In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

# Read the data

In [2]:
```
data=pd.read_excel("D:/Data Analytics/EDA/Video Games.xlsx")
```

# View the data

In [3]:
```
data
```

Out[3]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Ot |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

96 rows × 11 columns

# To check the rows and columns

In [4]:
```
data.shape
```

Out[4]:
```
(96, 11)
```

# To print top 5 records

In [5]:
```
data.head(5)
```

Out[5]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |

# To print bottom 5 records

In [6]:
```
data.tail(5)
```

Out[6]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

# To print columns names

In [7]:
```
data.columns
```

Out[7]:
```
Index(['Rank', 'Name', 'Platform', 'Year', 'Genre', 'Publisher', 'NA_Sales',
       'EU_Sales', 'JP_Sales', 'Other_Sales', 'Global_Sales'],
      dtype='object')
```

# To check the datatype

In [8]:
```
data.dtypes
```

Out[8]:
```
Rank              int64
Name             object
Platform         object
Year              int64
Genre            object
Publisher        object
NA_Sales        float64
EU_Sales        float64
JP_Sales        float64
Other_Sales     float64
Global_Sales    float64
dtype: object
```

# To check null values

In [9]:
```
data.isnull()
```

Out[9]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | False | False | False | False | False | False | False | False | False | False |
| **1** | False | False | False | False | False | False | False | False | False | False |
| **2** | False | False | False | False | False | False | False | False | False | False |
| **3** | False | False | False | False | False | False | False | False | False | False |
| **4** | False | False | False | False | False | False | False | False | False | False |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **91** | False | False | False | False | False | False | False | False | False | False |
| **92** | False | False | False | False | False | False | False | False | False | False |
| **93** | False | False | False | False | False | False | False | False | False | False |
| **94** | False | False | False | False | False | False | False | False | False | False |
| **95** | False | False | False | False | False | False | False | False | False | False |

96 rows × 11 columns

# Sum of null values

In [10]:
```
data.isnull().sum()
```

Out[10]:
```
Rank            0
Name            0
Platform        0
Year            0
Genre           0
Publisher       0
NA_Sales        0
EU_Sales        0
JP_Sales        0
Other_Sales     0
Global_Sales    0
dtype: int64
```

# To print the dimensions

In [11]:
```
data.ndim
```

Out[11]:
```
2
```

# To print the index

In [12]:
```
data.index
```

Out[12]:
```
RangeIndex(start=0, stop=96, step=1)
```

# Set index as Rank

In [13]:
```
data.set_index('Rank')
```

Out[13]:

| Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |
| ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

96 rows × 10 columns

# To check the size of data

In [14]:
```
data.size
```

Out[14]:
```
1056
```

# To check the data is empty or not

In [15]:
```
data.empty
```

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

# To print the information

In [16]:
```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 96 entries, 0 to 95
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype  
---  ------        --------------  -----  
 0   Rank          96 non-null     int64  
 1   Name          96 non-null     object 
 2   Platform      96 non-null     object 
 3   Year          96 non-null     int64  
 4   Genre         96 non-null     object 
 5   Publisher     96 non-null     object 
 6   NA_Sales      96 non-null     float64
 7   EU_Sales      96 non-null     float64
 8   JP_Sales      96 non-null     float64
 9   Other_Sales   96 non-null     float64
 10  Global_Sales  96 non-null     float64
dtypes: float64(5), int64(2), object(4)
memory usage: 8.4+ KB
```

# To print Statistical information

In [17]:
```
data.describe()
```

Out[17]:

| | Rank | Year | NA_Sales | EU_Sales | JP_Sales | Other_Sales | Global_Sales |
|---|---|---|---|---|---|---|---|
| **count** | 96.000000 | 96.000000 | 96.000000 | 96.000000 | 96.000000 | 96.000000 | 96.000000 |
| **mean** | 48.500000 | 2005.052083 | 7.157396 | 4.313542 | 2.098333 | 1.351771 | 14.920417 |
| **std** | 27.856777 | 7.728784 | 5.969033 | 3.543298 | 2.065092 | 1.581723 | 10.029910 |
| **min** | 1.000000 | 1982.000000 | 0.980000 | 0.010000 | 0.000000 | 0.080000 | 7.580000 |
| **25%** | 24.750000 | 2001.000000 | 3.862500 | 2.410000 | 0.240000 | 0.572500 | 9.275000 |
| **50%** | 48.500000 | 2007.000000 | 5.820000 | 3.430000 | 1.780000 | 0.895000 | 11.590000 |
| **75%** | 72.250000 | 2011.000000 | 8.437500 | 5.060000 | 3.345000 | 1.622500 | 16.207500 |
| **max** | 96.000000 | 2015.000000 | 41.490000 | 29.020000 | 10.220000 | 10.570000 | 82.740000 |

In [18]:
```
data.describe(include="all")
```

Out[18]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **count** | 96.000000 | 96 | 96 | 96.000000 | 96 | 96 | 96.000000 | 96.000000 | 96.0000 |
| **unique** | NaN | 87 | 17 | NaN | 11 | 11 | NaN | NaN | Na |
| **top** | NaN | Grand Theft Auto V | Wii | NaN | Shooter | Nintendo | NaN | NaN | Na |
| **freq** | NaN | 3 | 15 | NaN | 20 | 50 | NaN | NaN | Na |
| **mean** | 48.500000 | NaN | NaN | 2005.052083 | NaN | NaN | 7.157396 | 4.313542 | 2.0983 |
| **std** | 27.856777 | NaN | NaN | 7.728784 | NaN | NaN | 5.969033 | 3.543298 | 2.0650 |
| **min** | 1.000000 | NaN | NaN | 1982.000000 | NaN | NaN | 0.980000 | 0.010000 | 0.0000 |
| **25%** | 24.750000 | NaN | NaN | 2001.000000 | NaN | NaN | 3.862500 | 2.410000 | 0.2400 |
| **50%** | 48.500000 | NaN | NaN | 2007.000000 | NaN | NaN | 5.820000 | 3.430000 | 1.7800 |
| **75%** | 72.250000 | NaN | NaN | 2011.000000 | NaN | NaN | 8.437500 | 5.060000 | 3.3450 |
| **max** | 96.000000 | NaN | NaN | 2015.000000 | NaN | NaN | 41.490000 | 29.020000 | 10.2200 |

# check correlation()

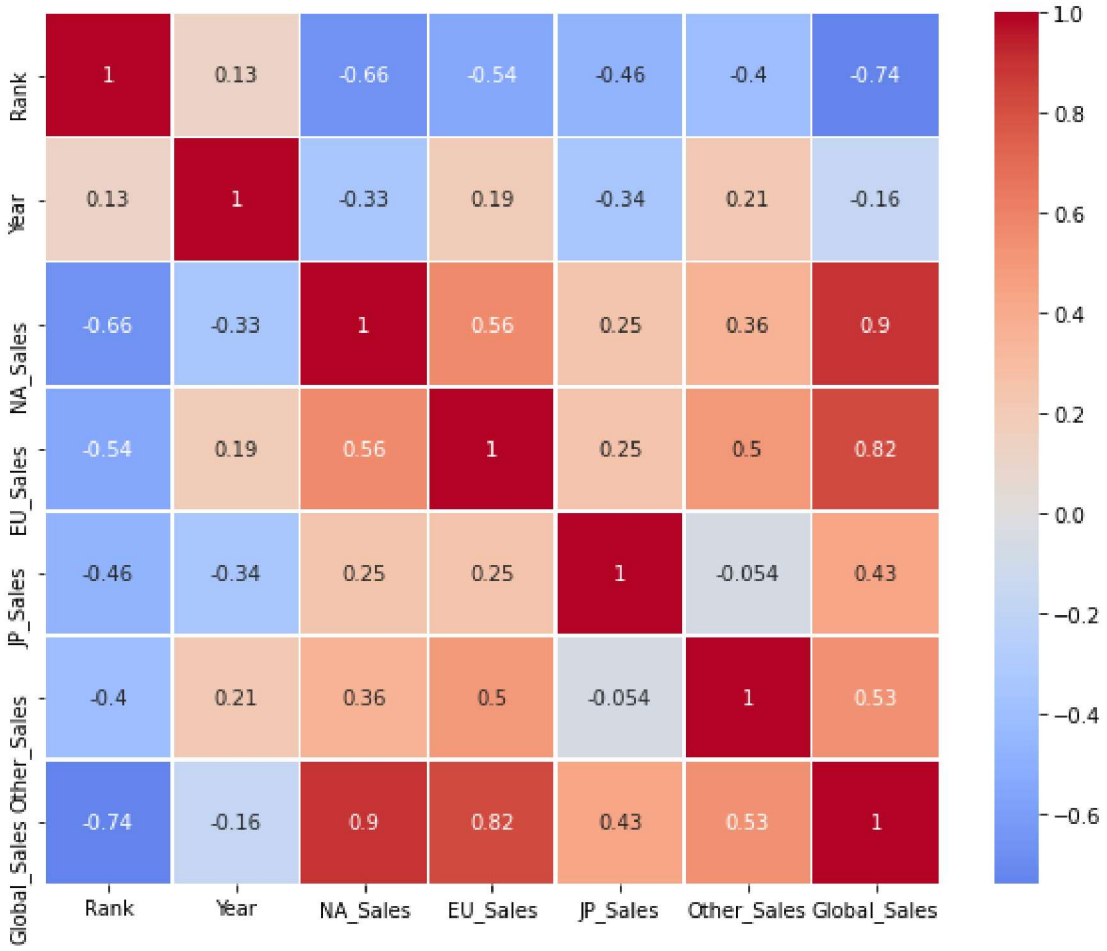
In [19]:
```
data.corr()
```

Out[19]:

| | Rank | Year | NA_Sales | EU_Sales | JP_Sales | Other_Sales | Global_Sales |
|---|---|---|---|---|---|---|---|
| **Rank** | 1.000000 | 0.127289 | -0.657309 | -0.537946 | -0.462587 | -0.399986 | -0.739582 |
| **Year** | 0.127289 | 1.000000 | -0.327936 | 0.192512 | -0.336856 | 0.211917 | -0.163147 |
| **NA_Sales** | -0.657309 | -0.327936 | 1.000000 | 0.564505 | 0.248103 | 0.355117 | 0.901666 |
| **EU_Sales** | -0.537946 | 0.192512 | 0.564505 | 1.000000 | 0.252680 | 0.498915 | 0.819937 |
| **JP_Sales** | -0.462587 | -0.336856 | 0.248103 | 0.252680 | 1.000000 | -0.053579 | 0.434380 |
| **Other_Sales** | -0.399986 | 0.211917 | 0.355117 | 0.498915 | -0.053579 | 1.000000 | 0.534322 |
| **Global_Sales** | -0.739582 | -0.163147 | 0.901666 | 0.819937 | 0.434380 | 0.534322 | 1.000000 |

In [20]:
```
plt.figure(figsize=(10,8))
sns.heatmap(data.corr(), annot=True,linewidth=.5,center=0,cmap='coolwarm')
```

Out[20]: <AxesSubplot:>




# To check duplicated values

In [21]:
```
data.duplicated()
```

Out[21]:
```
0     False
1     False
2     False
3     False
4     False
      ...
91    False
92    False
93    False
94    False
95    False
Length: 96, dtype: bool
```

# Sum of duplicated values

In [22]:
```
data.duplicated().sum()
```

Out[22]:
```
0
```

# No.of unique values in the dataset

In [23]:
```
data.nunique()
```

Out[23]:
```
Rank            96
Name            87
Platform        17
Year            27
Genre           11
Publisher       11
NA_Sales        91
EU_Sales        91
JP_Sales        82
Other_Sales     79
Global_Sales    92
dtype: int64
```

# Print Unique name in dataset

In [24]:
```
data.Name.unique()
```

Out[24]:
```
array(['Wii Sports', 'Super Mario Bros.', 'Mario Kart Wii',
       'Wii Sports Resort', 'Pokemon Red/Pokemon Blue', 'Tetris',
       'New Super Mario Bros.', 'Wii Play', 'New Super Mario Bros. Wii',
       'Duck Hunt', 'Nintendogs', 'Mario Kart DS',
       'Pokemon Gold/Pokemon Silver', 'Wii Fit', 'Wii Fit Plus',
       'Kinect Adventures!', 'Grand Theft Auto V',
       'Grand Theft Auto: San Andreas', 'Super Mario World', 'Brain Age',
       'Pokemon Diamond/Pokemon Pearl', 'Super Mario Land',
       'Super Mario Bros. 3', 'Grand Theft Auto: Vice City',
       'Pokemon Ruby/Pokemon Sapphire', 'Pokemon Black/Pokemon White',
       'Brain Age 2: More Training in Minutes a Day',
       'Gran Turismo 3: A-Spec', 'Call of Duty: Modern Warfare 3',
       'PokÃ©mon Yellow: Special Pikachu Edition',
       'Call of Duty: Black Ops', 'Pokemon X/Pokemon Y',
       'Call of Duty: Black Ops 3', 'Call of Duty: Black Ops II',
       'Call of Duty: Modern Warfare 2', 'Grand Theft Auto III',
       'Super Smash Bros. Brawl', 'Animal Crossing: Wild World',
       'Mario Kart 7', 'Halo 3', 'Pokemon HeartGold/Pokemon SoulSilver',
       'Super Mario 64', 'Gran Turismo 4', 'Super Mario Galaxy',
       'Pokemon Omega Ruby/Pokemon Alpha Sapphire',
       'Super Mario Land 2: 6 Golden Coins', 'Grand Theft Auto IV',
       'Gran Turismo', 'Super Mario 3D Land', 'Gran Turismo 5',
       'Super Mario All-Stars', 'Pokemon FireRed/Pokemon LeafGreen',
       'Just Dance 3', 'Call of Duty: Ghosts', 'Halo: Reach',
       'Mario Kart 64', 'New Super Mario Bros. 2', 'Halo 4',
       'Final Fantasy VII', 'Just Dance 2', 'Gran Turismo 2',
       'Call of Duty 4: Modern Warfare', 'Donkey Kong Country',
       'Minecraft', 'Animal Crossing: New Leaf', 'Mario Party DS',
       'The Elder Scrolls V: Skyrim', 'Super Mario Kart', 'FIFA 16',
       'Wii Party', 'Halo 2', 'Mario Party 8',
       'Pokemon Black 2/Pokemon White 2', 'FIFA Soccer 13', 'The Sims 3',
       'GoldenEye 007', 'Mario & Sonic at the Olympic Games',
       'Final Fantasy X', 'Final Fantasy VIII',
       'PokÃ©mon Platinum Version', 'Pac-Man',
       'Grand Theft Auto: Liberty City Stories', 'Super Mario Galaxy 2',
       'Star Wars Battlefront (2015)', 'Call of Duty: Advanced Warfare',
       'The Legend of Zelda: Ocarina of Time',
       'Crash Bandicoot 2: Cortex Strikes Back'], dtype=object)
```

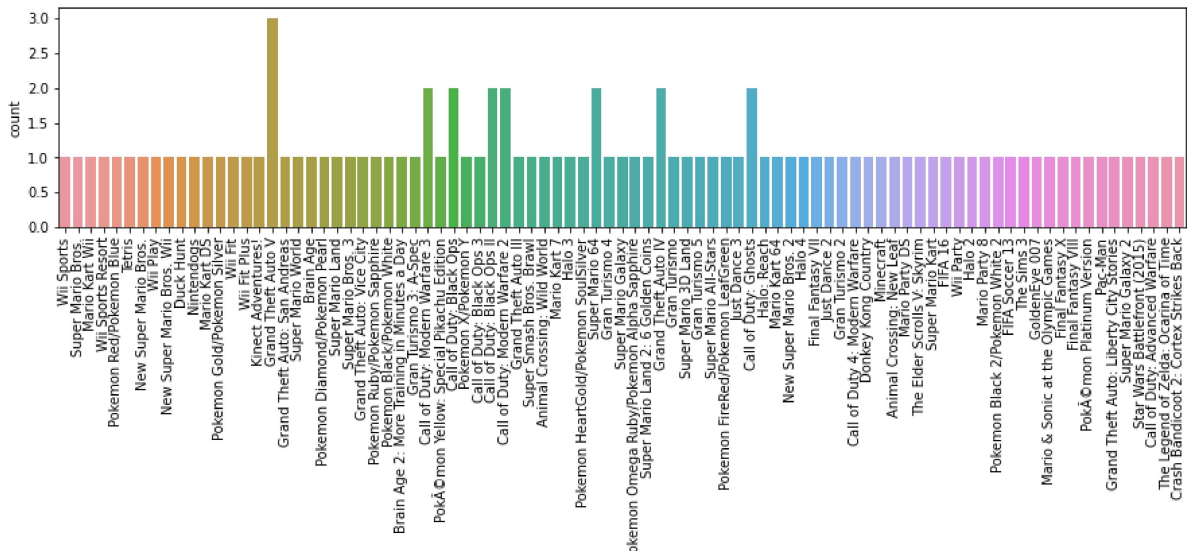
# Count the names

In [25]:
```
data.Name.value_counts()
```

Out[25]:
```
Grand Theft Auto V                      3
Call of Duty: Black Ops                 2
Call of Duty: Ghosts                    2
Call of Duty: Modern Warfare 2          2
Call of Duty: Black Ops II              2
                                       ..
Pokemon Ruby/Pokemon Sapphire           1
Pokemon Gold/Pokemon Silver             1
Mario & Sonic at the Olympic Games      1
Mario Kart DS                           1
Super Mario Land 2: 6 Golden Coins      1
Name: Name, Length: 87, dtype: int64
```

In [26]:
```
plt.figure(figsize=(15,3))
sns.countplot(data["Name"])
plt.xticks(rotation=90)
```

```
Text(84, 0, 'Call of Duty: Advanced Warfare'),
Text(85, 0, 'The Legend of Zelda: Ocarina of Time'),
Text(86, 0, 'Crash Bandicoot 2: Cortex Strikes Back')])
```




# To print random data

In [27]:
```
data.sample(5)
```

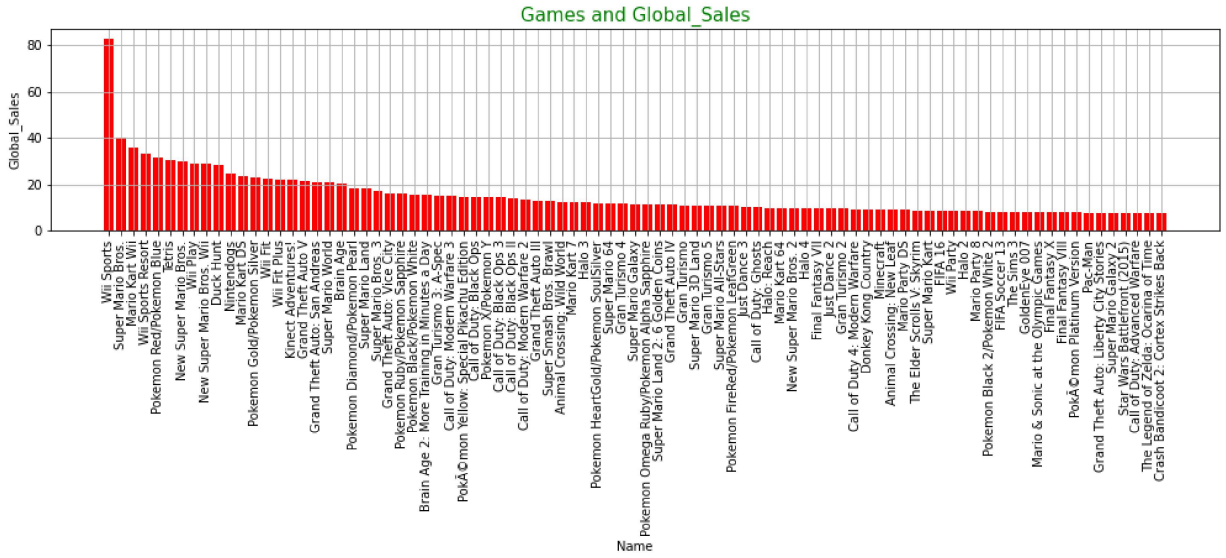
Out[27]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_S |
|---|---|---|---|---|---|---|---|---|---|---|
| **90** | 91 | Grand Theft Auto: Liberty City Stories | PSP | 2005 | Action | Take-Two Interactive | 2.90 | 2.83 | 0.24 | |
| **70** | 71 | Call of Duty 4: Modern Warfare | X360 | 2007 | Shooter | Activision | 5.91 | 2.38 | 0.13 | |
| **63** | 64 | Mario Kart 64 | N64 | 1996 | Racing | Nintendo | 5.55 | 1.94 | 2.23 | |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 | |
| **84** | 85 | GoldenEye 007 | N64 | 1997 | Shooter | Nintendo | 5.80 | 2.01 | 0.13 | |

# GLOBAL SALES

## Games and Global Sales

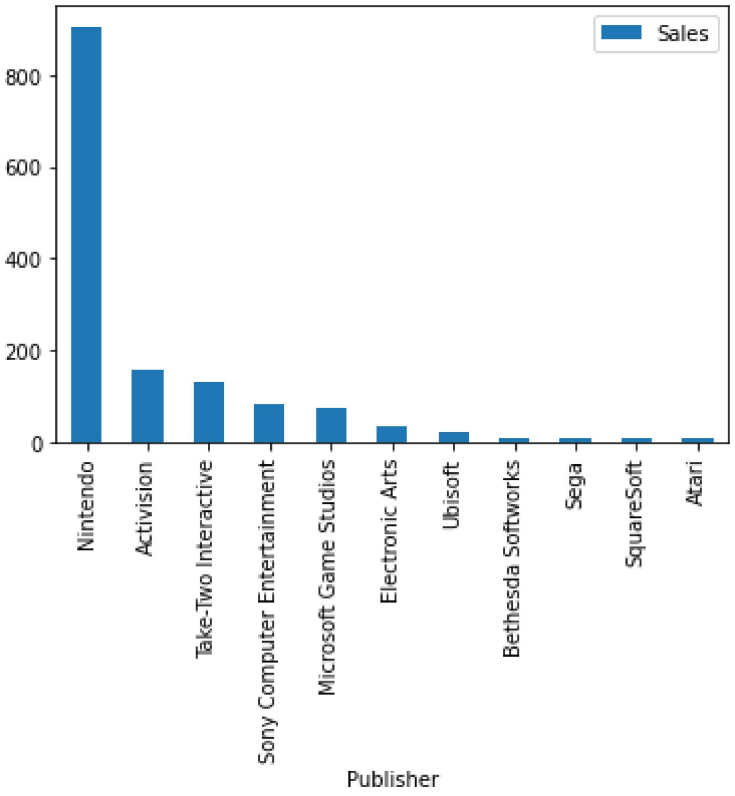
In [28]:
```
plt.figure(figsize=(17,3))
plt.bar(data['Name'],data['Global_Sales'],color='r')
plt.title('Games and Global_Sales',fontsize=15,color='green')
plt.xlabel("Name",fontsize=10,color='black')
plt.xticks(rotation=90)
plt.ylabel("Global_Sales",fontsize=10,color='black')
plt.grid(True)
plt.show()
```




# Plot for Publisher and Global Sales

In [29]:
```
tp=data.groupby("Publisher")["Global_Sales"].sum().to_frame(name='Sales')
tp.sort_values(by='Sales',ascending=False)[0:20].plot.bar()
```

Out[29]:
```
<AxesSubplot:xlabel='Publisher'>
```




## List of Genres

In [30]:
```
data['Genre'].unique()
```

Out[30]:
```
array(['Sports', 'Platform', 'Racing', 'Role-Playing', 'Puzzle', 'Misc',
       'Shooter', 'Simulation', 'Action', 'Fighting', 'Adventure'],
      dtype=object)
```

## Top Genres

In [31]:
```
data.sort_values("Genre").head()
```

Out[31]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | O |
|---|---|---|---|---|---|---|---|---|---|---|
| **45** | 46 | Pokemon HeartGold/Pokemon SoulSilver | DS | 2009 | Action | Nintendo | 4.40 | 2.77 | 3.96 | |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0.47 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **90** | 91 | Grand Theft Auto: Liberty City Stories | PSP | 2005 | Action | Take-Two Interactive | 2.90 | 2.83 | 0.24 | |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0.06 | |

## To show the maximum values of Global sales

In [32]:
```
data.sort_values('Global_Sales',ascending=False).head()
```

Out[32]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |

## Mean of global sales

In [33]:
```
data['Global_Sales'].mean()
```

Out[33]:
```
14.920416666666656
```

## Games details which are below the average of global sales

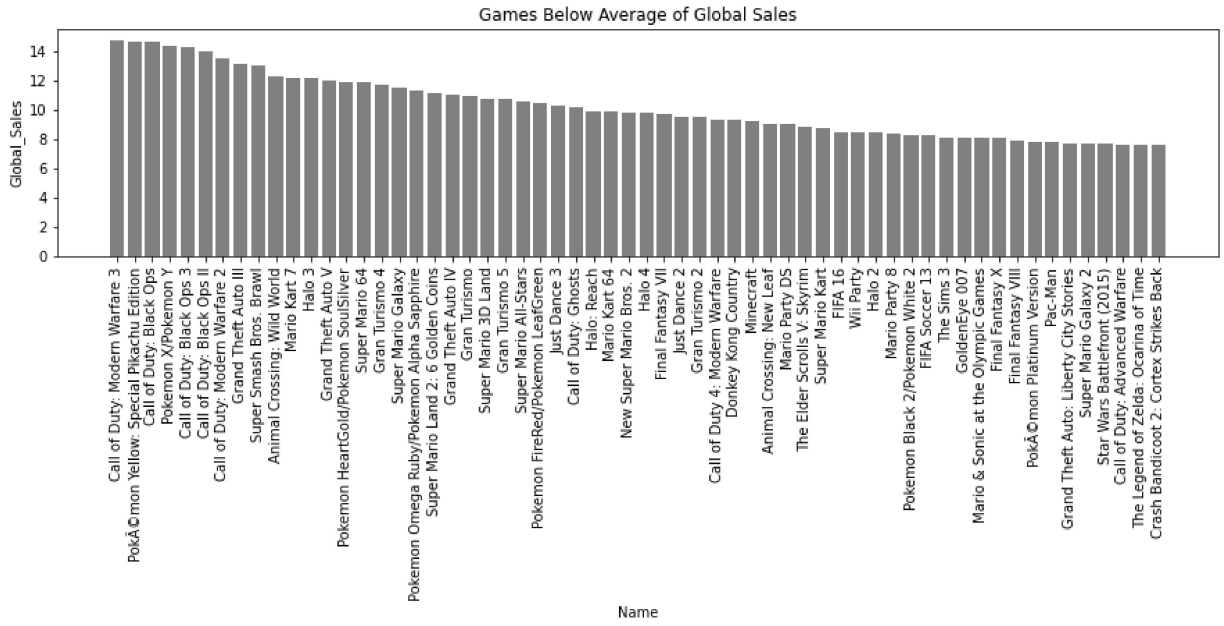
In [34]:
```
less_global=data[data['Global_Sales']<data['Global_Sales'].mean()]
less_global
```

