienceRating, \
                 shade = True, shade_lowest=True,cmap = 'inferno', \
                 ax = axes[0,0])
k1b = sns.kdeplot(x=movies.BudgetMillions,y=movies.AudienceRating, \
                 cmap = 'cool',ax = axes[0,0])
```

```
#plot [0,1]
k2 = sns.kdeplot(x=movies.BudgetMillions,y=movies.CriticRating,\
                 shade=True, shade_lowest=True, cmap='inferno',\
                 ax = axes[0,1])
k2b = sns.kdeplot(x=movies.BudgetMillions,y=movies.CriticRating,\
                  cmap = 'cool', ax = axes[0,1])

#plot[1,0]
z = sns.violinplot(data=movies[movies.Genre=='Drama'], \
                   x='Year', y = 'CriticRating', hue='Year', ax=axes[1,0])

#plot[1,1]
k4 = sns.kdeplot(x=movies.CriticRating,y=movies.AudienceRating, \
                 shade = True,shade_lowest=False,cmap='Blues_r', \
                 ax=axes[1,1])

k4b = sns.kdeplot(x=movies.CriticRating, y=movies.AudienceRating, \
                  cmap='gist_gray_r',ax = axes[1,1])


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

plt.show()
```



In [ ]:

```
```