Out[34]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Othe |
|---|---|---|---|---|---|---|---|---|---|---|
| **29** | 30 | Call of Duty: Modern Warfare 3 | X360 | 2011 | Shooter | Activision | 9.03 | 4.28 | 0.13 | |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3.12 | |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4.34 | |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0.35 | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

67 rows × 11 columns

In [35]:
```
plt.figure(figsize=(15,3))
plt.bar(less_global['Name'],less_global['Global_Sales'],color='Grey')


plt.xlabel('Name')
plt.ylabel('Global_Sales')
plt.title('Games Below Average of Global Sales')
plt.xticks(rotation=90)
plt.show()
```



In [36]:
```
d1=pd.DataFrame(less_global)
d1
```

Out[36]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Othe |
|---|---|---|---|---|---|---|---|---|---|---|
| **29** | 30 | Call of Duty: Modern Warfare 3 | X360 | 2011 | Shooter | Activision | 9.03 | 4.28 | 0.13 | |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3.12 | |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4.34 | |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0.35 | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

67 rows × 11 columns

In [37]:
```
d=less_global['Genre'].value_counts()
d
```

Out[37]:
```
Shooter         19
Role-Playing    10
Platform         9
Action           8
Racing           7
Misc             6
Simulation       3
Sports           2
Puzzle           1
Fighting         1
Adventure        1
Name: Genre, dtype: int64
```

## Games details which are than greater than average global sales

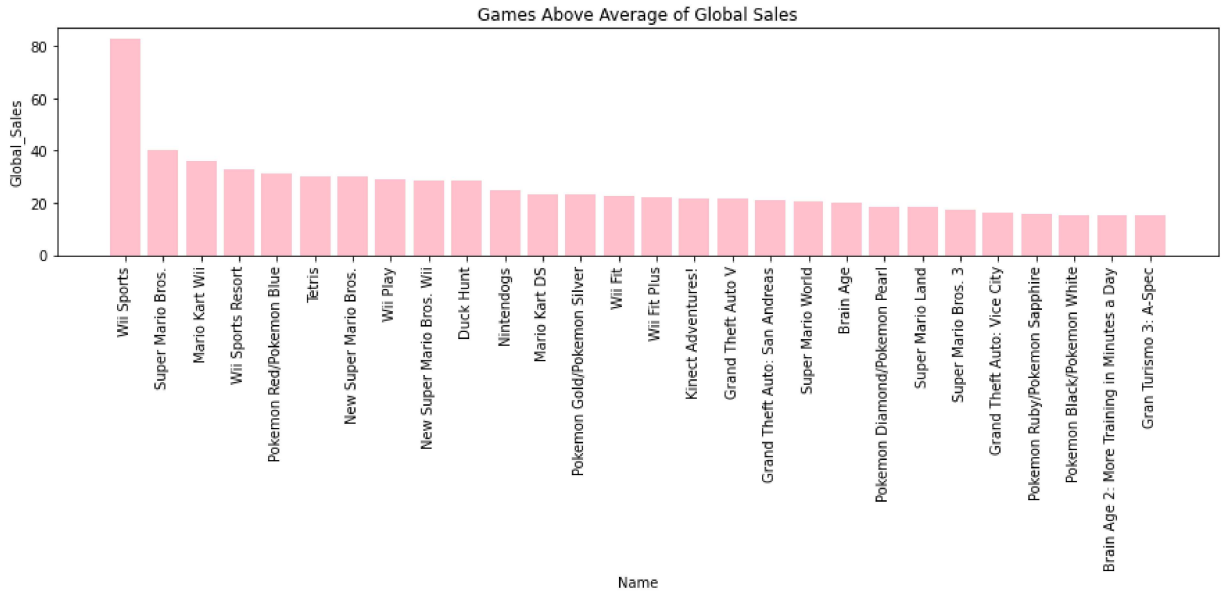
In [38]:
```
greater_global=data[data['Global_Sales']>data['Global_Sales'].mean()]
greater_global
```

Out[38]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3. |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6. |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3. |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3. |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10. |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4. |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6. |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2. |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4. |
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0. |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1. |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4. |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7. |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3. |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2. |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0. |
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0. |
| **17** | 18 | Grand Theft Auto: San Andreas | PS2 | 2004 | Action | Take-Two Interactive | 9.43 | 0.40 | 0. |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3. |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4. |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6. |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4. |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3. |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0. |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0. |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5. |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5. |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5. |
| **28** | 29 | Gran Turismo 3: A-Spec | PS2 | 2001 | Racing | Sony Computer Entertainment | 6.85 | 5.09 | 1. |

In [39]:
```
plt.figure(figsize=(15,3))
plt.bar(greater_global['Name'],greater_global['Global_Sales'],color='Pink')


plt.xlabel('Name')
plt.ylabel('Global_Sales')
plt.title('Games Above Average of Global Sales')
plt.xticks(rotation=90)
plt.show()
```




# To show the frequency of Genre above the average global sales

In [40]:
```
greater_global['Genre'].value_counts()
```

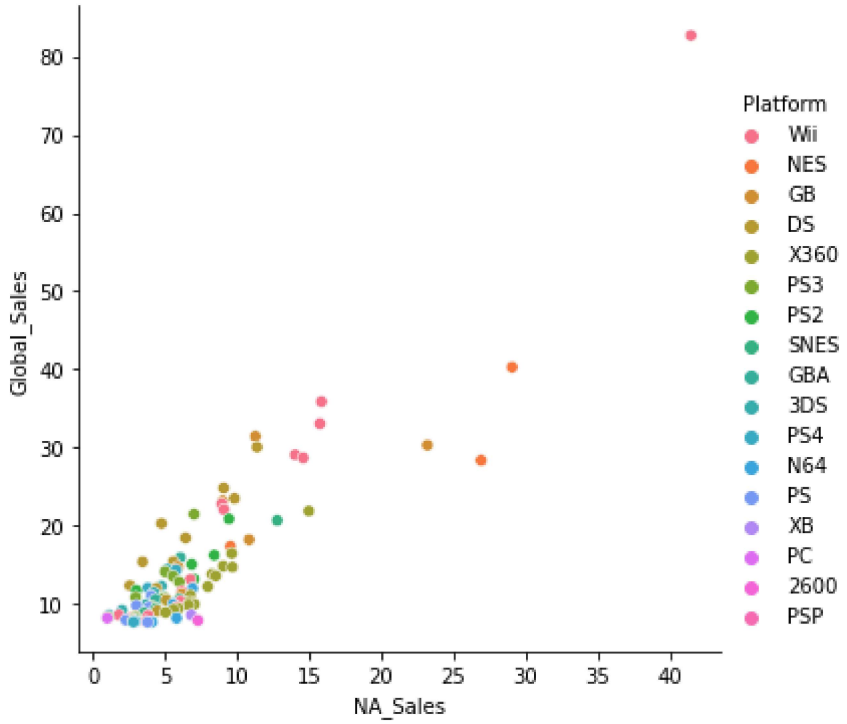
Out[40]:
```
Platform        6
Role-Playing    5
Action          4
Sports          4
Racing          3
Misc            3
Puzzle          2
Shooter         1
Simulation      1
Name: Genre, dtype: int64
```

# NORTH AMERICA

## Relational Plot Between North American Sales and Global Sales with Hue as Platform

In [41]:
```
plt.figure(figsize=(16,18))
sns.relplot(x="NA_Sales",y="Global_Sales",hue='Platform',data=data)
plt.show()
```

```
<Figure size 1152x1296 with 0 Axes>
```




## Top Genres in North America

In [42]:
```
top_US =data[['Name','Platform','Year','Genre','Publisher','NA_Sales']].sort_valu
top_Genres=top_US.groupby('Genre')['NA_Sales'].sum().to_frame(name='NA').sort_va
print(top_Genres)
```

```
                NA
Genre
Shooter     146.37
Platform    132.69
Sports       78.96
Role-Playing 76.91
Action       69.25
Misc         61.28
Racing       60.21
Puzzle       33.92
Simulation   14.61
Fighting      6.75
Adventure     6.16
```

## To show the maximum values of NA sales

In [43]:
```
data.sort_values('NA_Sales',ascending=False).head(5)
```

Out[43]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | 8.46 |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | 0.77 |
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 | 0.47 |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 | 0.58 |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | 3.31 |

# Mean value of NA sales

In [44]:
```
data['NA_Sales'].mean()
```

Out[44]:
```
7.157395833333332
```

## Games details which are above average sales of North America

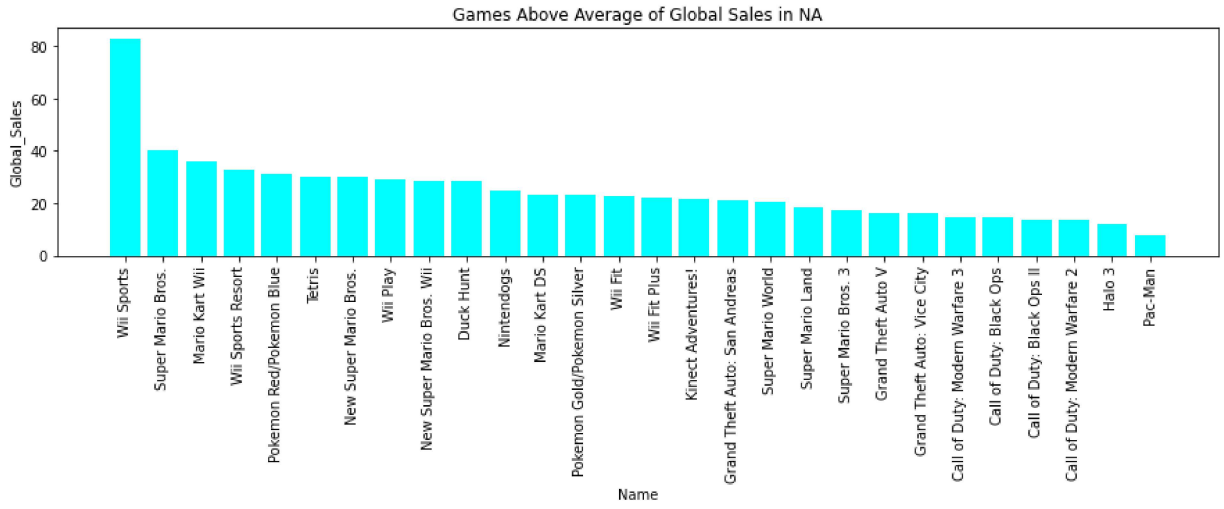
In [45]:
```
greater_NA=data[data['NA_Sales']>data['NA_Sales'].mean()]
greater_NA
```

Out[45]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Otl |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 | |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6.50 | |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2.93 | |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4.70 | |
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 | |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 | |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4.13 | |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7.20 | |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 | |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 | |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0.24 | |
| **17** | 18 | Grand Theft Auto: San Andreas | PS2 | 2004 | Action | Take-Two Interactive | 9.43 | 0.40 | 0.41 | |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3.54 | |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4.18 | |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3.84 | |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0.06 | |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0.47 | |
| **29** | 30 | Call of Duty: Modern Warfare 3 | X360 | 2011 | Shooter | Activision | 9.03 | 4.28 | 0.13 | |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Otl |
|---|---|---|---|---|---|---|---|---|---|---|
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **35** | 36 | Call of Duty: Black Ops II | X360 | 2012 | Shooter | Activision | 8.25 | 4.30 | 0.07 | |
| **36** | 37 | Call of Duty: Modern Warfare 2 | X360 | 2009 | Shooter | Activision | 8.52 | 3.63 | 0.08 | |
| **43** | 44 | Halo 3 | X360 | 2007 | Shooter | Microsoft Game Studios | 7.97 | 2.83 | 0.13 | |
| **89** | 90 | Pac-Man | 2600 | 1982 | Puzzle | Atari | 7.28 | 0.45 | 0.00 | |

In [46]:
```
plt.figure(figsize=(15,3))
plt.bar(greater_NA['Name'],greater_NA['Global_Sales'],color='Cyan')


plt.xlabel('Name')
plt.ylabel('Global_Sales')
plt.title('Games Above Average of Global Sales in NA')
plt.xticks(rotation=90)
plt.show()
```




# To show the frequency of genre above the average of North American sales

In [47]:
```
greater_NA['Genre'].value_counts()
```

Out[47]:
```
Shooter         6
Platform        6
Sports          4
Action          3
Racing          2
Misc            2
Puzzle          2
Role-Playing    2
Simulation      1
Name: Genre, dtype: int64
```

## Game details which are below the average of North American sales

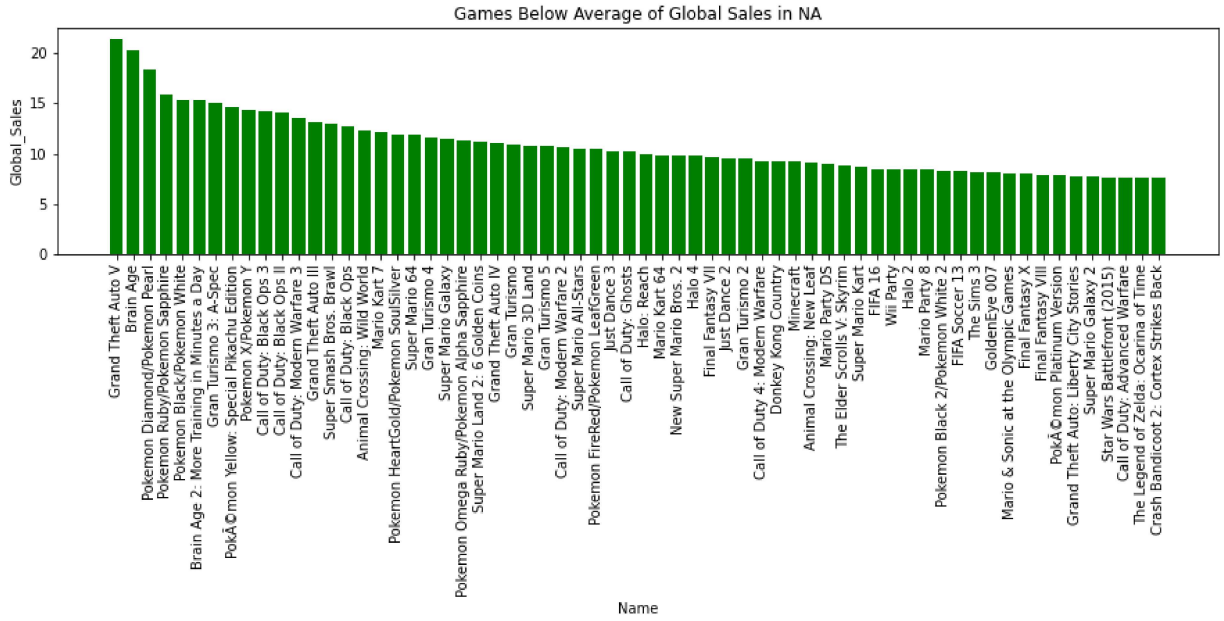
In [48]:
```
less_NA=data[data['NA_Sales']<data['NA_Sales'].mean()]
less_NA
```

Out[48]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0.97 |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4.16 |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6.04 |
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5.38 |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5.65 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 |

68 rows × 11 columns

In [49]:
```
plt.figure(figsize=(15,3))
plt.bar(less_NA['Name'],less_NA['Global_Sales'],color='Green')


plt.xlabel('Name')
plt.ylabel('Global_Sales')
plt.title('Games Below Average of Global Sales in NA')
plt.xticks(rotation=90)
plt.show()
```




## To show the frequency of genre below the average sales of North America

In [50]:
```
less_NA['Genre'].value_counts()
```

Out[50]:
```
Shooter         14
Role-Playing    13
Action           9
Platform         9
Racing           8
Misc             7
Simulation       3
Sports           2
Puzzle           1
Fighting         1
Adventure        1
Name: Genre, dtype: int64
```

# EUROPE

## Top Genres in Europe

In [51]:
```
top_EU=data[['Name','Platform','Year','Genre','Publisher','EU_Sales']].sort_value
top_EU_genres=top_EU.groupby('Genre')['EU_Sales'].sum().to_frame(name='EU').sort_
print(top_EU_genres)
```

```
                EU
Genre
Shooter      68.25
Sports       66.61
Role-Playing 54.64
Platform     53.64
Action       50.19
Racing       44.81
Misc         39.98
Simulation   23.26
Puzzle        8.07
Fighting      2.61
Adventure     2.04
```

## To show the maximum values of EU sales

In [52]:
```
data.sort_values('EU_Sales',ascending=False).head()
```

Out[52]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 | |
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0.97 | |

## Mean of European Sales

In [53]:
```
data['EU_Sales'].mean()
```

Out[53]:
```
4.3135416666666675
```

## Game details which are above the average sales of Europe

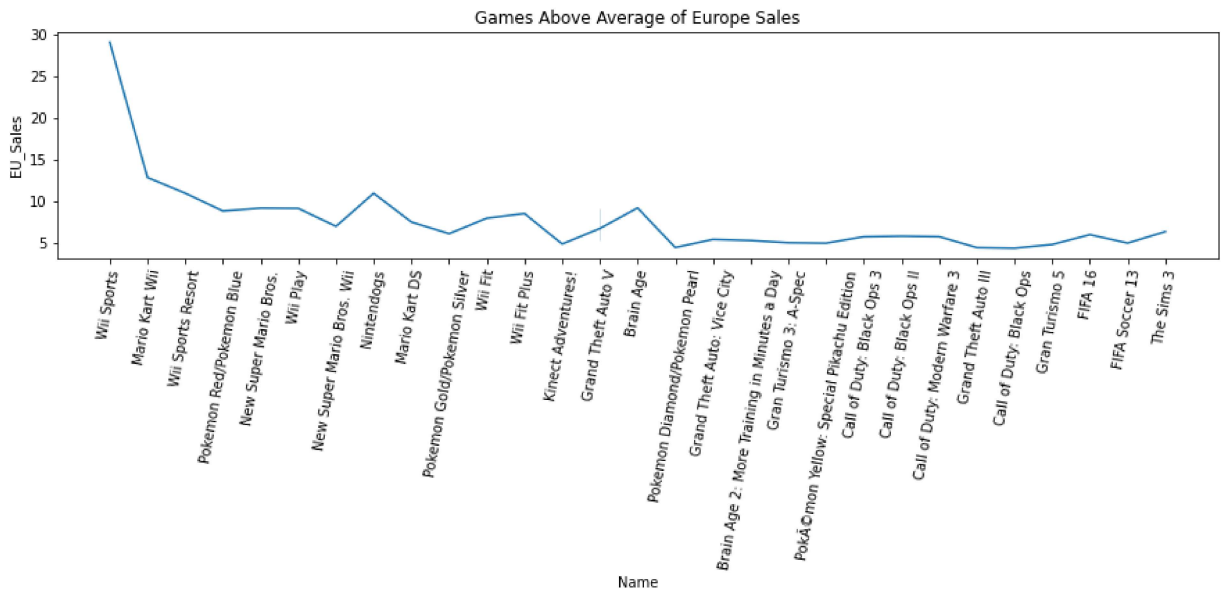
In [54]:
```
greater_EU=data[data['EU_Sales']>data['EU_Sales'].mean()]
greater_EU
```

Out[54]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3. |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3. |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3. |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10. |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6. |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2. |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4. |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1. |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4. |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7. |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3. |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2. |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0. |
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0. |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4. |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6. |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0. |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0. |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5. |
| **28** | 29 | Gran Turismo 3: A-Spec | PS2 | 2001 | Racing | Sony Computer Entertainment | 6.85 | 5.09 | 1. |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3. |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0. |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **34** | 35 | Call of Duty: Black Ops II | PS3 | 2012 | Shooter | Activision | 4.99 | 5.88 | 0. |
| **37** | 38 | Call of Duty: Modern Warfare 3 | PS3 | 2011 | Shooter | Activision | 5.54 | 5.82 | 0. |
| **38** | 39 | Grand Theft Auto III | PS2 | 2001 | Action | Take-Two Interactive | 6.99 | 4.51 | 0. |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0. |
| **44** | 45 | Grand Theft Auto V | PS4 | 2014 | Action | Take-Two Interactive | 3.80 | 5.81 | 0. |
| **54** | 55 | Gran Turismo 5 | PS3 | 2010 | Racing | Sony Computer Entertainment | 2.96 | 4.88 | 0. |
| **77** | 78 | FIFA 16 | PS4 | 2015 | Sports | Electronic Arts | 1.11 | 6.06 | 0. |
| **82** | 83 | FIFA Soccer 13 | PS3 | 2012 | Action | Electronic Arts | 1.06 | 5.05 | 0. |
| **83** | 84 | The Sims 3 | PC | 2009 | Simulation | Electronic Arts | 0.98 | 6.42 | 0. |

In [55]:
```
plt.figure(figsize=(15,3))
sns.lineplot(x='Name',y='EU_Sales',data=greater_EU)
plt.xticks(rotation=80)
plt.title('Games Above Average of Europe Sales')
plt.show()
```




# To show the frequency of genre above the average sale in Europe

In [56]:
```
greater_EU['Genre'].value_counts()
```

Out[56]:
```
Action          6
Sports          5
Shooter         4
Role-Playing    4
Racing          4
Misc            3
Simulation      2
Platform        2
Puzzle          1
Name: Genre, dtype: int64
```

## Game details which are below the average sales in Europe

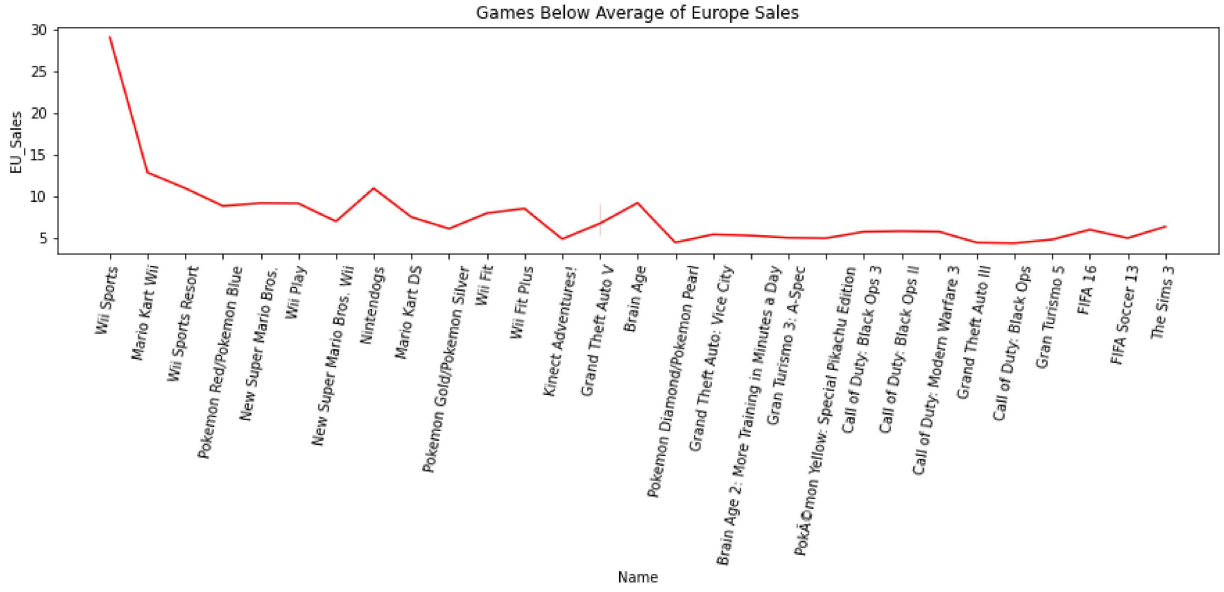
In [57]:
```
less_EU=data[data['EU_Sales']>data['EU_Sales'].mean()]
less_EU
```

Out[57]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3. |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3. |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3. |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10. |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6. |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2. |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4. |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1. |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4. |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7. |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3. |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2. |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0. |
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0. |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4. |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6. |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0. |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0. |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5. |
| **28** | 29 | Gran Turismo 3: A-Spec | PS2 | 2001 | Racing | Sony Computer Entertainment | 6.85 | 5.09 | 1. |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3. |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0. |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sal |
|---|---|---|---|---|---|---|---|---|---|
| **34** | 35 | Call of Duty: Black Ops II | PS3 | 2012 | Shooter | Activision | 4.99 | 5.88 | 0. |
| **37** | 38 | Call of Duty: Modern Warfare 3 | PS3 | 2011 | Shooter | Activision | 5.54 | 5.82 | 0. |
| **38** | 39 | Grand Theft Auto III | PS2 | 2001 | Action | Take-Two Interactive | 6.99 | 4.51 | 0. |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0. |
| **44** | 45 | Grand Theft Auto V | PS4 | 2014 | Action | Take-Two Interactive | 3.80 | 5.81 | 0. |
| **54** | 55 | Gran Turismo 5 | PS3 | 2010 | Racing | Sony Computer Entertainment | 2.96 | 4.88 | 0. |
| **77** | 78 | FIFA 16 | PS4 | 2015 | Sports | Electronic Arts | 1.11 | 6.06 | 0. |
| **82** | 83 | FIFA Soccer 13 | PS3 | 2012 | Action | Electronic Arts | 1.06 | 5.05 | 0. |
| **83** | 84 | The Sims 3 | PC | 2009 | Simulation | Electronic Arts | 0.98 | 6.42 | 0. |

In [58]:
```
plt.figure(figsize=(15,3))
sns.lineplot(x='Name',y='EU_Sales',data=less_EU,color='red')
plt.xticks(rotation=80)
plt.title('Games Below Average of Europe Sales')
plt.show()
```




# To show the frequency of Genre below the average sales in Europe

In [59]:
```
less_EU['Genre'].value_counts()
```

Out[59]:
```
Action          6
Sports          5
Shooter         4
Role-Playing    4
Racing          4
Misc            3
Simulation      2
Platform        2
Puzzle          1
Name: Genre, dtype: int64
```

# JAPAN

## Top genres in Japan

In [60]:
```
top_JP=data[['Name','Platform','Year','Genre','Publisher','JP_Sales']].sort_value
top_JP_genres=top_JP.groupby('Genre')['JP_Sales'].sum().to_frame(name='JP').sort_
print(top_JP_genres)
```

```
                JP
Genre
Role-Playing  63.75
Platform      45.94
Racing        24.64
Sports        13.90
Misc          13.41
Simulation    11.62
Puzzle         9.54
Action         8.93
Shooter        4.36
Adventure      2.69
Fighting       2.66
```

## To show maximum sales in Japan

In [61]:
```
data.sort_values('JP_Sales',ascending=False).head()
```

Out[61]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | C |
|---|---|---|---|---|---|---|---|---|---|---|
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 | |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7.20 | |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6.50 | |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6.04 | |

## Mean of Sales in Japan

In [62]:
```
data['JP_Sales'].mean()
```

Out[62]:
```
2.0983333333333323
```

## Game details which are above the average sales in Japan¶

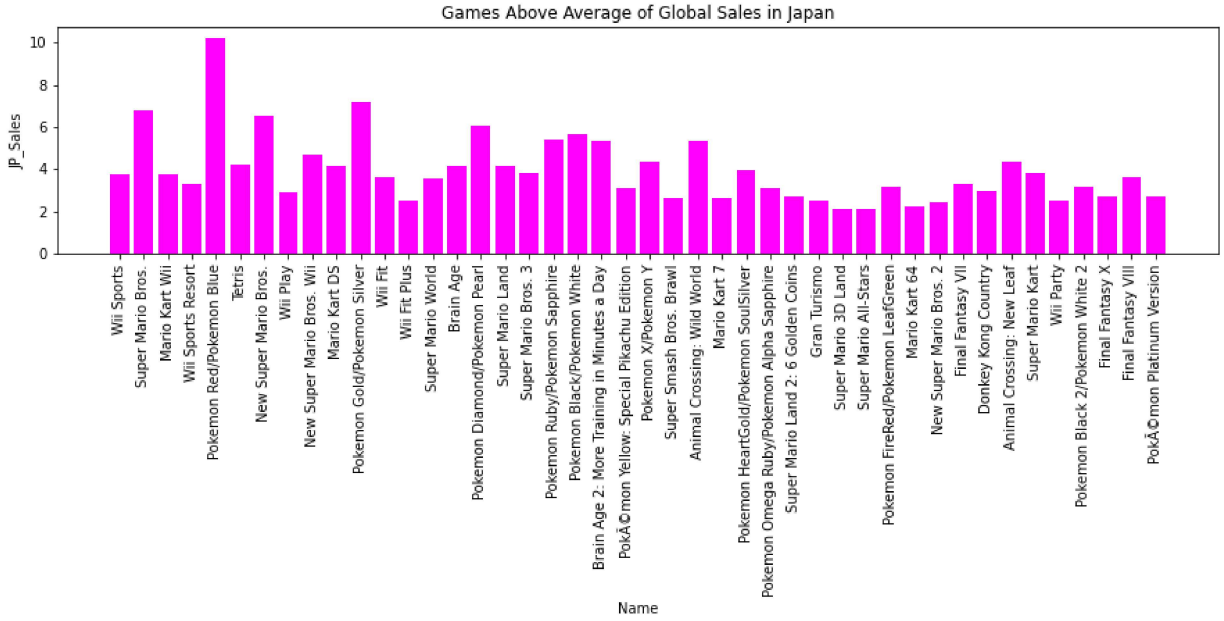
In [63]:
```
greater_JP=data[data['JP_Sales']>data['JP_Sales'].mean()]
greater_JP
```

Out[63]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sa |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3 |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6 |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3 |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3 |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10 |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4 |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6 |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2 |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4 |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4 |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2 |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3 |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4 |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6 |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4 |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3 |
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5 |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5 |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5 |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3 |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4 |
| **39** | 40 | Super Smash Bros. Brawl | Wii | 2008 | Fighting | Nintendo | 6.75 | 2.61 | 2 |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sa |
|---|---|---|---|---|---|---|---|---|---|
| **41** | 42 | Animal Crossing: Wild World | DS | 2005 | Simulation | Nintendo | 2.55 | 3.52 | 5 |
| **42** | 43 | Mario Kart 7 | 3DS | 2011 | Racing | Nintendo | 4.74 | 3.91 | 2 |
| **45** | 46 | Pokemon HeartGold/Pokemon SoulSilver | DS | 2009 | Action | Nintendo | 4.40 | 2.77 | 3 |
| **49** | 50 | Pokemon Omega Ruby/Pokemon Alpha Sapphire | 3DS | 2014 | Role-Playing | Nintendo | 4.23 | 3.37 | 3 |
| **50** | 51 | Super Mario Land 2: 6 Golden Coins | GB | 1992 | Adventure | Nintendo | 6.16 | 2.04 | 2 |
| **52** | 53 | Gran Turismo | PS | 1997 | Racing | Sony Computer Entertainment | 4.02 | 3.87 | 2 |
| **53** | 54 | Super Mario 3D Land | 3DS | 2011 | Platform | Nintendo | 4.89 | 2.99 | 2 |
| **57** | 58 | Super Mario All-Stars | SNES | 1993 | Platform | Nintendo | 5.99 | 2.15 | 2 |
| **58** | 59 | Pokemon FireRed/Pokemon LeafGreen | GBA | 2004 | Role-Playing | Nintendo | 4.34 | 2.65 | 3 |
| **63** | 64 | Mario Kart 64 | N64 | 1996 | Racing | Nintendo | 5.55 | 1.94 | 2 |
| **64** | 65 | New Super Mario Bros. 2 | 3DS | 2012 | Platform | Nintendo | 3.66 | 3.07 | 2 |
| **66** | 67 | Final Fantasy VII | PS | 1997 | Role-Playing | Sony Computer Entertainment | 3.01 | 2.47 | 3 |
| **71** | 72 | Donkey Kong Country | SNES | 1994 | Platform | Nintendo | 4.36 | 1.71 | 3 |
| **73** | 74 | Animal Crossing: New Leaf | 3DS | 2012 | Simulation | Nintendo | 2.01 | 2.32 | 4 |
| **76** | 77 | Super Mario Kart | SNES | 1992 | Racing | Nintendo | 3.54 | 1.24 | 3 |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2 |
| **81** | 82 | Pokemon Black 2/Pokemon White 2 | DS | 2012 | Role-Playing | Nintendo | 2.91 | 1.86 | 3 |
| **86** | 87 | Final Fantasy X | PS2 | 2001 | Role-Playing | Sony Computer Entertainment | 2.91 | 2.07 | 2 |
| **87** | 88 | Final Fantasy VIII | PS | 1999 | Role-Playing | SquareSoft | 2.28 | 1.72 | 3 |
| **88** | 89 | PokÃ©mon Platinum Version | DS | 2008 | Role-Playing | Nintendo | 2.82 | 1.78 | 2 |

In [64]:
```
plt.figure(figsize=(15,3))
plt.bar(greater_JP['Name'],greater_JP['JP_Sales'],color='Magenta')


plt.xlabel('Name')
plt.ylabel('JP_Sales')
plt.title('Games Above Average of Global Sales in Japan')
plt.xticks(rotation=90)
plt.show()
```




# To show the frequency of genre above the average sales in Japan

In [65]:
```
greater_JP['Genre'].value_counts()
```

Out[65]:
```
Role-Playing    14
Platform        10
Racing           6
Sports           4
Misc             3
Simulation       2
Puzzle           2
Action           1
Fighting         1
Adventure        1
Name: Genre, dtype: int64
```

# Game details which are below the average sales in Japan¶

In [66]:
```
less_JP=data[data['JP_Sales']<data['JP_Sales'].mean()]
less_JP
```

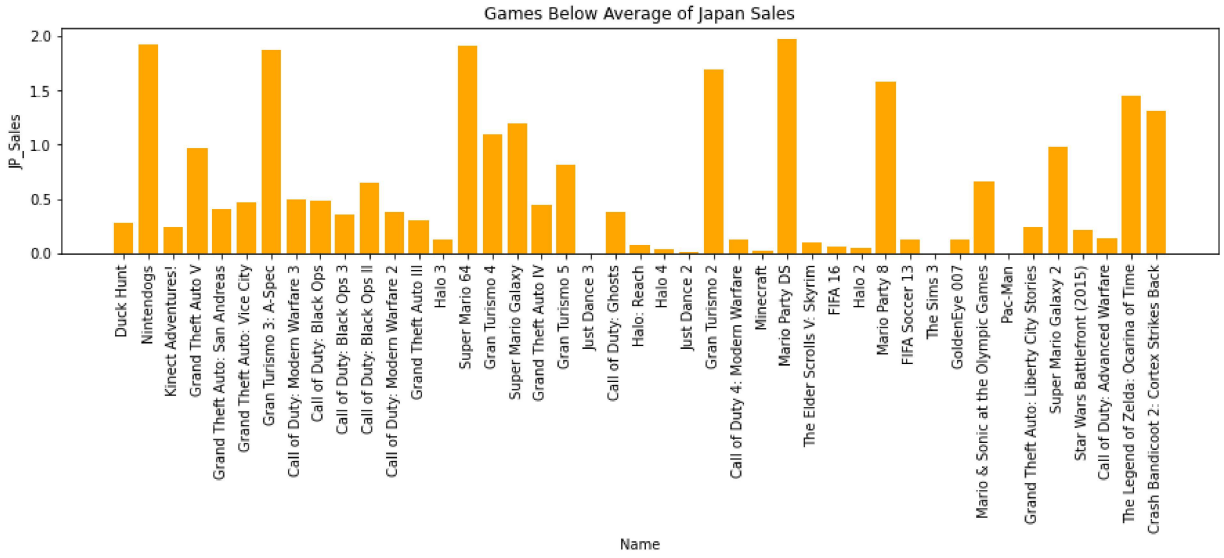
Out[66]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Ot |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 | |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 | |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0.24 | |
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0.97 | |
| **17** | 18 | Grand Theft Auto: San Andreas | PS2 | 2004 | Action | Take-Two Interactive | 9.43 | 0.40 | 0.41 | |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0.06 | |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0.47 | |
| **28** | 29 | Gran Turismo 3: A-Spec | PS2 | 2001 | Racing | Sony Computer Entertainment | 6.85 | 5.09 | 1.87 | |
| **29** | 30 | Call of Duty: Modern Warfare 3 | X360 | 2011 | Shooter | Activision | 9.03 | 4.28 | 0.13 | |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0.35 | |
| **34** | 35 | Call of Duty: Black Ops II | PS3 | 2012 | Shooter | Activision | 4.99 | 5.88 | 0.65 | |
| **35** | 36 | Call of Duty: Black Ops II | X360 | 2012 | Shooter | Activision | 8.25 | 4.30 | 0.07 | |
| **36** | 37 | Call of Duty: Modern Warfare 2 | X360 | 2009 | Shooter | Activision | 8.52 | 3.63 | 0.08 | |
| **37** | 38 | Call of Duty: Modern Warfare 3 | PS3 | 2011 | Shooter | Activision | 5.54 | 5.82 | 0.49 | |
| **38** | 39 | Grand Theft Auto III | PS2 | 2001 | Action | Take-Two Interactive | 6.99 | 4.51 | 0.30 | |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0.48 | |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Ot |
|---|---|---|---|---|---|---|---|---|---|---|
| **43** | 44 | Halo 3 | X360 | 2007 | Shooter | Microsoft Game Studios | 7.97 | 2.83 | 0.13 | |
| **44** | 45 | Grand Theft Auto V | PS4 | 2014 | Action | Take-Two Interactive | 3.80 | 5.81 | 0.36 | |
| **46** | 47 | Super Mario 64 | N64 | 1996 | Platform | Nintendo | 6.91 | 2.85 | 1.91 | |
| **47** | 48 | Gran Turismo 4 | PS2 | 2004 | Racing | Sony Computer Entertainment | 3.01 | 0.01 | 1.10 | |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 | |
| **51** | 52 | Grand Theft Auto IV | X360 | 2008 | Action | Take-Two Interactive | 6.76 | 3.10 | 0.14 | |
| **54** | 55 | Gran Turismo 5 | PS3 | 2010 | Racing | Sony Computer Entertainment | 2.96 | 4.88 | 0.81 | |
| **55** | 56 | Call of Duty: Modern Warfare 2 | PS3 | 2009 | Shooter | Activision | 4.99 | 3.69 | 0.38 | |
| **56** | 57 | Grand Theft Auto IV | PS3 | 2008 | Action | Take-Two Interactive | 4.76 | 3.76 | 0.44 | |
| **59** | 60 | Super Mario 64 | DS | 2004 | Platform | Nintendo | 5.08 | 3.11 | 1.25 | |
| **60** | 61 | Just Dance 3 | Wii | 2011 | Misc | Ubisoft | 6.05 | 3.15 | 0.00 | |
| **61** | 62 | Call of Duty: Ghosts | X360 | 2013 | Shooter | Activision | 6.72 | 2.63 | 0.04 | |
| **62** | 63 | Halo: Reach | X360 | 2010 | Shooter | Microsoft Game Studios | 7.03 | 1.98 | 0.08 | |
| **65** | 66 | Halo 4 | X360 | 2012 | Shooter | Microsoft Game Studios | 6.63 | 2.36 | 0.04 | |
| **67** | 68 | Call of Duty: Ghosts | PS3 | 2013 | Shooter | Activision | 4.09 | 3.73 | 0.38 | |
| **68** | 69 | Just Dance 2 | Wii | 2010 | Misc | Ubisoft | 5.84 | 2.89 | 0.01 | |
| **69** | 70 | Gran Turismo 2 | PS | 1999 | Racing | Sony Computer Entertainment | 3.88 | 3.42 | 1.69 | |
| **70** | 71 | Call of Duty 4: Modern Warfare | X360 | 2007 | Shooter | Activision | 5.91 | 2.38 | 0.13 | |
| **72** | 73 | Minecraft | X360 | 2013 | Misc | Microsoft Game Studios | 5.58 | 2.83 | 0.02 | |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Ot |
|---|---|---|---|---|---|---|---|---|---|---|
| **74** | 75 | Mario Party DS | DS | 2007 | Misc | Nintendo | 4.46 | 1.88 | 1.98 | |
| **75** | 76 | The Elder Scrolls V: Skyrim | X360 | 2011 | Role-Playing | Bethesda Softworks | 5.03 | 2.86 | 0.10 | |
| **77** | 78 | FIFA 16 | PS4 | 2015 | Sports | Electronic Arts | 1.11 | 6.06 | 0.06 | |
| **79** | 80 | Halo 2 | XB | 2004 | Shooter | Microsoft Game Studios | 6.82 | 1.53 | 0.05 | |
| **80** | 81 | Mario Party 8 | Wii | 2007 | Misc | Nintendo | 3.81 | 2.30 | 1.58 | |
| **82** | 83 | FIFA Soccer 13 | PS3 | 2012 | Action | Electronic Arts | 1.06 | 5.05 | 0.13 | |
| **83** | 84 | The Sims 3 | PC | 2009 | Simulation | Electronic Arts | 0.98 | 6.42 | 0.00 | |
| **84** | 85 | GoldenEye 007 | N64 | 1997 | Shooter | Nintendo | 5.80 | 2.01 | 0.13 | |
| **85** | 86 | Mario & Sonic at the Olympic Games | Wii | 2007 | Sports | Sega | 2.58 | 3.90 | 0.66 | |
| **89** | 90 | Pac-Man | 2600 | 1982 | Puzzle | Atari | 7.28 | 0.45 | 0.00 | |
| **90** | 91 | Grand Theft Auto: Liberty City Stories | PSP | 2005 | Action | Take-Two Interactive | 2.90 | 2.83 | 0.24 | |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

In [67]:
```
plt.figure(figsize=(15,3))
plt.bar(less_JP['Name'],less_JP['JP_Sales'],color='Orange')


plt.xlabel('Name')
plt.ylabel('JP_Sales')
plt.title('Games Below Average of Japan Sales')
plt.xticks(rotation=90)
plt.show()
```




# To show the frequency of genre below the average sales in Japan

In [68]:
```
less_JP['Genre'].value_counts()
```

Out[68]:
```
Shooter         20
Action          11
Misc             6
Platform         5
Racing           4
Simulation       2
Sports           2
Puzzle           1
Role-Playing     1
Name: Genre, dtype: int64
```

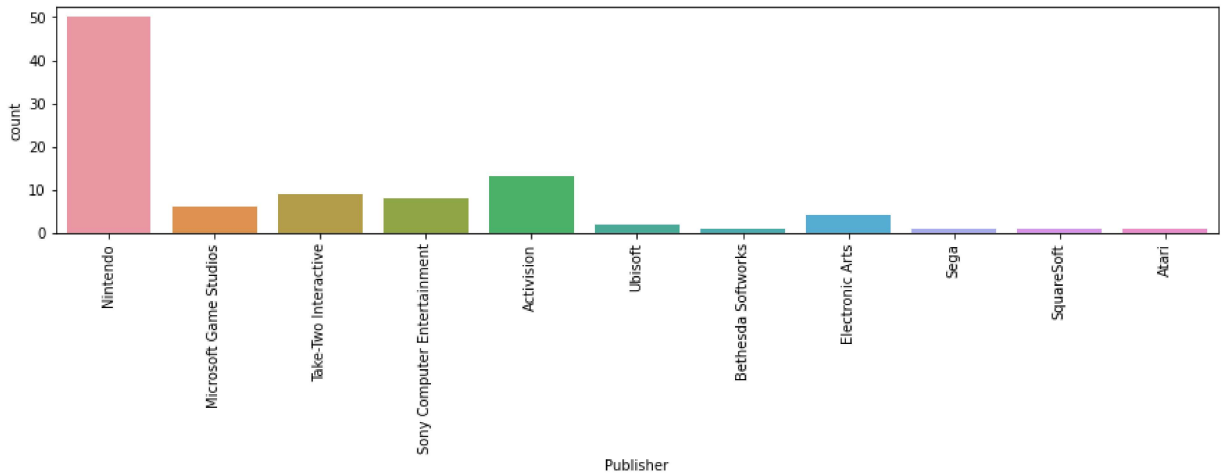
# To show the publisher of most number of video games

In [69]:
```
data['Publisher'].value_counts()
```

Out[69]:
```
Nintendo                        50
Activision                      13
Take-Two Interactive             9
Sony Computer Entertainment      8
Microsoft Game Studios           6
Electronic Arts                  4
Ubisoft                          2
Sega                             1
Atari                            1
Bethesda Softworks               1
SquareSoft                       1
Name: Publisher, dtype: int64
```

In [70]:
```
plt.figure(figsize=(15,3))
sns.countplot(data["Publisher"])
plt.xticks(rotation=90)
```

Out[70]:
```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10]),
 [Text(0, 0, 'Nintendo'),
  Text(1, 0, 'Microsoft Game Studios'),
  Text(2, 0, 'Take-Two Interactive'),
  Text(3, 0, 'Sony Computer Entertainment'),
  Text(4, 0, 'Activision'),
  Text(5, 0, 'Ubisoft'),
  Text(6, 0, 'Bethesda Softworks'),
  Text(7, 0, 'Electronic Arts'),
  Text(8, 0, 'Sega'),
  Text(9, 0, 'SquareSoft'),
  Text(10, 0, 'Atari')])
```




# Informations of publisher Nintendo

In [71]:
```
data_nintendo=data[data['Publisher']=='Nintendo']
data_nintendo
```

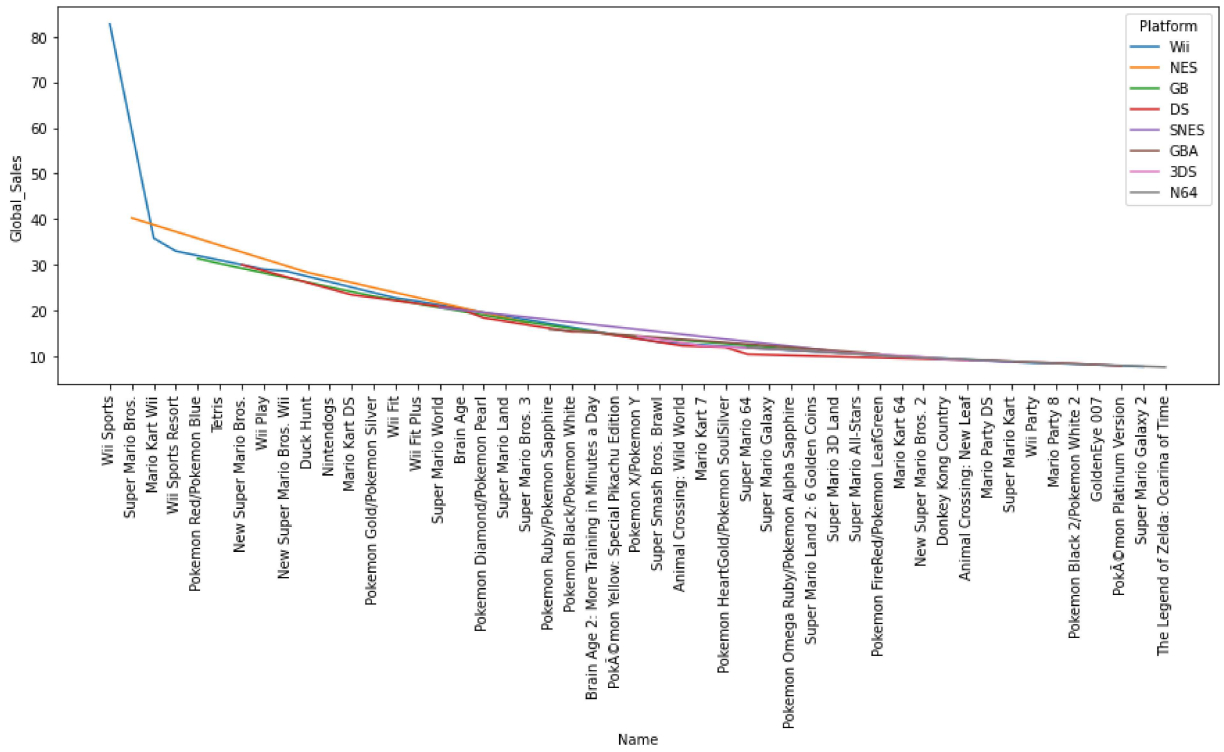
Out[71]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6.50 |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2.93 |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4.70 |
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4.13 |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7.20 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3.54 |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4.16 |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6.04 |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4.18 |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3.84 |
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5.38 |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5.65 |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5.32 |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3.12 |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4.34 |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **39** | 40 | Super Smash Bros. Brawl | Wii | 2008 | Fighting | Nintendo | 6.75 | 2.61 | 2.66 |
| **41** | 42 | Animal Crossing: Wild World | DS | 2005 | Simulation | Nintendo | 2.55 | 3.52 | 5.33 |
| **42** | 43 | Mario Kart 7 | 3DS | 2011 | Racing | Nintendo | 4.74 | 3.91 | 2.67 |
| **45** | 46 | Pokemon HeartGold/Pokemon SoulSilver | DS | 2009 | Action | Nintendo | 4.40 | 2.77 | 3.96 |
| **46** | 47 | Super Mario 64 | N64 | 1996 | Platform | Nintendo | 6.91 | 2.85 | 1.91 |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 |
| **49** | 50 | Pokemon Omega Ruby/Pokemon Alpha Sapphire | 3DS | 2014 | Role-Playing | Nintendo | 4.23 | 3.37 | 3.08 |
| **50** | 51 | Super Mario Land 2: 6 Golden Coins | GB | 1992 | Adventure | Nintendo | 6.16 | 2.04 | 2.69 |
| **53** | 54 | Super Mario 3D Land | 3DS | 2011 | Platform | Nintendo | 4.89 | 2.99 | 2.13 |
| **57** | 58 | Super Mario All-Stars | SNES | 1993 | Platform | Nintendo | 5.99 | 2.15 | 2.12 |
| **58** | 59 | Pokemon FireRed/Pokemon LeafGreen | GBA | 2004 | Role-Playing | Nintendo | 4.34 | 2.65 | 3.15 |
| **59** | 60 | Super Mario 64 | DS | 2004 | Platform | Nintendo | 5.08 | 3.11 | 1.25 |
| **63** | 64 | Mario Kart 64 | N64 | 1996 | Racing | Nintendo | 5.55 | 1.94 | 2.23 |
| **64** | 65 | New Super Mario Bros. 2 | 3DS | 2012 | Platform | Nintendo | 3.66 | 3.07 | 2.47 |
| **71** | 72 | Donkey Kong Country | SNES | 1994 | Platform | Nintendo | 4.36 | 1.71 | 3.00 |
| **73** | 74 | Animal Crossing: New Leaf | 3DS | 2012 | Simulation | Nintendo | 2.01 | 2.32 | 4.36 |
| **74** | 75 | Mario Party DS | DS | 2007 | Misc | Nintendo | 4.46 | 1.88 | 1.98 |
| **76** | 77 | Super Mario Kart | SNES | 1992 | Racing | Nintendo | 3.54 | 1.24 | 3.81 |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2.49 |
| **80** | 81 | Mario Party 8 | Wii | 2007 | Misc | Nintendo | 3.81 | 2.30 | 1.58 |
| **81** | 82 | Pokemon Black 2/Pokemon White 2 | DS | 2012 | Role-Playing | Nintendo | 2.91 | 1.86 | 3.14 |
| **84** | 85 | GoldenEye 007 | N64 | 1997 | Shooter | Nintendo | 5.80 | 2.01 | 0.13 |
| **88** | 89 | PokÃ©mon Platinum Version | DS | 2008 | Role-Playing | Nintendo | 2.82 | 1.78 | 2.69 |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 |

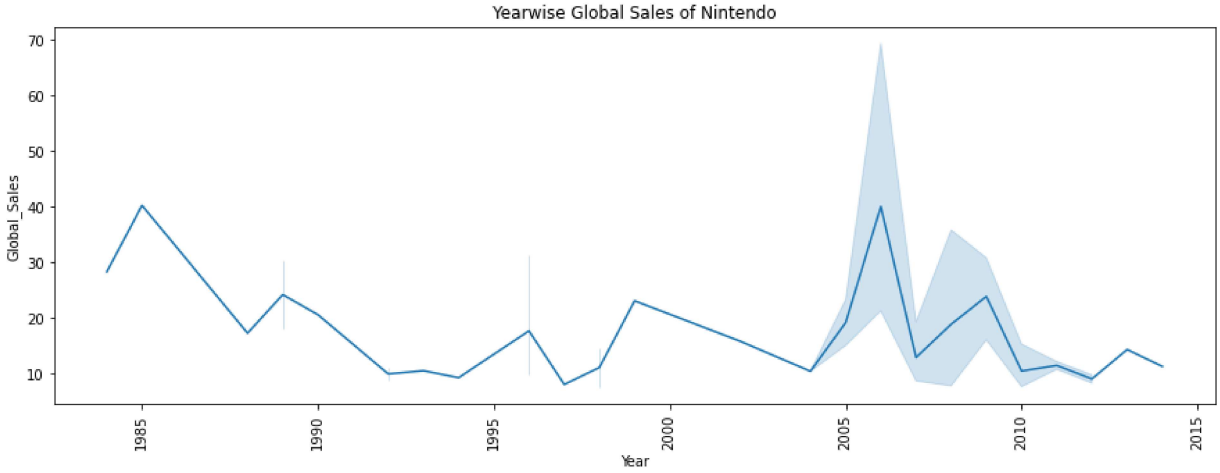
# Line Plot for Game and Global Sales with Platform as Hue for Nintendo

In [72]:
```
plt.figure(figsize=(15,5))
sns.lineplot(x='Name',y='Global_Sales',hue='Platform',data=data_nintendo)
plt.xticks(rotation=90)
plt.show()
```




# Nintendo's Yearwise Global Sales

In [73]:
```
plt.figure(figsize=(15,5))
sns.lineplot(x='Year',y='Global_Sales',data=data_nintendo)
plt.xticks(rotation=90)
plt.title("Yearwise Global Sales of Nintendo")
plt.show()
```



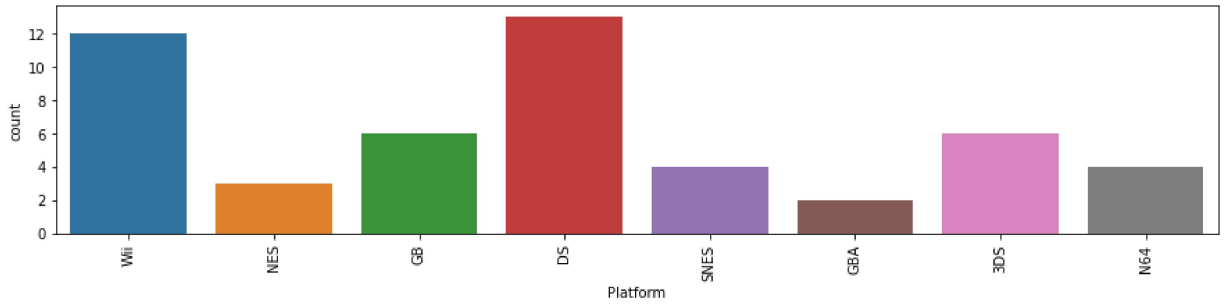

# Platforms of the publisher Nintendo

In [74]:
```
data[data['Publisher']=='Nintendo']["Platform"].value_counts()
```

Out[74]:
```
DS      13
Wii     12
3DS      6
GB       6
N64      4
SNES     4
NES      3
GBA      2
Name: Platform, dtype: int64
```

In [75]:
```
plt.figure(figsize=(15,3))
sns.countplot(data_nintendo["Platform"])
plt.xticks(rotation=90)
```

Out[75]:
```
(array([0, 1, 2, 3, 4, 5, 6, 7]),
 [Text(0, 0, 'Wii'),
  Text(1, 0, 'NES'),
  Text(2, 0, 'GB'),
  Text(3, 0, 'DS'),
  Text(4, 0, 'SNES'),
  Text(5, 0, 'GBA'),
  Text(6, 0, '3DS'),
  Text(7, 0, 'N64')])
```




# Total sales of publisher Nintendo

In [76]:
```
data[data['Publisher']=='Nintendo']['Global_Sales'].sum()
```

Out[76]:
```
905.3700000000001
```

# Extracting Data for The Publisher- Nintendo

In [77]:
```
d_nintendo=data[data['Publisher']=='Nintendo']
d_nintendo
```

Out[77]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 |
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 |
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 |
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6.50 |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2.93 |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4.70 |
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 |
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4.13 |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7.20 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3.54 |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4.16 |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6.04 |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4.18 |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3.84 |
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5.38 |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5.65 |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5.32 |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3.12 |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4.34 |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **39** | 40 | Super Smash Bros. Brawl | Wii | 2008 | Fighting | Nintendo | 6.75 | 2.61 | 2.66 |
| **41** | 42 | Animal Crossing: Wild World | DS | 2005 | Simulation | Nintendo | 2.55 | 3.52 | 5.33 |
| **42** | 43 | Mario Kart 7 | 3DS | 2011 | Racing | Nintendo | 4.74 | 3.91 | 2.67 |
| **45** | 46 | Pokemon HeartGold/Pokemon SoulSilver | DS | 2009 | Action | Nintendo | 4.40 | 2.77 | 3.96 |
| **46** | 47 | Super Mario 64 | N64 | 1996 | Platform | Nintendo | 6.91 | 2.85 | 1.91 |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 |
| **49** | 50 | Pokemon Omega Ruby/Pokemon Alpha Sapphire | 3DS | 2014 | Role-Playing | Nintendo | 4.23 | 3.37 | 3.08 |
| **50** | 51 | Super Mario Land 2: 6 Golden Coins | GB | 1992 | Adventure | Nintendo | 6.16 | 2.04 | 2.69 |
| **53** | 54 | Super Mario 3D Land | 3DS | 2011 | Platform | Nintendo | 4.89 | 2.99 | 2.13 |
| **57** | 58 | Super Mario All-Stars | SNES | 1993 | Platform | Nintendo | 5.99 | 2.15 | 2.12 |
| **58** | 59 | Pokemon FireRed/Pokemon LeafGreen | GBA | 2004 | Role-Playing | Nintendo | 4.34 | 2.65 | 3.15 |
| **59** | 60 | Super Mario 64 | DS | 2004 | Platform | Nintendo | 5.08 | 3.11 | 1.25 |
| **63** | 64 | Mario Kart 64 | N64 | 1996 | Racing | Nintendo | 5.55 | 1.94 | 2.23 |
| **64** | 65 | New Super Mario Bros. 2 | 3DS | 2012 | Platform | Nintendo | 3.66 | 3.07 | 2.47 |
| **71** | 72 | Donkey Kong Country | SNES | 1994 | Platform | Nintendo | 4.36 | 1.71 | 3.00 |
| **73** | 74 | Animal Crossing: New Leaf | 3DS | 2012 | Simulation | Nintendo | 2.01 | 2.32 | 4.36 |
| **74** | 75 | Mario Party DS | DS | 2007 | Misc | Nintendo | 4.46 | 1.88 | 1.98 |
| **76** | 77 | Super Mario Kart | SNES | 1992 | Racing | Nintendo | 3.54 | 1.24 | 3.81 |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2.49 |
| **80** | 81 | Mario Party 8 | Wii | 2007 | Misc | Nintendo | 3.81 | 2.30 | 1.58 |
| **81** | 82 | Pokemon Black 2/Pokemon White 2 | DS | 2012 | Role-Playing | Nintendo | 2.91 | 1.86 | 3.14 |
| **84** | 85 | GoldenEye 007 | N64 | 1997 | Shooter | Nintendo | 5.80 | 2.01 | 0.13 |
| **88** | 89 | PokÃ©mon Platinum Version | DS | 2008 | Role-Playing | Nintendo | 2.82 | 1.78 | 2.69 |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 |

# Nintendo Global Sales mean from 1984 to 2015

In [78]:
```
data[data['Publisher']=='Nintendo']['Global_Sales'].mean()
```

Out[78]:
```
18.1074
```

# List of Platforms

In [79]:
```
data['Platform'].unique()
```

Out[79]:
```
array(['Wii', 'NES', 'GB', 'DS', 'X360', 'PS3', 'PS2', 'SNES', 'GBA',
       '3DS', 'PS4', 'N64', 'PS', 'XB', 'PC', 2600, 'PSP'], dtype=object)
```

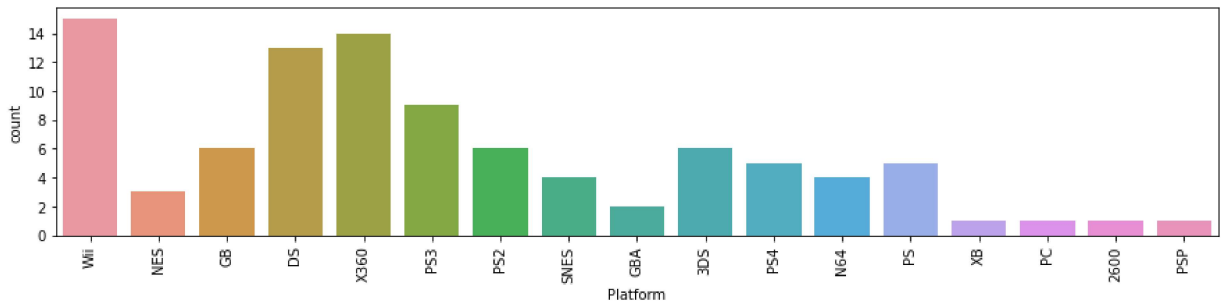
# To show the platform which has most number of video games published

In [80]:
```
data['Platform'].value_counts()
```

Out[80]:
```
Wii     15
X360    14
DS      13
PS3      9
PS2      6
GB       6
3DS      6
PS4      5
PS       5
SNES     4
N64      4
NES      3
GBA      2
PC       1
XB       1
2600     1
PSP      1
Name: Platform, dtype: int64
```

In [81]:
```
plt.figure(figsize=(15,3))
sns.countplot(data["Platform"])
plt.xticks(rotation=90)
```

Out[81]:
```
(array([ 0,  1,  2,  3,  4,  5,  6,  7,  8,  9, 10, 11, 12, 13, 14, 15, 16]),
 [Text(0, 0, 'Wii'),
  Text(1, 0, 'NES'),
  Text(2, 0, 'GB'),
  Text(3, 0, 'DS'),
  Text(4, 0, 'X360'),
  Text(5, 0, 'PS3'),
  Text(6, 0, 'PS2'),
  Text(7, 0, 'SNES'),
  Text(8, 0, 'GBA'),
  Text(9, 0, '3DS'),
  Text(10, 0, 'PS4'),
  Text(11, 0, 'N64'),
  Text(12, 0, 'PS'),
  Text(13, 0, 'XB'),
  Text(14, 0, 'PC'),
  Text(15, 0, '2600'),
  Text(16, 0, 'PSP')])
```




# Informations of Wii platforms

In [82]:
```
wii_data=data[data['Platform']=='Wii']
wii_data
```

Out[82]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | 8.4 |
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | 3.3 |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | 2.9 |
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2.93 | 2.8 |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4.70 | 2.2 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 | 2.1 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 | 1.7 |
| **39** | 40 | Super Smash Bros. Brawl | Wii | 2008 | Fighting | Nintendo | 6.75 | 2.61 | 2.66 | 1.0 |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 | 0.7 |
| **60** | 61 | Just Dance 3 | Wii | 2011 | Misc | Ubisoft | 6.05 | 3.15 | 0.00 | 1.0 |
| **68** | 69 | Just Dance 2 | Wii | 2010 | Misc | Ubisoft | 5.84 | 2.89 | 0.01 | 0.7 |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2.49 | 0.6 |
| **80** | 81 | Mario Party 8 | Wii | 2007 | Misc | Nintendo | 3.81 | 2.30 | 1.58 | 0.7 |
| **85** | 86 | Mario & Sonic at the Olympic Games | Wii | 2007 | Sports | Sega | 2.58 | 3.90 | 0.66 | 0.9 |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | 0.6 |

# List of Wii

In [83]:
```
wii_data['Name'].unique()
```

Out[83]:
```
array(['Wii Sports', 'Mario Kart Wii', 'Wii Sports Resort', 'Wii Play',
       'New Super Mario Bros. Wii', 'Wii Fit', 'Wii Fit Plus',
       'Super Smash Bros. Brawl', 'Super Mario Galaxy', 'Just Dance 3',
       'Just Dance 2', 'Wii Party', 'Mario Party 8',
       'Mario & Sonic at the Olympic Games', 'Super Mario Galaxy 2'],
      dtype=object)
```

# Genre in Wii platform

In [84]:
```
wii_data['Genre'].unique()
```

Out[84]:
```
array(['Sports', 'Racing', 'Misc', 'Platform', 'Fighting'], dtype=object)
```

# To show the frequency of Genre in Wii platform

In [85]:
```
wii_data['Genre'].value_counts()
```

Out[85]:
```
Sports      5
Misc        5
Platform    3
Fighting    1
Racing      1
Name: Genre, dtype: int64
```

# To show years which has most number of video games published

In [86]:
```
data['Year'].value_counts()
```

Out[86]:
```
2010    9
2012    7
2009    7
2007    7
2013    6
2011    6
2005    6
2004    5
2008    5
1997    4
2006    4
2001    3
2014    3
2015    3
1999    3
1996    3
2002    2
1998    2
1992    2
1989    2
1984    1
1994    1
1993    1
1990    1
1988    1
1985    1
1982    1
Name: Year, dtype: int64
```

# Informations of the year 2010

In [87]:
```
data[data['Year']==2010]
```

Out[87]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | C |
|---|---|---|---|---|---|---|---|---|---|---|
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0.24 | |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5.65 | |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0.48 | |
| **54** | 55 | Gran Turismo 5 | PS3 | 2010 | Racing | Sony Computer Entertainment | 2.96 | 4.88 | 0.81 | |
| **62** | 63 | Halo: Reach | X360 | 2010 | Shooter | Microsoft Game Studios | 7.03 | 1.98 | 0.08 | |
| **68** | 69 | Just Dance 2 | Wii | 2010 | Misc | Ubisoft | 5.84 | 2.89 | 0.01 | |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2.49 | |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |

# List of Genres

In [88]:
```
data['Genre'].unique()
```

Out[88]:
```
array(['Sports', 'Platform', 'Racing', 'Role-Playing', 'Puzzle', 'Misc',
       'Shooter', 'Simulation', 'Action', 'Fighting', 'Adventure'],
      dtype=object)
```

# Sort values based on genre and rank

In [89]:
```
data_sorted=data.sort_values(['Genre','Rank'])
data_sorted
```

Out[89]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0.97 | 4.14 |
| **17** | 18 | Grand Theft Auto: San Andreas | PS2 | 2004 | Action | Take-Two Interactive | 9.43 | 0.40 | 0.41 | 10.57 |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0.06 | 1.38 |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0.47 | 1.78 |
| **38** | 39 | Grand Theft Auto III | PS2 | 2001 | Action | Take-Two Interactive | 6.99 | 4.51 | 0.30 | 1.30 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | 2.96 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 | 2.15 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 | 1.79 |
| **77** | 78 | FIFA 16 | PS4 | 2015 | Sports | Electronic Arts | 1.11 | 6.06 | 0.06 | 1.26 |
| **85** | 86 | Mario & Sonic at the Olympic Games | Wii | 2007 | Sports | Sega | 2.58 | 3.90 | 0.66 | 0.91 |

96 rows × 11 columns

# Grouped by genre and rank

In [90]:
```
genre_data=data.groupby(['Genre','Rank']).sum()
genre_data
```

Out[90]:

| Genre | Rank | Year | NA_Sales | EU_Sales | JP_Sales | Other_Sales | Global_Sales |
|---|---|---|---|---|---|---|---|
| **Action** | **17** | 2013 | 7.01 | 9.27 | 0.97 | 4.14 | 21.40 |
| | **18** | 2004 | 9.43 | 0.40 | 0.41 | 10.57 | 20.81 |
| | **24** | 2013 | 9.63 | 5.31 | 0.06 | 1.38 | 16.38 |
| | **25** | 2002 | 8.41 | 5.49 | 0.47 | 1.78 | 16.15 |
| | **39** | 2001 | 6.99 | 4.51 | 0.30 | 1.30 | 13.10 |
| **...** | **...** | ... | ... | ... | ... | ... | ... |
| **Sports** | **4** | 2009 | 15.75 | 11.01 | 3.28 | 2.96 | 33.00 |
| | **14** | 2007 | 8.94 | 8.03 | 3.60 | 2.15 | 22.72 |
| | **15** | 2009 | 9.09 | 8.59 | 2.53 | 1.79 | 22.00 |
| | **78** | 2015 | 1.11 | 6.06 | 0.06 | 1.26 | 8.49 |
| | **86** | 2007 | 2.58 | 3.90 | 0.66 | 0.91 | 8.06 |

96 rows × 6 columns

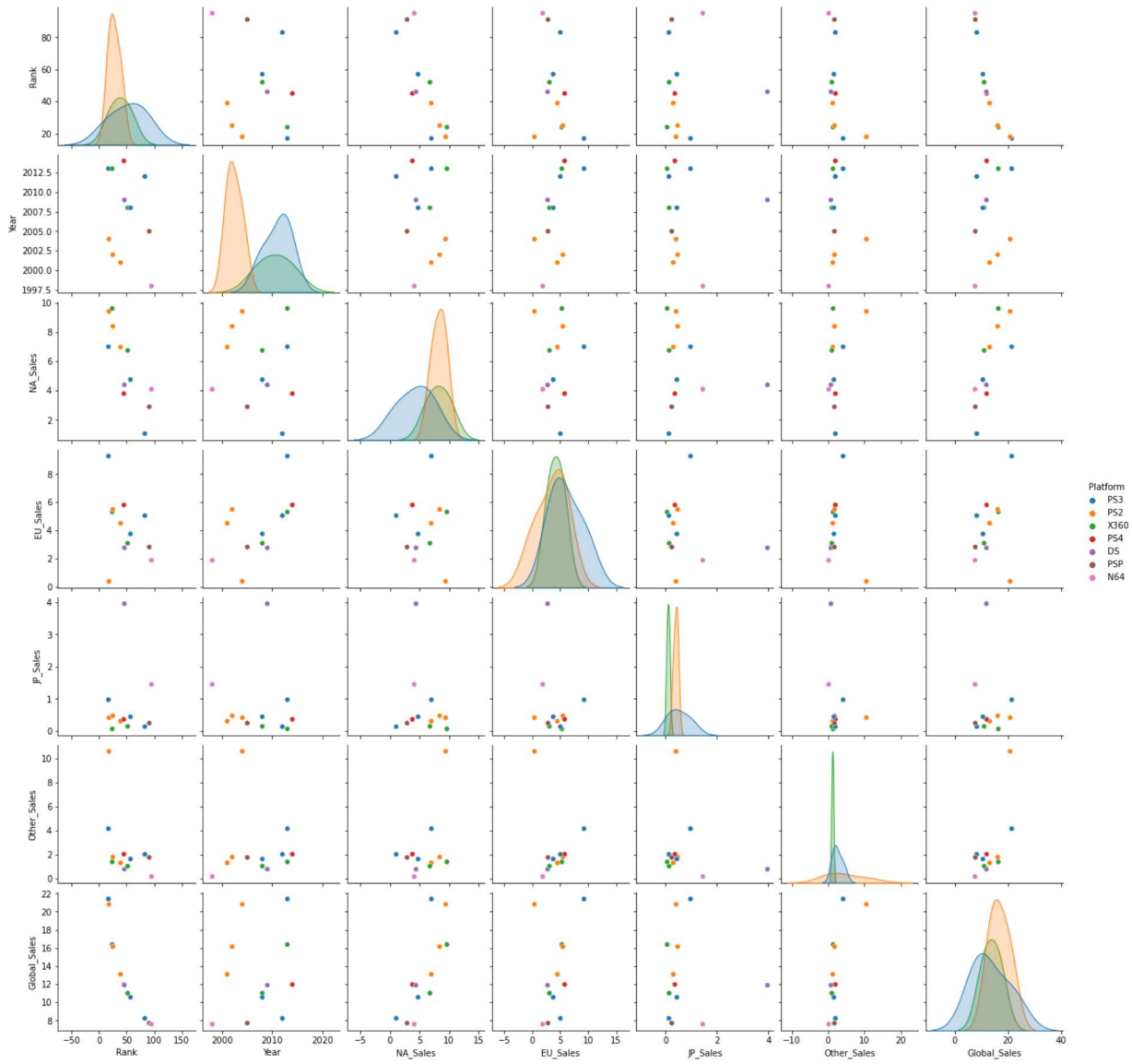
# Action video games details

In [91]:
```
actiondata=data[data['Genre']=='Action']
actiondata
```

Out[91]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | O |
|---|---|---|---|---|---|---|---|---|---|---|
| **16** | 17 | Grand Theft Auto V | PS3 | 2013 | Action | Take-Two Interactive | 7.01 | 9.27 | 0.97 | |
| **17** | 18 | Grand Theft Auto: San Andreas | PS2 | 2004 | Action | Take-Two Interactive | 9.43 | 0.40 | 0.41 | |
| **23** | 24 | Grand Theft Auto V | X360 | 2013 | Action | Take-Two Interactive | 9.63 | 5.31 | 0.06 | |
| **24** | 25 | Grand Theft Auto: Vice City | PS2 | 2002 | Action | Take-Two Interactive | 8.41 | 5.49 | 0.47 | |
| **38** | 39 | Grand Theft Auto III | PS2 | 2001 | Action | Take-Two Interactive | 6.99 | 4.51 | 0.30 | |
| **44** | 45 | Grand Theft Auto V | PS4 | 2014 | Action | Take-Two Interactive | 3.80 | 5.81 | 0.36 | |
| **45** | 46 | Pokemon HeartGold/Pokemon SoulSilver | DS | 2009 | Action | Nintendo | 4.40 | 2.77 | 3.96 | |
| **51** | 52 | Grand Theft Auto IV | X360 | 2008 | Action | Take-Two Interactive | 6.76 | 3.10 | 0.14 | |
| **56** | 57 | Grand Theft Auto IV | PS3 | 2008 | Action | Take-Two Interactive | 4.76 | 3.76 | 0.44 | |
| **82** | 83 | FIFA Soccer 13 | PS3 | 2012 | Action | Electronic Arts | 1.06 | 5.05 | 0.13 | |
| **90** | 91 | Grand Theft Auto: Liberty City Stories | PSP | 2005 | Action | Take-Two Interactive | 2.90 | 2.83 | 0.24 | |
| **94** | 95 | The Legend of Zelda: Ocarina of Time | N64 | 1998 | Action | Nintendo | 4.10 | 1.89 | 1.45 | |

In [92]:
```
sns.pairplot(actiondata,diag_kind='kde',hue='Platform')
plt.show()
```



# Publishers of Action games

In [93]:
```
actiondata['Publisher'].unique()
```

Out[93]:
```
array(['Take-Two Interactive', 'Nintendo', 'Electronic Arts'],
      dtype=object)
```

# Action game names and Platform

In [94]:
```
actiondata[['Name','Platform']]
```

Out[94]:

| | Name | Platform |
|---|---|---|
| **16** | Grand Theft Auto V | PS3 |
| **17** | Grand Theft Auto: San Andreas | PS2 |
| **23** | Grand Theft Auto V | X360 |
| **24** | Grand Theft Auto: Vice City | PS2 |
| **38** | Grand Theft Auto III | PS2 |
| **44** | Grand Theft Auto V | PS4 |
| **45** | Pokemon HeartGold/Pokemon SoulSilver | DS |
| **51** | Grand Theft Auto IV | X360 |
| **56** | Grand Theft Auto IV | PS3 |
| **82** | FIFA Soccer 13 | PS3 |
| **90** | Grand Theft Auto: Liberty City Stories | PSP |
| **94** | The Legend of Zelda: Ocarina of Time | N64 |

In [95]:
```
actiondata['Platform'].unique()
```

Out[95]:
```
array(['PS3', 'PS2', 'X360', 'PS4', 'DS', 'PSP', 'N64'], dtype=object)
```

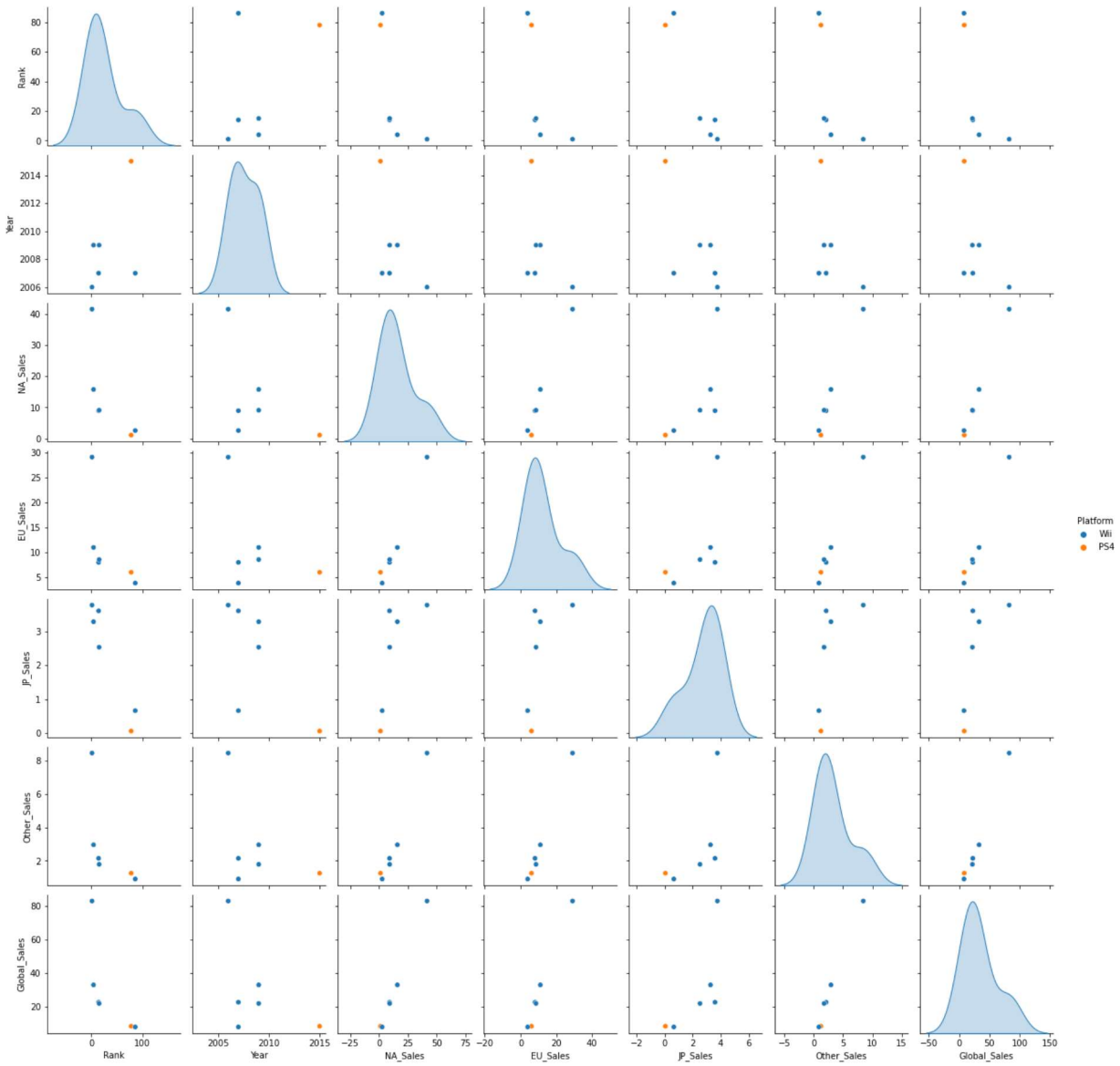
# Sports videogames details

In [96]:
```
sportsdata=data[data['Genre']=='Sports']
sportsdata
```

Out[96]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | 8.46 |
| **3** | 4 | Wii Sports Resort | Wii | 2009 | Sports | Nintendo | 15.75 | 11.01 | 3.28 | 2.96 |
| **13** | 14 | Wii Fit | Wii | 2007 | Sports | Nintendo | 8.94 | 8.03 | 3.60 | 2.15 |
| **14** | 15 | Wii Fit Plus | Wii | 2009 | Sports | Nintendo | 9.09 | 8.59 | 2.53 | 1.79 |
| **77** | 78 | FIFA 16 | PS4 | 2015 | Sports | Electronic Arts | 1.11 | 6.06 | 0.06 | 1.26 |
| **85** | 86 | Mario & Sonic at the Olympic Games | Wii | 2007 | Sports | Sega | 2.58 | 3.90 | 0.66 | 0.91 |

In [97]:
```
sns.pairplot(sportsdata,diag_kind='kde',hue='Platform')
plt.show()
```



## Publishers of sports games

In [98]:
```
sportsdata['Publisher'].unique()
```

Out[98]:
```
array(['Nintendo', 'Electronic Arts', 'Sega'], dtype=object)
```

## Sports games name and platforms

In [99]:
```
sportsdata[['Name','Platform']]
```

Out[99]:

| | Name | Platform |
|---|---|---|
| **0** | Wii Sports | Wii |
| **3** | Wii Sports Resort | Wii |
| **13** | Wii Fit | Wii |
| **14** | Wii Fit Plus | Wii |
| **77** | FIFA 16 | PS4 |
| **85** | Mario & Sonic at the Olympic Games | Wii |

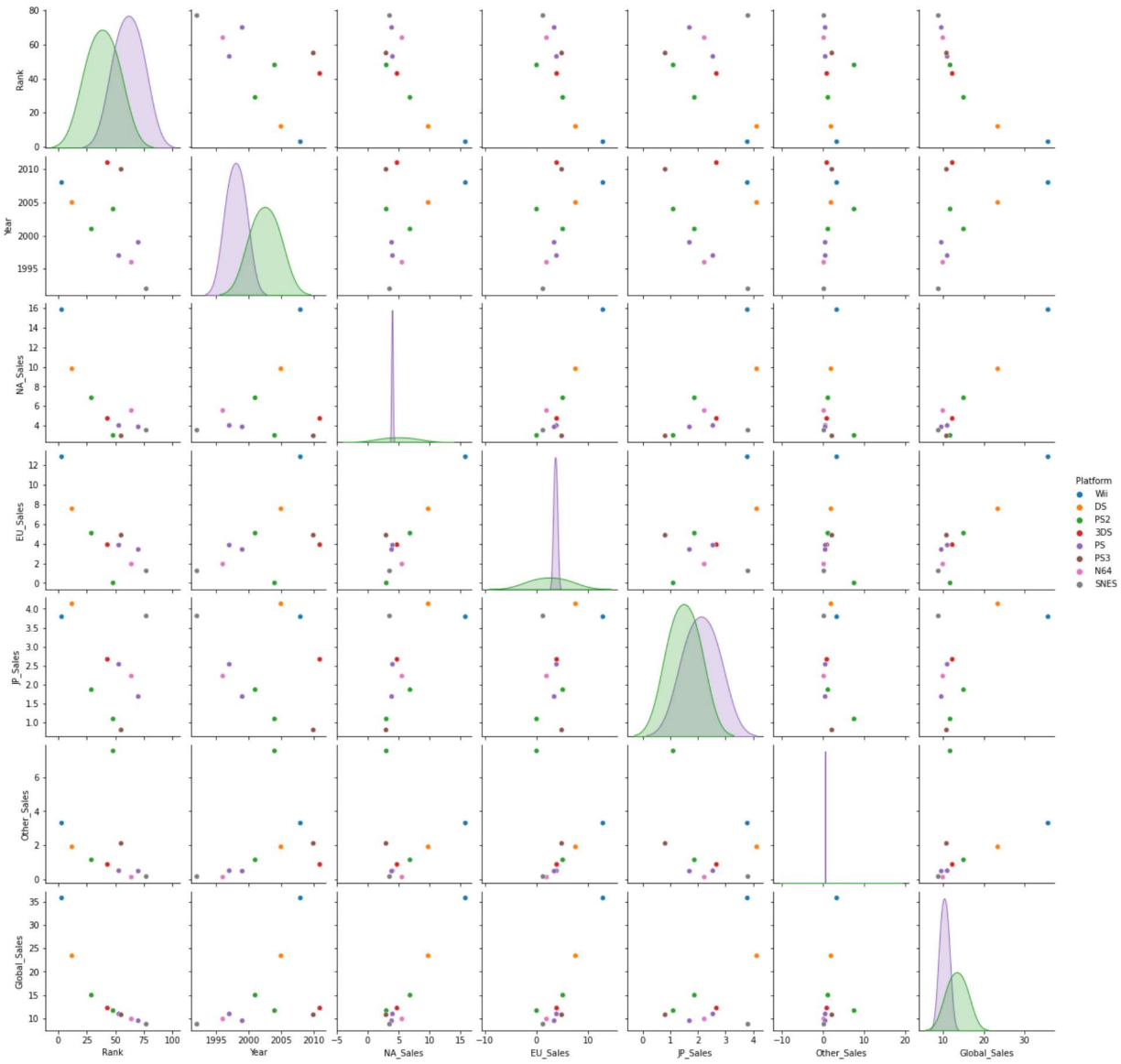
# Racing video game details

In [100]:
```
racingdata=data[data['Genre']=='Racing']
racingdata
```

Out[100]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sa |
|---|---|---|---|---|---|---|---|---|---|---|
| **2** | 3 | Mario Kart Wii | Wii | 2008 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | 3 |
| **11** | 12 | Mario Kart DS | DS | 2005 | Racing | Nintendo | 9.81 | 7.57 | 4.13 | 1 |
| **28** | 29 | Gran Turismo 3: A-Spec | PS2 | 2001 | Racing | Sony Computer Entertainment | 6.85 | 5.09 | 1.87 | 1 |
| **42** | 43 | Mario Kart 7 | 3DS | 2011 | Racing | Nintendo | 4.74 | 3.91 | 2.67 | 0 |
| **47** | 48 | Gran Turismo 4 | PS2 | 2004 | Racing | Sony Computer Entertainment | 3.01 | 0.01 | 1.10 | 7 |
| **52** | 53 | Gran Turismo | PS | 1997 | Racing | Sony Computer Entertainment | 4.02 | 3.87 | 2.54 | 0 |
| **54** | 55 | Gran Turismo 5 | PS3 | 2010 | Racing | Sony Computer Entertainment | 2.96 | 4.88 | 0.81 | 2 |
| **63** | 64 | Mario Kart 64 | N64 | 1996 | Racing | Nintendo | 5.55 | 1.94 | 2.23 | 0 |
| **69** | 70 | Gran Turismo 2 | PS | 1999 | Racing | Sony Computer Entertainment | 3.88 | 3.42 | 1.69 | 0 |
| **76** | 77 | Super Mario Kart | SNES | 1992 | Racing | Nintendo | 3.54 | 1.24 | 3.81 | 0 |

In [102]:
```
sns.pairplot(racingdata,diag_kind='kde',hue='Platform')
plt.show()
```




# Publishers of racing games

In [103]:
```
racingdata['Publisher'].unique()
```

Out[103]:
```
array(['Nintendo', 'Sony Computer Entertainment'], dtype=object)
```

## Racing game names and platforms

In [104]:
```
racingdata[['Name','Platform']]
```

Out[104]:

| | Name | Platform |
|---|---|---|
| **2** | Mario Kart Wii | Wii |
| **11** | Mario Kart DS | DS |
| **28** | Gran Turismo 3: A-Spec | PS2 |
| **42** | Mario Kart 7 | 3DS |
| **47** | Gran Turismo 4 | PS2 |
| **52** | Gran Turismo | PS |
| **54** | Gran Turismo 5 | PS3 |
| **63** | Mario Kart 64 | N64 |
| **69** | Gran Turismo 2 | PS |
| **76** | Super Mario Kart | SNES |

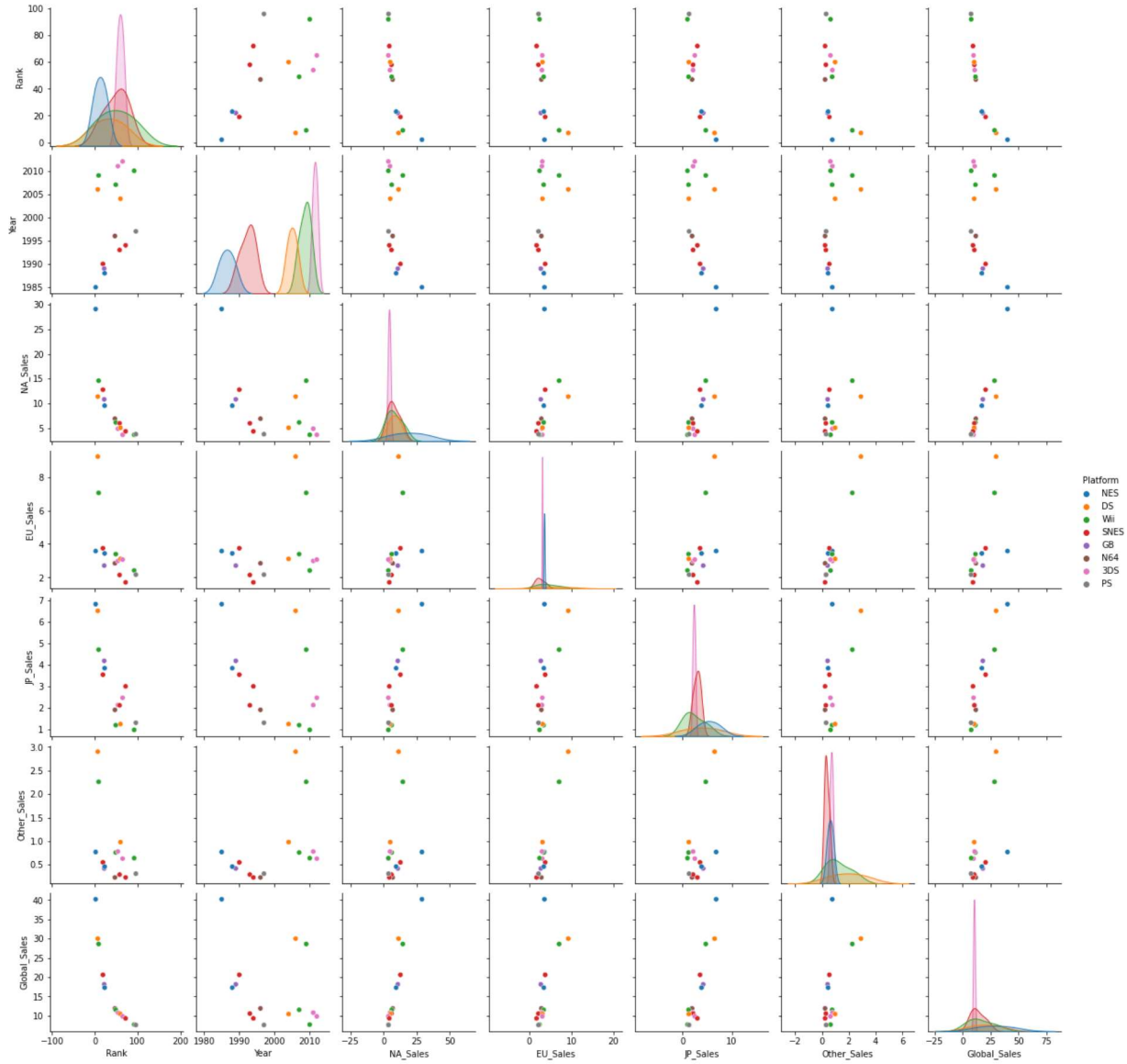
# Platform videogames details

In [105]:
```
platform_data=data[data['Genre']=='Platform']
platform_data
```

Out[105]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 2 | Super Mario Bros. | NES | 1985 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **6** | 7 | New Super Mario Bros. | DS | 2006 | Platform | Nintendo | 11.38 | 9.23 | 6.50 | |
| **8** | 9 | New Super Mario Bros. Wii | Wii | 2009 | Platform | Nintendo | 14.59 | 7.06 | 4.70 | |
| **18** | 19 | Super Mario World | SNES | 1990 | Platform | Nintendo | 12.78 | 3.75 | 3.54 | |
| **21** | 22 | Super Mario Land | GB | 1989 | Platform | Nintendo | 10.83 | 2.71 | 4.18 | |
| **22** | 23 | Super Mario Bros. 3 | NES | 1988 | Platform | Nintendo | 9.54 | 3.44 | 3.84 | |
| **46** | 47 | Super Mario 64 | N64 | 1996 | Platform | Nintendo | 6.91 | 2.85 | 1.91 | |
| **48** | 49 | Super Mario Galaxy | Wii | 2007 | Platform | Nintendo | 6.16 | 3.40 | 1.20 | |
| **53** | 54 | Super Mario 3D Land | 3DS | 2011 | Platform | Nintendo | 4.89 | 2.99 | 2.13 | |
| **57** | 58 | Super Mario All-Stars | SNES | 1993 | Platform | Nintendo | 5.99 | 2.15 | 2.12 | |
| **59** | 60 | Super Mario 64 | DS | 2004 | Platform | Nintendo | 5.08 | 3.11 | 1.25 | |
| **64** | 65 | New Super Mario Bros. 2 | 3DS | 2012 | Platform | Nintendo | 3.66 | 3.07 | 2.47 | |
| **71** | 72 | Donkey Kong Country | SNES | 1994 | Platform | Nintendo | 4.36 | 1.71 | 3.00 | |
| **91** | 92 | Super Mario Galaxy 2 | Wii | 2010 | Platform | Nintendo | 3.66 | 2.42 | 0.98 | |
| **95** | 96 | Crash Bandicoot 2: Cortex Strikes Back | PS | 1997 | Platform | Sony Computer Entertainment | 3.78 | 2.17 | 1.31 | |

In [106]:
```
sns.pairplot(platform_data,diag_kind='kde',hue='Platform')
plt.show()
```




# Publishers of platform games

In [107]:
```
platform_data['Publisher'].unique()
```

Out[107]:
```
array(['Nintendo', 'Sony Computer Entertainment'], dtype=object)
```

# Platform game names and platforms

In [108]:
```
platform_data[['Name','Platform']]
```

Out[108]:

| | Name | Platform |
|---|---|---|
| 1 | Super Mario Bros. | NES |
| 6 | New Super Mario Bros. | DS |
| 8 | New Super Mario Bros. Wii | Wii |
| 18 | Super Mario World | SNES |
| 21 | Super Mario Land | GB |
| 22 | Super Mario Bros. 3 | NES |
| 46 | Super Mario 64 | N64 |
| 48 | Super Mario Galaxy | Wii |
| 53 | Super Mario 3D Land | 3DS |
| 57 | Super Mario All-Stars | SNES |
| 59 | Super Mario 64 | DS |
| 64 | New Super Mario Bros. 2 | 3DS |
| 71 | Donkey Kong Country | SNES |
| 91 | Super Mario Galaxy 2 | Wii |
| 95 | Crash Bandicoot 2: Cortex Strikes Back | PS |

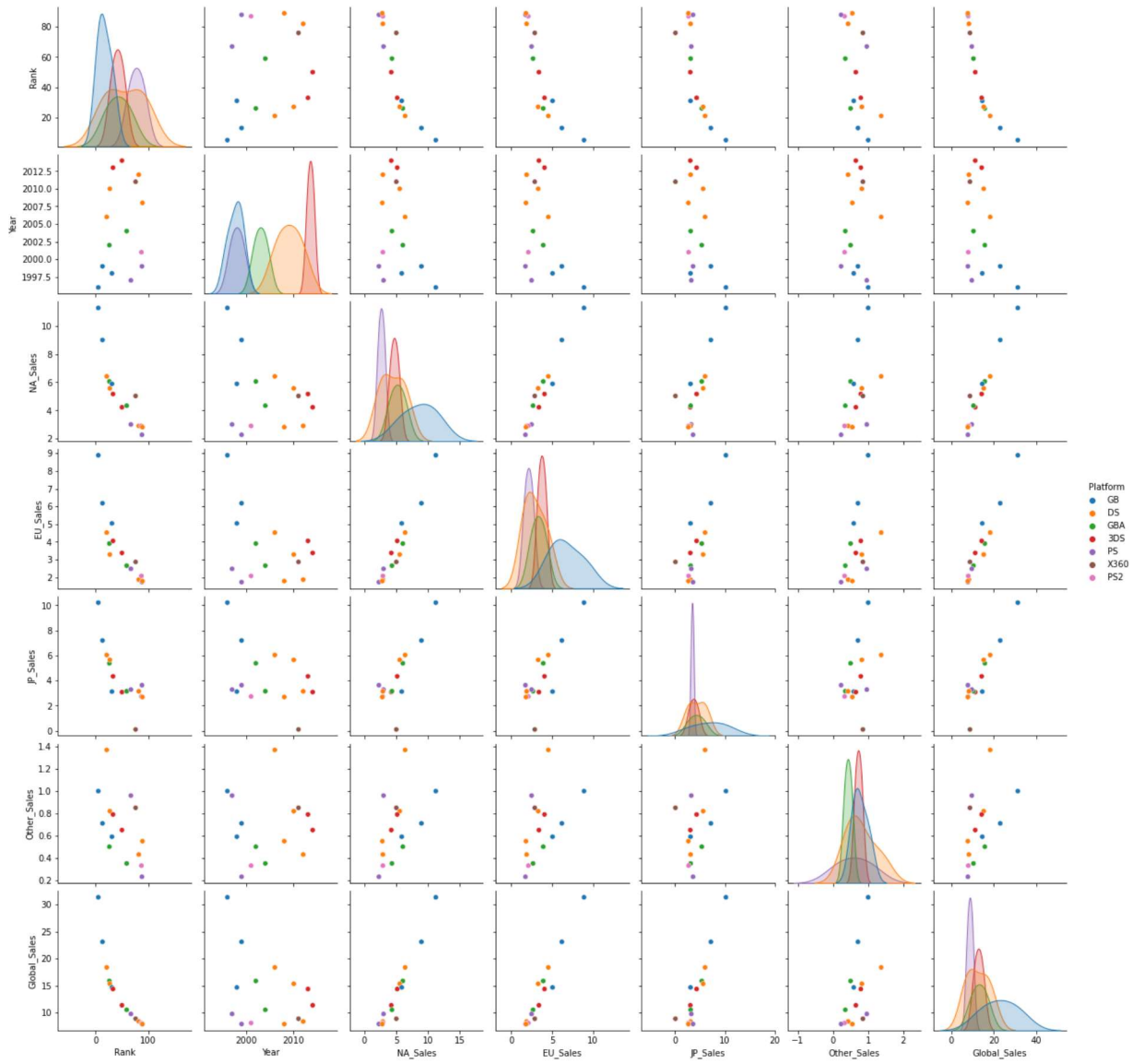
# Role-Playing video game details

In [109]:
```
rollplay_data=data[data['Genre']=='Role-Playing']
rollplay_data
```

Out[109]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales |
|---|---|---|---|---|---|---|---|---|---|
| **4** | 5 | Pokemon Red/Pokemon Blue | GB | 1996 | Role-Playing | Nintendo | 11.27 | 8.89 | 10.22 |
| **12** | 13 | Pokemon Gold/Pokemon Silver | GB | 1999 | Role-Playing | Nintendo | 9.00 | 6.18 | 7.20 |
| **20** | 21 | Pokemon Diamond/Pokemon Pearl | DS | 2006 | Role-Playing | Nintendo | 6.42 | 4.52 | 6.04 |
| **25** | 26 | Pokemon Ruby/Pokemon Sapphire | GBA | 2002 | Role-Playing | Nintendo | 6.06 | 3.90 | 5.38 |
| **26** | 27 | Pokemon Black/Pokemon White | DS | 2010 | Role-Playing | Nintendo | 5.57 | 3.28 | 5.65 |
| **30** | 31 | PokÃ©mon Yellow: Special Pikachu Edition | GB | 1998 | Role-Playing | Nintendo | 5.89 | 5.04 | 3.12 |
| **32** | 33 | Pokemon X/Pokemon Y | 3DS | 2013 | Role-Playing | Nintendo | 5.17 | 4.05 | 4.34 |
| **49** | 50 | Pokemon Omega Ruby/Pokemon Alpha Sapphire | 3DS | 2014 | Role-Playing | Nintendo | 4.23 | 3.37 | 3.08 |
| **58** | 59 | Pokemon FireRed/Pokemon LeafGreen | GBA | 2004 | Role-Playing | Nintendo | 4.34 | 2.65 | 3.15 |
| **66** | 67 | Final Fantasy VII | PS | 1997 | Role-Playing | Sony Computer Entertainment | 3.01 | 2.47 | 3.28 |
| **75** | 76 | The Elder Scrolls V: Skyrim | X360 | 2011 | Role-Playing | Bethesda Softworks | 5.03 | 2.86 | 0.10 |
| **81** | 82 | Pokemon Black 2/Pokemon White 2 | DS | 2012 | Role-Playing | Nintendo | 2.91 | 1.86 | 3.14 |
| **86** | 87 | Final Fantasy X | PS2 | 2001 | Role-Playing | Sony Computer Entertainment | 2.91 | 2.07 | 2.73 |
| **87** | 88 | Final Fantasy VIII | PS | 1999 | Role-Playing | SquareSoft | 2.28 | 1.72 | 3.63 |
| **88** | 89 | PokÃ©mon Platinum Version | DS | 2008 | Role-Playing | Nintendo | 2.82 | 1.78 | 2.69 |

In [110]:
```
sns.pairplot(rollplay_data,diag_kind='kde',hue='Platform')
plt.show()
```




# Publishers of role-playing games

In [111]:
```
rollplay_data['Publisher'].unique()
```

Out[111]:
```
array(['Nintendo', 'Sony Computer Entertainment', 'Bethesda Softworks',
       'SquareSoft'], dtype=object)
```

# Role-playing game names and platform

In [112]:
```
rollplay_data[['Name','Platform']]
```

Out[112]:

| | Name | Platform |
|---|---|---|
| **4** | Pokemon Red/Pokemon Blue | GB |
| **12** | Pokemon Gold/Pokemon Silver | GB |
| **20** | Pokemon Diamond/Pokemon Pearl | DS |
| **25** | Pokemon Ruby/Pokemon Sapphire | GBA |
| **26** | Pokemon Black/Pokemon White | DS |
| **30** | PokÃ©mon Yellow: Special Pikachu Edition | GB |
| **32** | Pokemon X/Pokemon Y | 3DS |
| **49** | Pokemon Omega Ruby/Pokemon Alpha Sapphire | 3DS |
| **58** | Pokemon FireRed/Pokemon LeafGreen | GBA |
| **66** | Final Fantasy VII | PS |
| **75** | The Elder Scrolls V: Skyrim | X360 |
| **81** | Pokemon Black 2/Pokemon White 2 | DS |
| **86** | Final Fantasy X | PS2 |
| **87** | Final Fantasy VIII | PS |
| **88** | PokÃ©mon Platinum Version | DS |

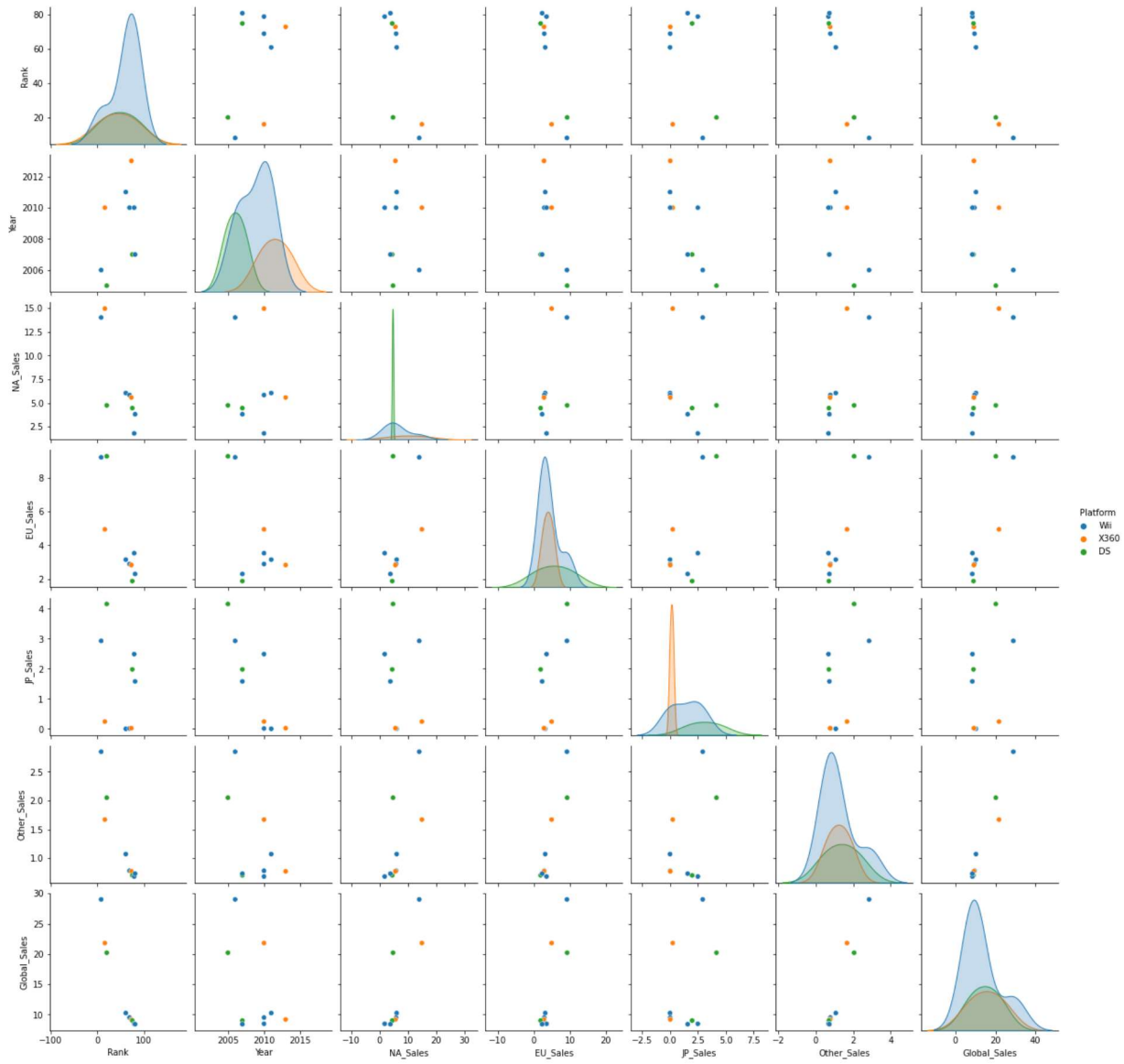
# Misc game details

In [113]:
```
misc_data=data[data['Genre']=='Misc']
misc_data
```

Out[113]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sa |
|---|---|---|---|---|---|---|---|---|---|---|
| **7** | 8 | Wii Play | Wii | 2006 | Misc | Nintendo | 14.03 | 9.20 | 2.93 | 2 |
| **15** | 16 | Kinect Adventures! | X360 | 2010 | Misc | Microsoft Game Studios | 14.97 | 4.94 | 0.24 | 1 |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4.16 | 2 |
| **60** | 61 | Just Dance 3 | Wii | 2011 | Misc | Ubisoft | 6.05 | 3.15 | 0.00 | 1 |
| **68** | 69 | Just Dance 2 | Wii | 2010 | Misc | Ubisoft | 5.84 | 2.89 | 0.01 | 0 |
| **72** | 73 | Minecraft | X360 | 2013 | Misc | Microsoft Game Studios | 5.58 | 2.83 | 0.02 | 0 |
| **74** | 75 | Mario Party DS | DS | 2007 | Misc | Nintendo | 4.46 | 1.88 | 1.98 | 0 |
| **78** | 79 | Wii Party | Wii | 2010 | Misc | Nintendo | 1.79 | 3.53 | 2.49 | 0 |
| **80** | 81 | Mario Party 8 | Wii | 2007 | Misc | Nintendo | 3.81 | 2.30 | 1.58 | 0 |

In [114]:
```
sns.pairplot(misc_data,diag_kind='kde',hue='Platform')
plt.show()
```



# Publishers of Misc games

In [115]:
```
misc_data['Publisher'].unique()
```

Out[115]:
```
array(['Nintendo', 'Microsoft Game Studios', 'Ubisoft'], dtype=object)
```

# Misc game names and platform

In [116]:
```
misc_data[['Name','Platform']]
```

Out[116]:

| | Name | Platform |
|---|---|---|
| **7** | Wii Play | Wii |
| **15** | Kinect Adventures! | X360 |
| **19** | Brain Age | DS |
| **60** | Just Dance 3 | Wii |
| **68** | Just Dance 2 | Wii |
| **72** | Minecraft | X360 |
| **74** | Mario Party DS | DS |
| **78** | Wii Party | Wii |
| **80** | Mario Party 8 | Wii |

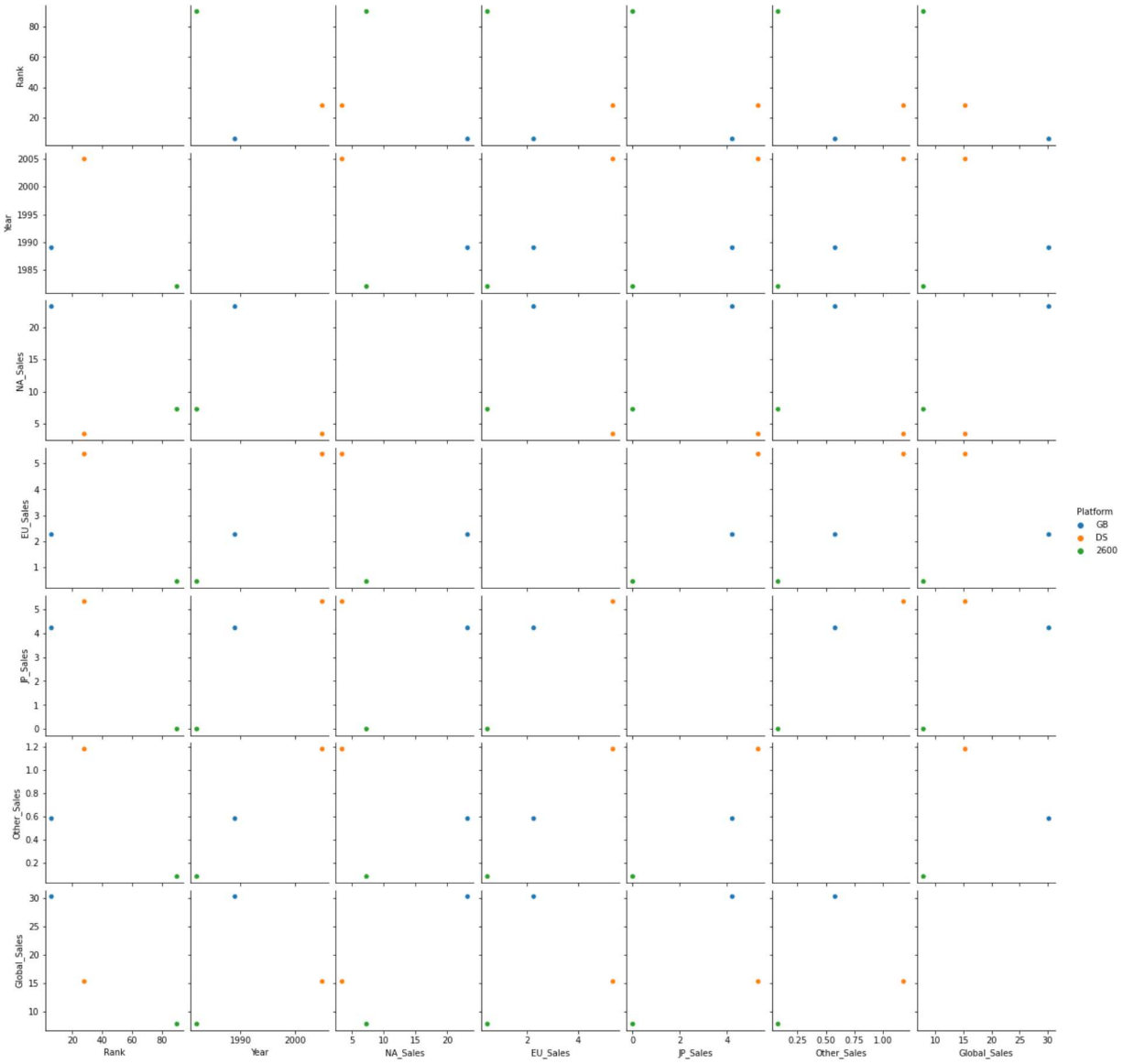
# Puzzle video game details

In [117]:
```
puzzle_data=data[data['Genre']=="Puzzle"]
puzzle_data
```

Out[117]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **5** | 6 | Tetris | GB | 1989 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 | 0.58 |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5.32 | 1.18 |
| **89** | 90 | Pac-Man | 2600 | 1982 | Puzzle | Atari | 7.28 | 0.45 | 0.00 | 0.08 |

In [118]:
```
sns.pairplot(puzzle_data,hue='Platform')
plt.show()
```




# Publishers of Puzzle games

In [119]:
```
puzzle_data['Publisher'].unique()
```

Out[119]:
```
array(['Nintendo', 'Atari'], dtype=object)
```

# Puzzle game names and platforms

In [120]:
```
puzzle_data[['Name','Platform']]
```

Out[120]:

| | Name | Platform |
|---|---|---|
| **5** | Tetris | GB |
| **27** | Brain Age 2: More Training in Minutes a Day | DS |
| **89** | Pac-Man | 2600 |

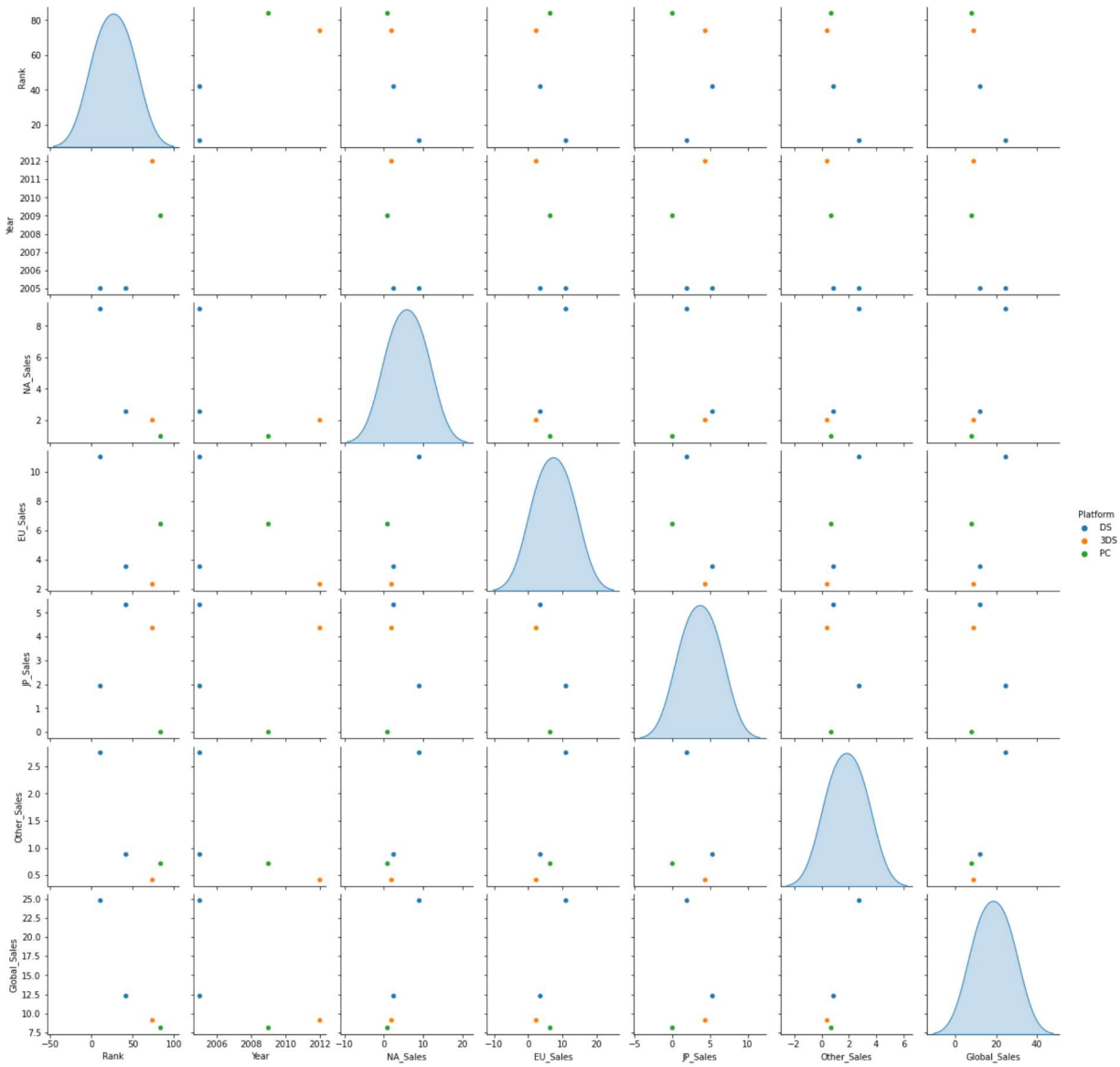
# Simulation video game details

In [121]:
```
simulation_data=data[data['Genre']=='Simulation']
simulation_data
```

Out[121]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_ |
|---|---|---|---|---|---|---|---|---|---|---|
| **10** | 11 | Nintendogs | DS | 2005 | Simulation | Nintendo | 9.07 | 11.00 | 1.93 | |
| **41** | 42 | Animal Crossing: Wild World | DS | 2005 | Simulation | Nintendo | 2.55 | 3.52 | 5.33 | |
| **73** | 74 | Animal Crossing: New Leaf | 3DS | 2012 | Simulation | Nintendo | 2.01 | 2.32 | 4.36 | |
| **83** | 84 | The Sims 3 | PC | 2009 | Simulation | Electronic Arts | 0.98 | 6.42 | 0.00 | |

In [122]:
```
sns.pairplot(simulation_data,diag_kind='kde',hue='Platform')
plt.show()
```



# Publishers of simulation games

In [123]:
```
simulation_data['Publisher'].unique()
```

Out[123]:
```
array(['Nintendo', 'Electronic Arts'], dtype=object)
```

# Simulation game names and platforms

In [124]:
```
simulation_data[['Name','Platform']]
```

Out[124]:

| | Name | Platform |
|---|---|---|
| **10** | Nintendogs | DS |
| **41** | Animal Crossing: Wild World | DS |
| **73** | Animal Crossing: New Leaf | 3DS |
| **83** | The Sims 3 | PC |

# Fighting video game details

In [125]:
```
fighting_data=data[data['Genre']=='Fighting']
fighting_data
```

Out[125]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sales |
|---|---|---|---|---|---|---|---|---|---|---|
| **39** | 40 | Super Smash Bros. Brawl | Wii | 2008 | Fighting | Nintendo | 6.75 | 2.61 | 2.66 | 1.02 |

# Publishers of Fighting games

In [126]:
```
fighting_data['Publisher'].unique()
```

Out[126]:
```
array(['Nintendo'], dtype=object)
```

# Fighting game names and platforms

In [127]:
```
fighting_data[['Name','Platform']]
```

Out[127]:

| | Name | Platform |
|---|---|---|
| **39** | Super Smash Bros. Brawl | Wii |

# Adventure video game details

In [128]:
```
adventure_data=data[data['Genre']=='Adventure']
adventure_data
```

Out[128]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sale |
|---|---|---|---|---|---|---|---|---|---|---|
| **50** | 51 | Super Mario Land 2: 6 Golden Coins | GB | 1992 | Adventure | Nintendo | 6.16 | 2.04 | 2.69 | 0.2 |

# Publishers of Adventure games

In [129]:
```
adventure_data['Publisher'].unique()
```

Out[129]:
```
array(['Nintendo'], dtype=object)
```

# Adventure game names and platforms

In [130]:
```
adventure_data[['Name','Platform']]
```

Out[130]:

| | Name | Platform |
|---|---|---|
| **50** | Super Mario Land 2: 6 Golden Coins | GB |

# Shooter video game details

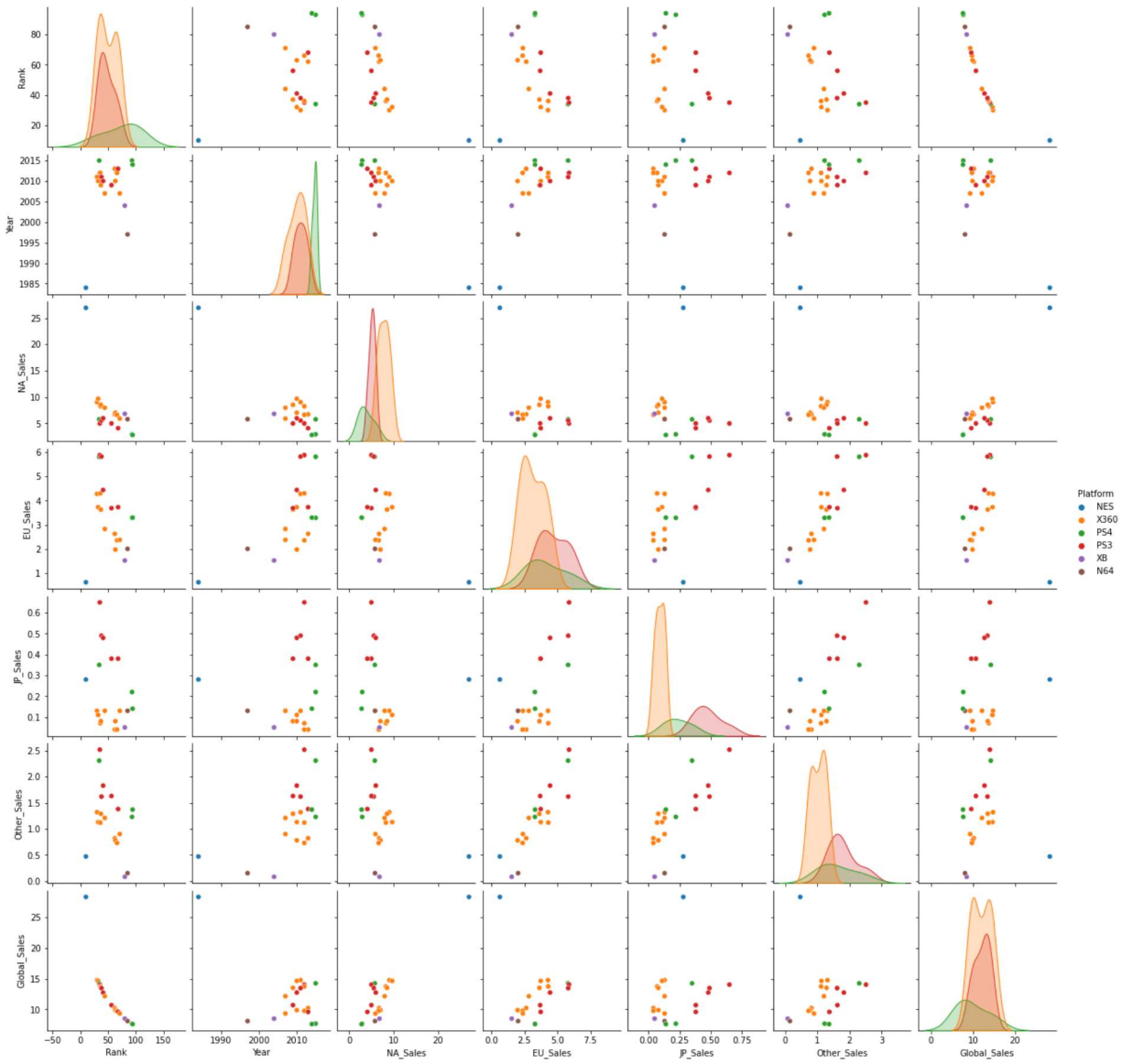
In [131]:
```
shooter_data=data[data['Genre']=='Shooter']
shooter_data
```

Out[131]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sa |
|---|---|---|---|---|---|---|---|---|---|---|
| **9** | 10 | Duck Hunt | NES | 1984 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 | 0 |
| **29** | 30 | Call of Duty: Modern Warfare 3 | X360 | 2011 | Shooter | Activision | 9.03 | 4.28 | 0.13 | 1 |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | 1 |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0.35 | 2 |
| **34** | 35 | Call of Duty: Black Ops II | PS3 | 2012 | Shooter | Activision | 4.99 | 5.88 | 0.65 | 2 |
| **35** | 36 | Call of Duty: Black Ops II | X360 | 2012 | Shooter | Activision | 8.25 | 4.30 | 0.07 | 1 |
| **36** | 37 | Call of Duty: Modern Warfare 2 | X360 | 2009 | Shooter | Activision | 8.52 | 3.63 | 0.08 | 1 |
| **37** | 38 | Call of Duty: Modern Warfare 3 | PS3 | 2011 | Shooter | Activision | 5.54 | 5.82 | 0.49 | 1 |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0.48 | 1 |
| **43** | 44 | Halo 3 | X360 | 2007 | Shooter | Microsoft Game Studios | 7.97 | 2.83 | 0.13 | 1 |
| **55** | 56 | Call of Duty: Modern Warfare 2 | PS3 | 2009 | Shooter | Activision | 4.99 | 3.69 | 0.38 | 1 |
| **61** | 62 | Call of Duty: Ghosts | X360 | 2013 | Shooter | Activision | 6.72 | 2.63 | 0.04 | 0 |
| **62** | 63 | Halo: Reach | X360 | 2010 | Shooter | Microsoft Game Studios | 7.03 | 1.98 | 0.08 | 0 |
| **65** | 66 | Halo 4 | X360 | 2012 | Shooter | Microsoft Game Studios | 6.63 | 2.36 | 0.04 | 0 |
| **67** | 68 | Call of Duty: Ghosts | PS3 | 2013 | Shooter | Activision | 4.09 | 3.73 | 0.38 | 1 |

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_Sa |
|---|---|---|---|---|---|---|---|---|---|---|
| **70** | 71 | Call of Duty 4: Modern Warfare | X360 | 2007 | Shooter | Activision | 5.91 | 2.38 | 0.13 | 0 |
| **79** | 80 | Halo 2 | XB | 2004 | Shooter | Microsoft Game Studios | 6.82 | 1.53 | 0.05 | 0 |
| **84** | 85 | GoldenEye 007 | N64 | 1997 | Shooter | Nintendo | 5.80 | 2.01 | 0.13 | 0 |
| **92** | 93 | Star Wars Battlefront (2015) | PS4 | 2015 | Shooter | Electronic Arts | 2.93 | 3.29 | 0.22 | 1 |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | 1 |

In [132]:
```
sns.pairplot(shooter_data,diag_kind='kde',hue='Platform')
plt.show()
```



# Publishers of Shooter games

In [133]:
```
shooter_data['Publisher'].unique()
```

Out[133]:
```
array(['Nintendo', 'Activision', 'Microsoft Game Studios',
       'Electronic Arts'], dtype=object)
```

# Shooter game names and platforms

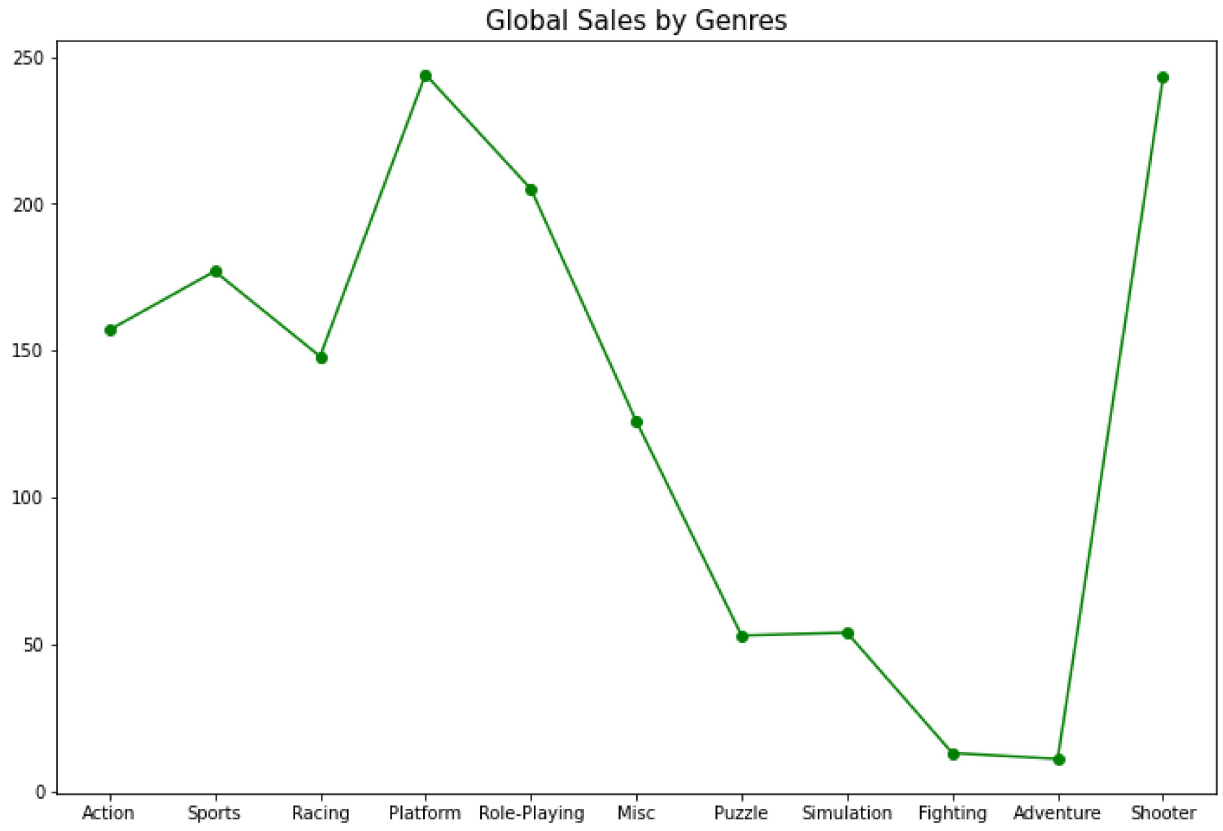
In [134]:
```
shooter_data[['Name','Platform']]
```

Out[134]:

| | Name | Platform |
|---|---|---|
| **9** | Duck Hunt | NES |
| **29** | Call of Duty: Modern Warfare 3 | X360 |
| **31** | Call of Duty: Black Ops | X360 |
| **33** | Call of Duty: Black Ops 3 | PS4 |
| **34** | Call of Duty: Black Ops II | PS3 |
| **35** | Call of Duty: Black Ops II | X360 |
| **36** | Call of Duty: Modern Warfare 2 | X360 |
| **37** | Call of Duty: Modern Warfare 3 | PS3 |
| **40** | Call of Duty: Black Ops | PS3 |
| **43** | Halo 3 | X360 |
| **55** | Call of Duty: Modern Warfare 2 | PS3 |
| **61** | Call of Duty: Ghosts | X360 |
| **62** | Halo: Reach | X360 |
| **65** | Halo 4 | X360 |
| **67** | Call of Duty: Ghosts | PS3 |
| **70** | Call of Duty 4: Modern Warfare | X360 |
| **79** | Halo 2 | XB |
| **84** | GoldenEye 007 | N64 |
| **92** | Star Wars Battlefront (2015) | PS4 |
| **93** | Call of Duty: Advanced Warfare | PS4 |

# Genres and Global Sales Plot

In [135]:
```
g1=actiondata['Global_Sales'].sum().round()
g2=sportsdata['Global_Sales'].sum().round()
g3=racingdata['Global_Sales'].sum().round()
g4=platform_data['Global_Sales'].sum().round()
g5=rollplay_data['Global_Sales'].sum().round()
g6=misc_data['Global_Sales'].sum().round()
g7=puzzle_data['Global_Sales'].sum().round()
g8=simulation_data['Global_Sales'].sum().round()
g9=fighting_data['Global_Sales'].sum().round()
g10=adventure_data['Global_Sales'].sum().round()
g11=shooter_data['Global_Sales'].sum().round()
games=[g1,g2,g3,g4,g5,g6,g7,g8,g9,g10,g11]
gnames=['Action','Sports','Racing','Platform','Role-Playing','Misc', 'Puzzle',
        'Simulation','Fighting', 'Adventure','Shooter']


plt.figure(figsize=(12,8))
plt.plot(gnames,games,marker='o',color='g')
plt.title("Global Sales by Genres",fontsize=15)
plt.show()
```



# Top Genres Plot

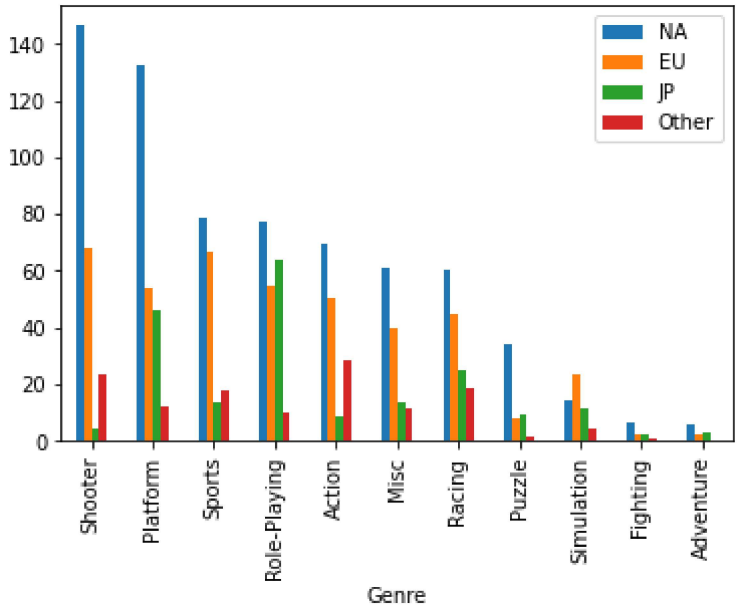
In [136]:
```
top_US = data[[ 'Name','Platform', 'Year', 'Genre', 'Publisher', 'NA_Sales']].sor

top_EU = data[[ 'Name','Platform', 'Year', 'Genre', 'Publisher', 'EU_Sales']].sor

top_JP = data[[ 'Name','Platform', 'Year', 'Genre', 'Publisher', 'JP_Sales']].sor

top_other = data[[ 'Name','Platform', 'Year', 'Genre', 'Publisher', 'Other_Sales'

top_Genres = top_US.groupby('Genre')['NA_Sales'].sum().to_frame(name = "NA").sort
top_EU_Genres = top_EU.groupby('Genre')['EU_Sales'].sum().to_frame(name = "EU").s
top_JP_Genres = top_JP.groupby('Genre')['JP_Sales'].sum().to_frame(name = "JP").s
top_other_Genres = top_other.groupby('Genre')['Other_Sales'].sum().to_frame(name


top_Genres['EU'] = top_EU_Genres
top_Genres['JP'] = top_JP_Genres
top_Genres['Other'] = top_other_Genres

top_Genres
```

Out[136]:

| Genre | NA | EU | JP | Other |
|---|---|---|---|---|
| **Shooter** | 146.37 | 68.25 | 4.36 | 23.89 |
| **Platform** | 132.69 | 53.64 | 45.94 | 12.21 |
| **Sports** | 78.96 | 66.61 | 13.90 | 17.53 |
| **Role-Playing** | 76.91 | 54.64 | 63.75 | 10.13 |
| **Action** | 69.25 | 50.19 | 8.93 | 28.53 |
| **Misc** | 61.28 | 39.98 | 13.41 | 11.30 |
| **Racing** | 60.21 | 44.81 | 24.64 | 18.28 |
| **Puzzle** | 33.92 | 8.07 | 9.54 | 1.84 |
| **Simulation** | 14.61 | 23.26 | 11.62 | 4.75 |
| **Fighting** | 6.75 | 2.61 | 2.66 | 1.02 |
| **Adventure** | 6.16 | 2.04 | 2.69 | 0.29 |

In [137]:
```
top_Genres.plot.bar()
```

Out[137]:
```
<AxesSubplot:xlabel='Genre'>
```




# Get all scalars

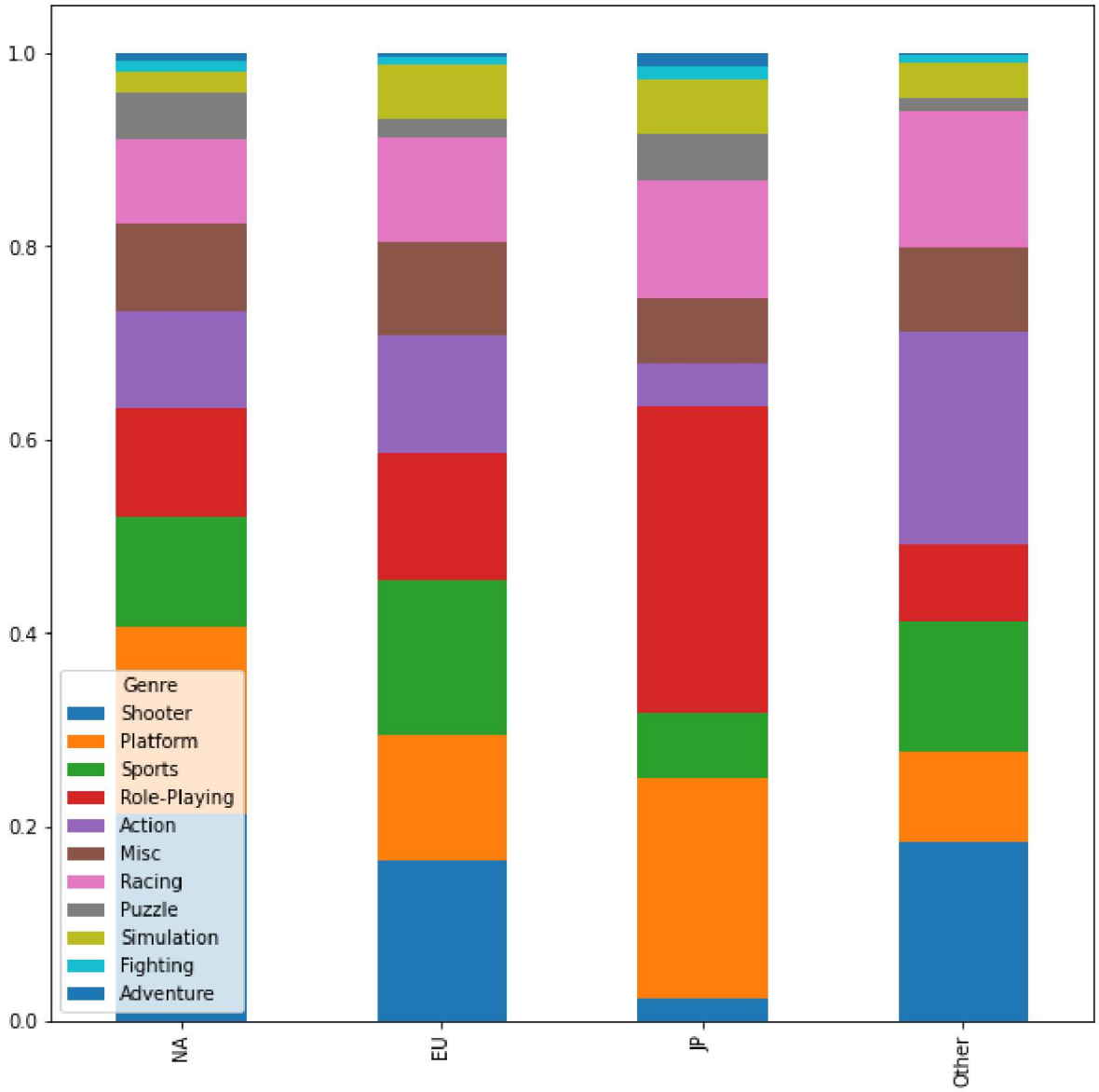
In [138]:
```
scale_NA = top_Genres['NA'].sum()
scale_EU = top_Genres['EU'].sum()
scale_JP = top_Genres['JP'].sum()
scale_other = top_Genres['Other'].sum()
stg = top_Genres["NA"].div(scale_NA)
scaledTG = stg.to_frame(name = "NA")
scaledTG['EU'] = top_Genres['EU'].div(scale_EU)
scaledTG['JP'] = top_Genres['JP'].div(scale_JP)
scaledTG['Other'] = top_Genres['Other'].div(scale_other)
scaledTG
```

Out[138]:

| Genre | NA | EU | JP | Other |
|---|---|---|---|---|
| **Shooter** | 0.213023 | 0.164815 | 0.021644 | 0.184095 |
| **Platform** | 0.193113 | 0.129534 | 0.228058 | 0.094090 |
| **Sports** | 0.114916 | 0.160855 | 0.069003 | 0.135085 |
| **Role-Playing** | 0.111933 | 0.131949 | 0.316471 | 0.078061 |
| **Action** | 0.100784 | 0.121203 | 0.044331 | 0.219851 |
| **Misc** | 0.089185 | 0.096547 | 0.066571 | 0.087077 |
| **Racing** | 0.087628 | 0.108211 | 0.122319 | 0.140865 |
| **Puzzle** | 0.049366 | 0.019488 | 0.047359 | 0.014179 |
| **Simulation** | 0.021263 | 0.056170 | 0.057685 | 0.036603 |
| **Fighting** | 0.009824 | 0.006303 | 0.013205 | 0.007860 |
| **Adventure** | 0.008965 | 0.004926 | 0.013354 | 0.002235 |

In [139]:
```
scaledTG.transpose().plot.bar(stacked=True, figsize = (10,10))
```

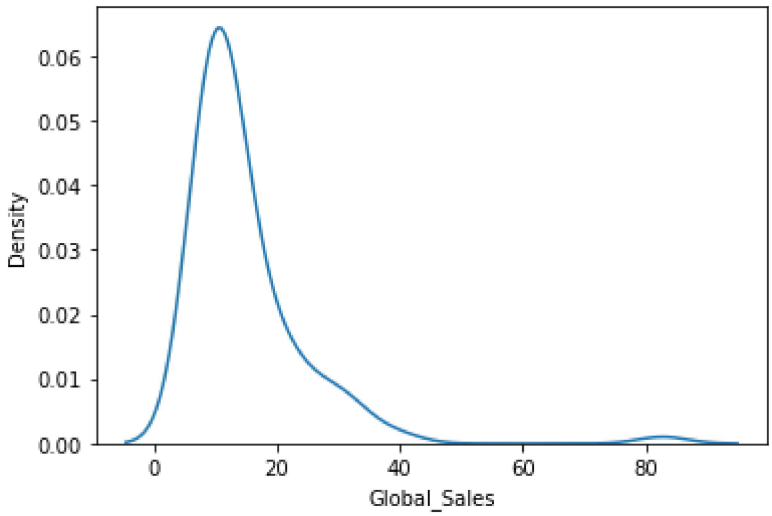
Out[139]: <AxesSubplot:>



# Statistical Data Visualisation

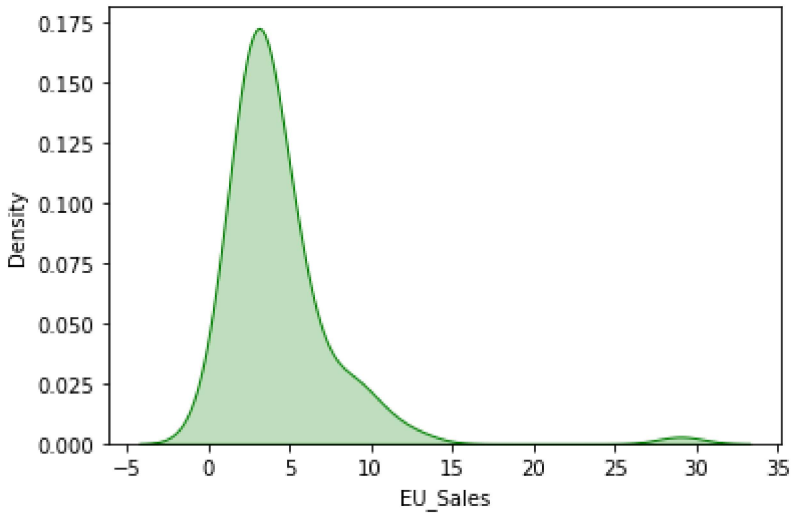
# KDEPLOT for Global Sales

In [140]:
```
sns.kdeplot(data['Global_Sales'])
plt.show()
```



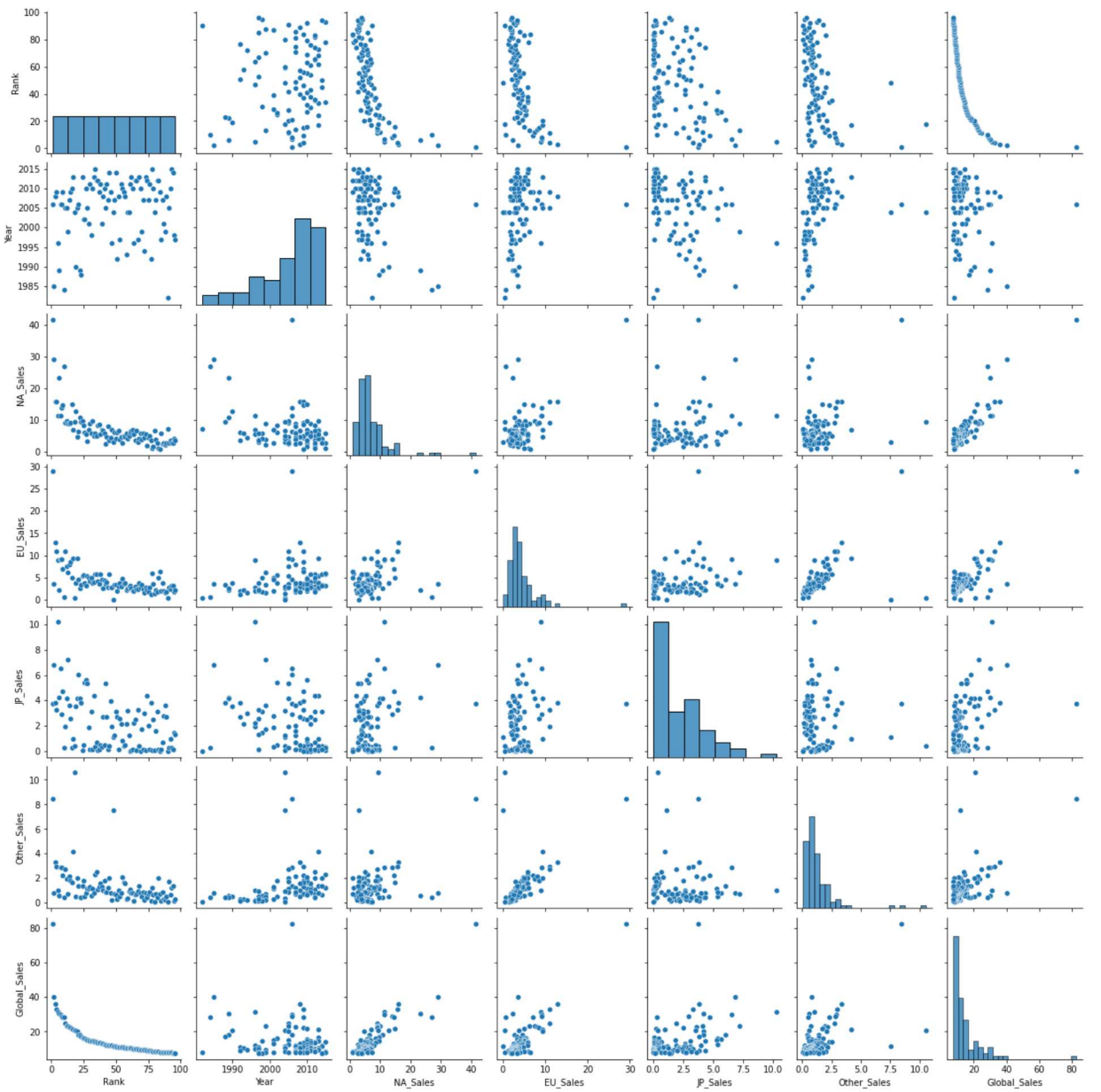

# KDE Plot for Europe Sales

In [141]:
```
sns.kdeplot(data['EU_Sales'],color='green',shade=True)
plt.show()
```

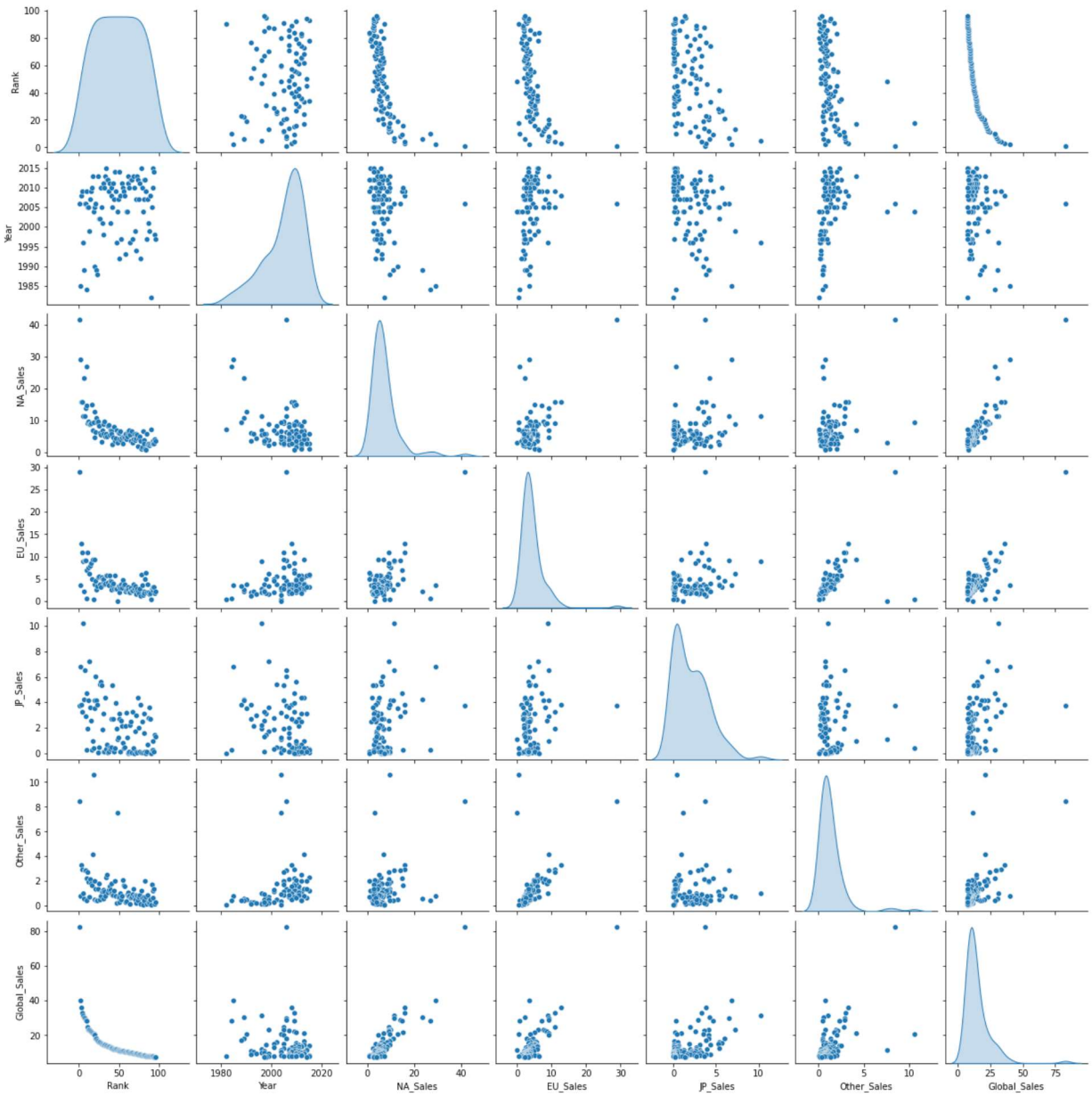


# PAIRPLOT

In [142]:
```
sns.pairplot(data)
plt.show()
```

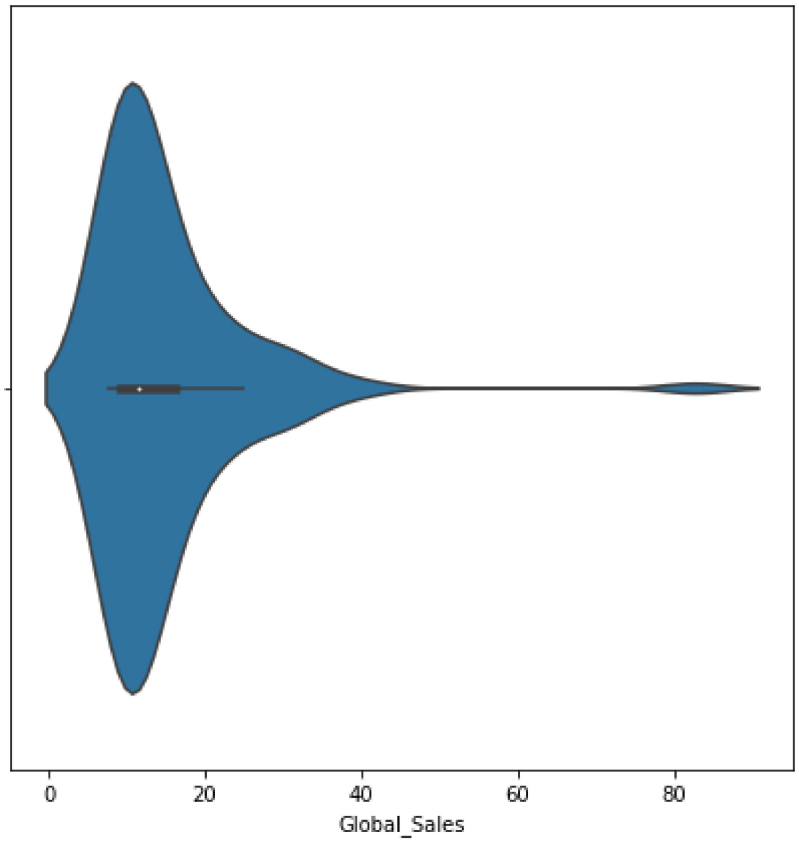


In [143]:
```
sns.pairplot(data,diag_kind='kde')
plt.show()
```




# VIOLIN PLOT of Global Sales

In [144]:
```
plt.figure(figsize=(7,7))
sns.violinplot(data.Global_Sales)
plt.show()
```



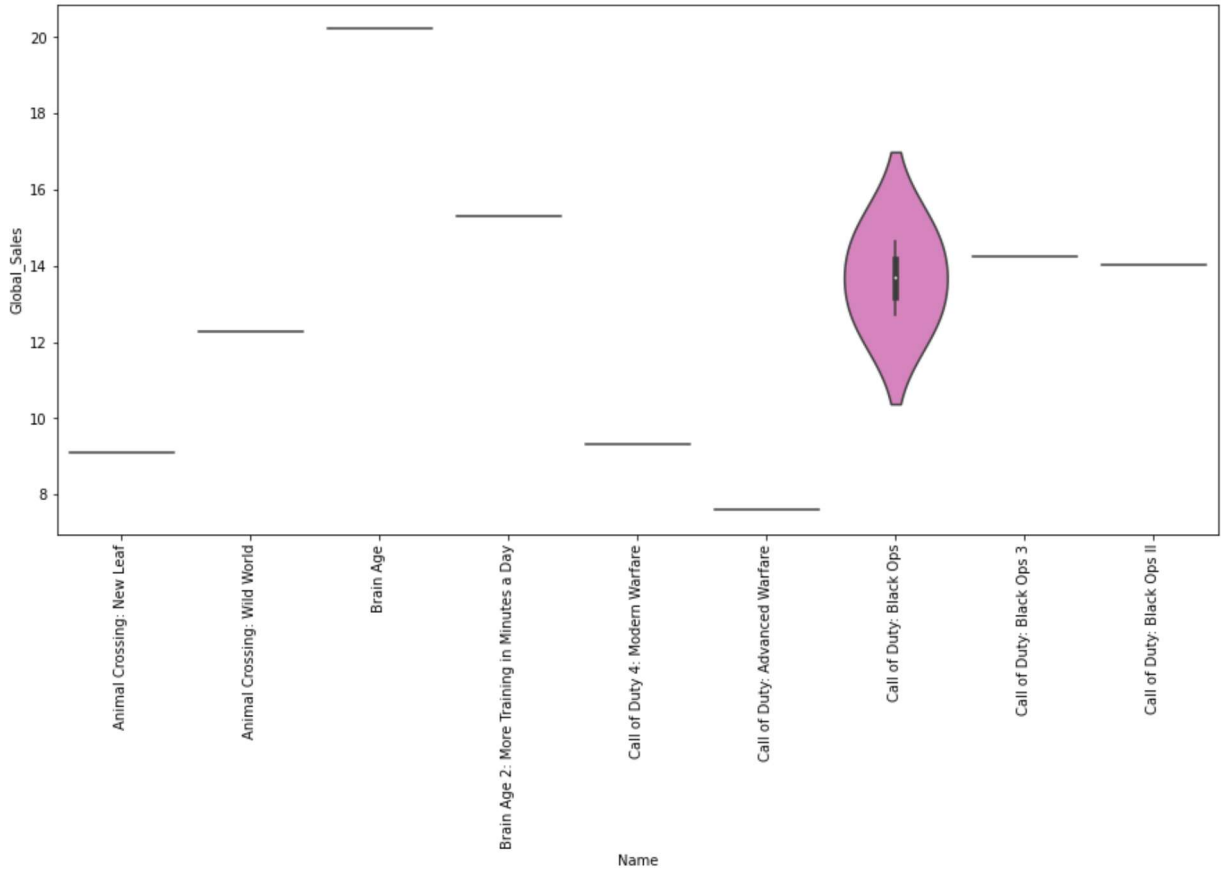

# Plot for 10 Games Sorted by Name and Global Sales

In [145]:
```
a2=data.sort_values('Name').head(10)
a2
```

Out[145]:

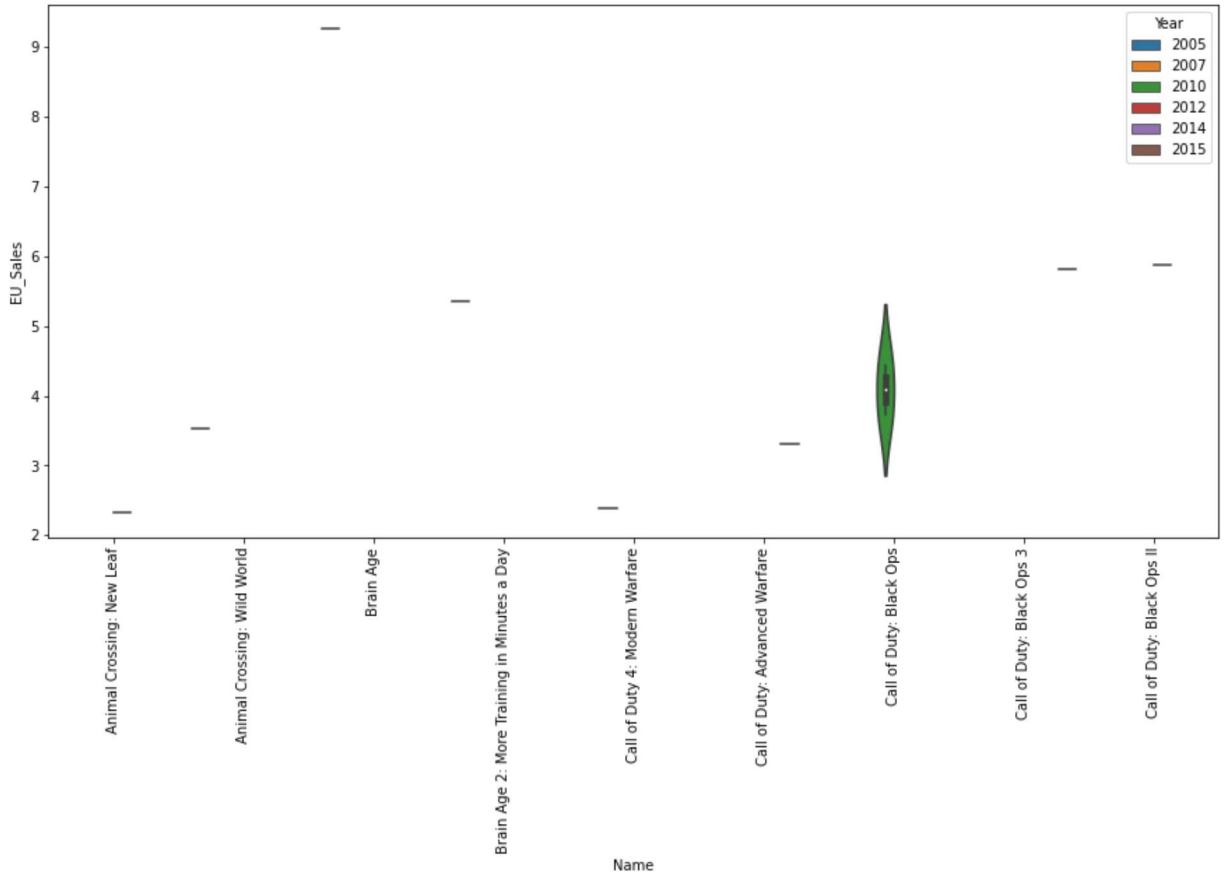
| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Other_S |
|---|---|---|---|---|---|---|---|---|---|---|
| **73** | 74 | Animal Crossing: New Leaf | 3DS | 2012 | Simulation | Nintendo | 2.01 | 2.32 | 4.36 | |
| **41** | 42 | Animal Crossing: Wild World | DS | 2005 | Simulation | Nintendo | 2.55 | 3.52 | 5.33 | |
| **19** | 20 | Brain Age | DS | 2005 | Misc | Nintendo | 4.75 | 9.26 | 4.16 | |
| **27** | 28 | Brain Age 2: More Training in Minutes a Day | DS | 2005 | Puzzle | Nintendo | 3.44 | 5.36 | 5.32 | |
| **70** | 71 | Call of Duty 4: Modern Warfare | X360 | 2007 | Shooter | Activision | 5.91 | 2.38 | 0.13 | |
| **93** | 94 | Call of Duty: Advanced Warfare | PS4 | 2014 | Shooter | Activision | 2.80 | 3.30 | 0.14 | |
| **31** | 32 | Call of Duty: Black Ops | X360 | 2010 | Shooter | Activision | 9.67 | 3.73 | 0.11 | |
| **40** | 41 | Call of Duty: Black Ops | PS3 | 2010 | Shooter | Activision | 5.98 | 4.44 | 0.48 | |
| **33** | 34 | Call of Duty: Black Ops 3 | PS4 | 2015 | Shooter | Activision | 5.77 | 5.81 | 0.35 | |
| **34** | 35 | Call of Duty: Black Ops II | PS3 | 2012 | Shooter | Activision | 4.99 | 5.88 | 0.65 | |

In [146]:
```
plt.figure(figsize=(15,7))
sns.violinplot(x='Name',y='Global_Sales',data=a2)
plt.xticks(rotation=90)
plt.show()
```



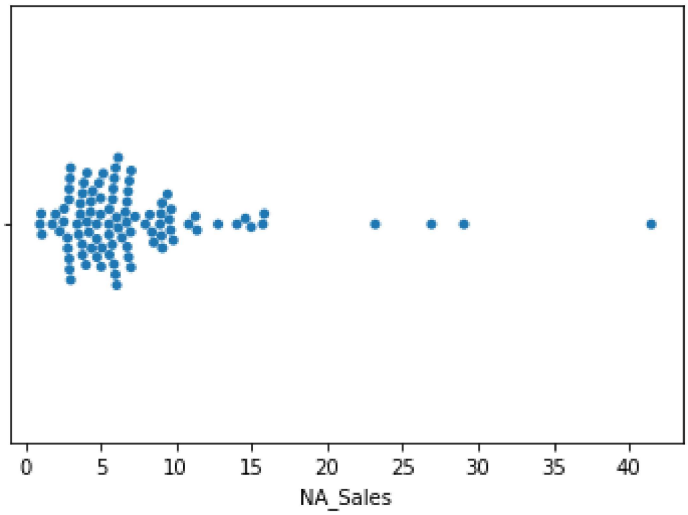

# Plot for 10 Games Sorted by Name and Europe Sales

In [147]:
```
plt.figure(figsize=(15,7))
sns.violinplot(x="Name",y='EU_Sales',hue='Year',data=a2)
plt.xticks(rotation=90)
plt.show()
```



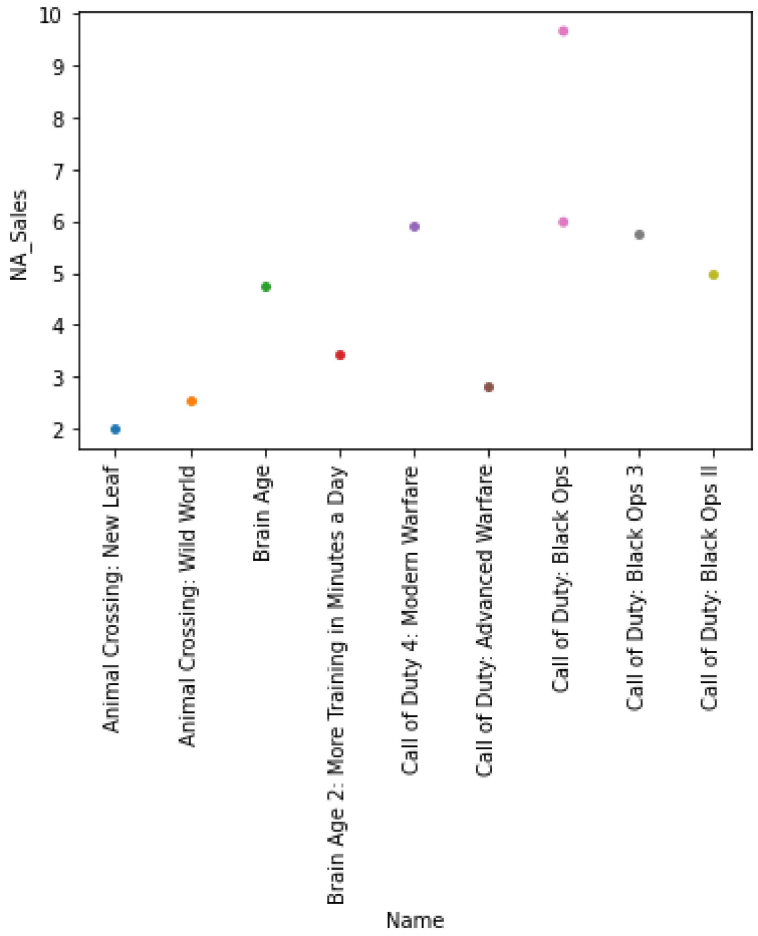

# SWARM PLOT for North American Sales

In [148]:
```
sns.swarmplot(data['NA_Sales'])
plt.show()
```




# Swarm Plot for 10 Games Sorted by Name and North American Sales

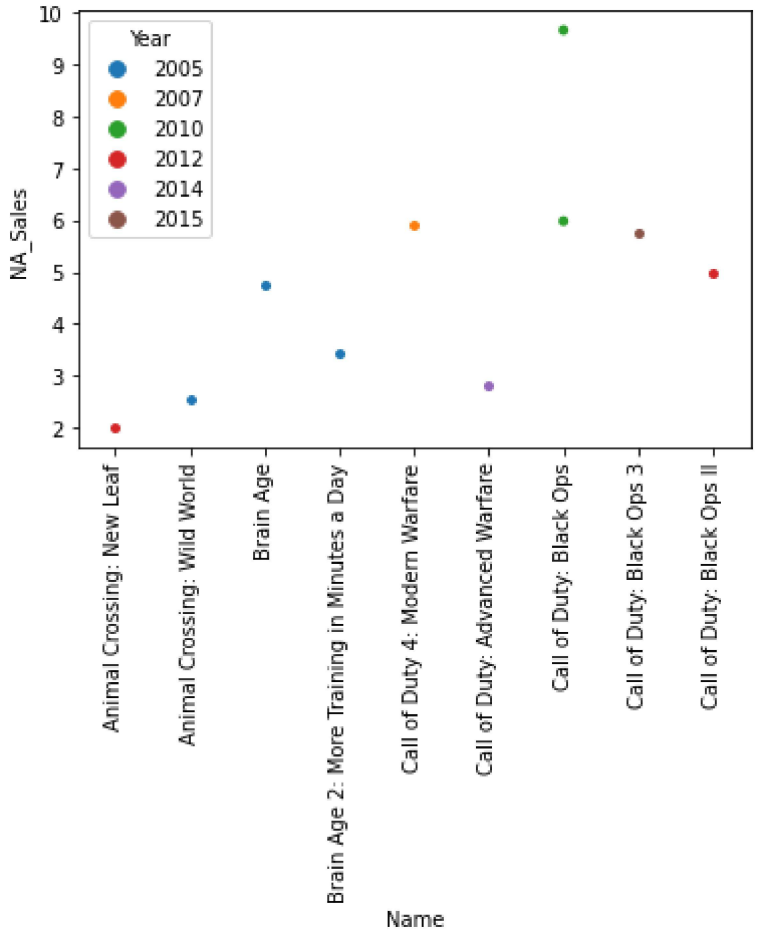
In [149]:
```
sns.swarmplot(x='Name',y='NA_Sales',data=a2)
plt.xticks(rotation=90)
plt.show()
```



# Swarm Plot for 10 Games Sorted by Name and North American Sales with

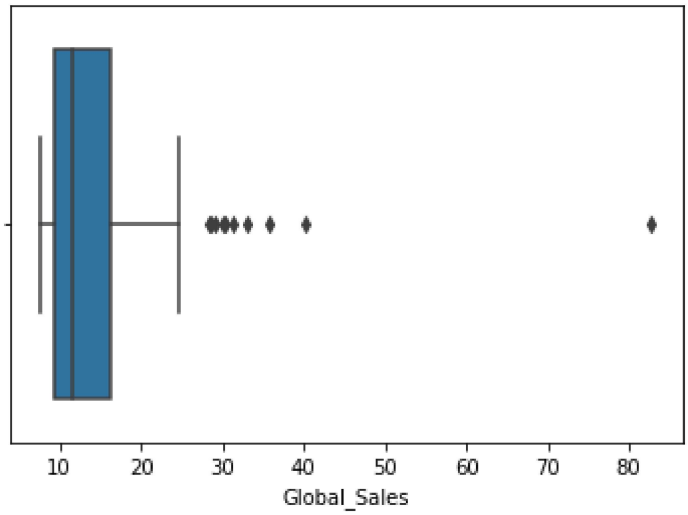
# Year as Hue

In [150]:
```
sns.swarmplot(x='Name',y='NA_Sales',hue='Year',data=a2)
plt.xticks(rotation=90)
plt.show()
```



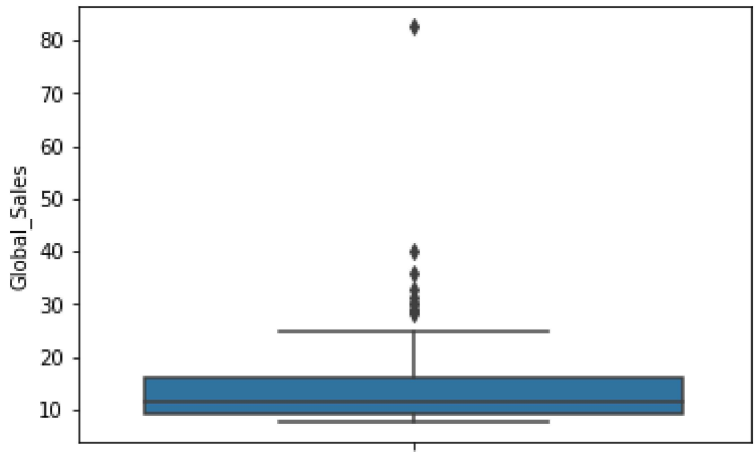

# BOX PLOT for Gobal Sales

In [151]:
```
sns.boxplot(data['Global_Sales'])
plt.show()
```




### Inversion of the above box plot

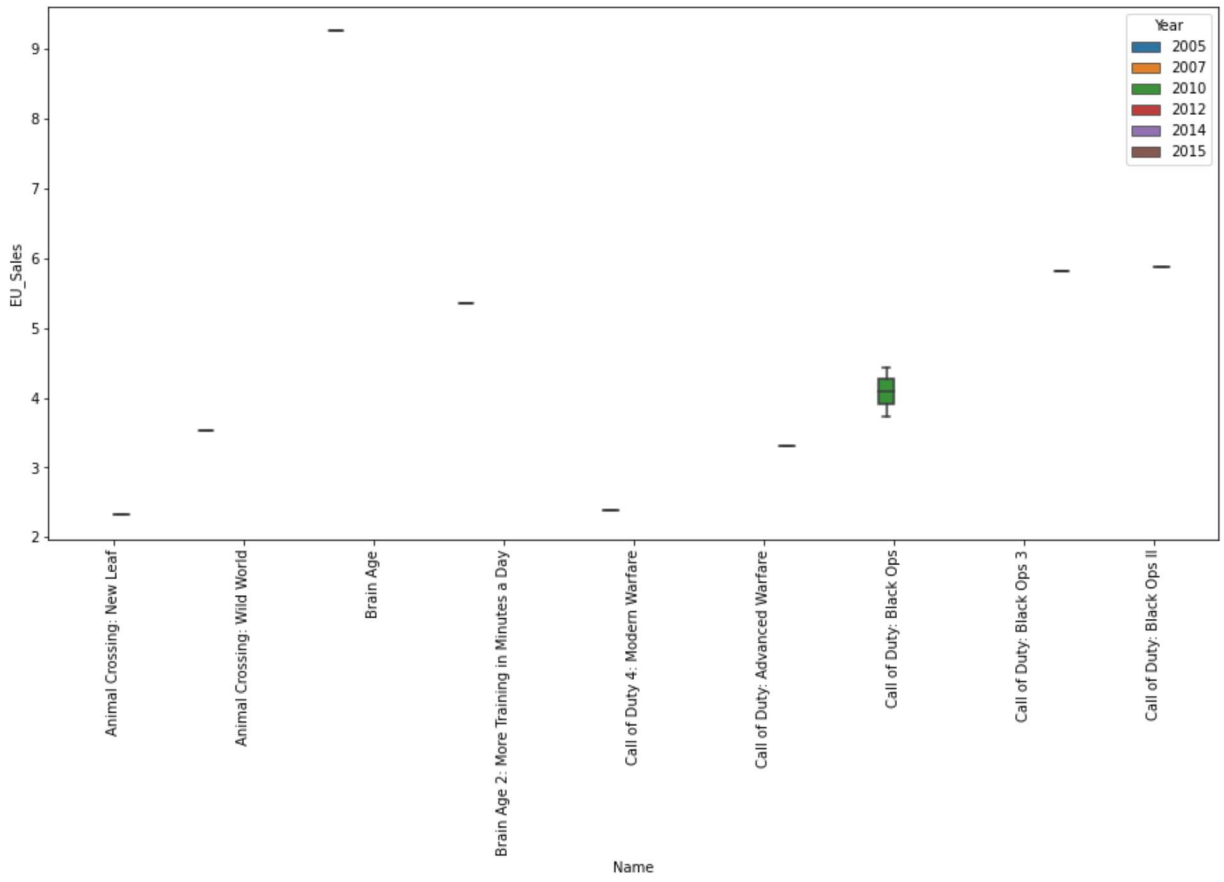
In [152]:
```
sns.boxplot(y=data['Global_Sales'])
plt.show()
```




# Box Plot Between Games and Europe Sales with

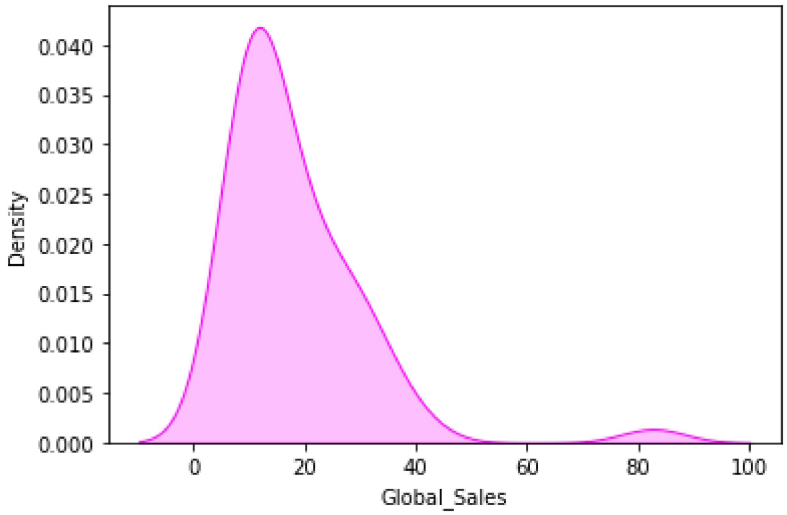
# Year as Hue

In [153]:
```
plt.figure(figsize=(15,7))
sns.boxplot(x='Name',y='EU_Sales',hue='Year',width=0.7,data=a2)
plt.xticks(rotation=90)
plt.show()
```



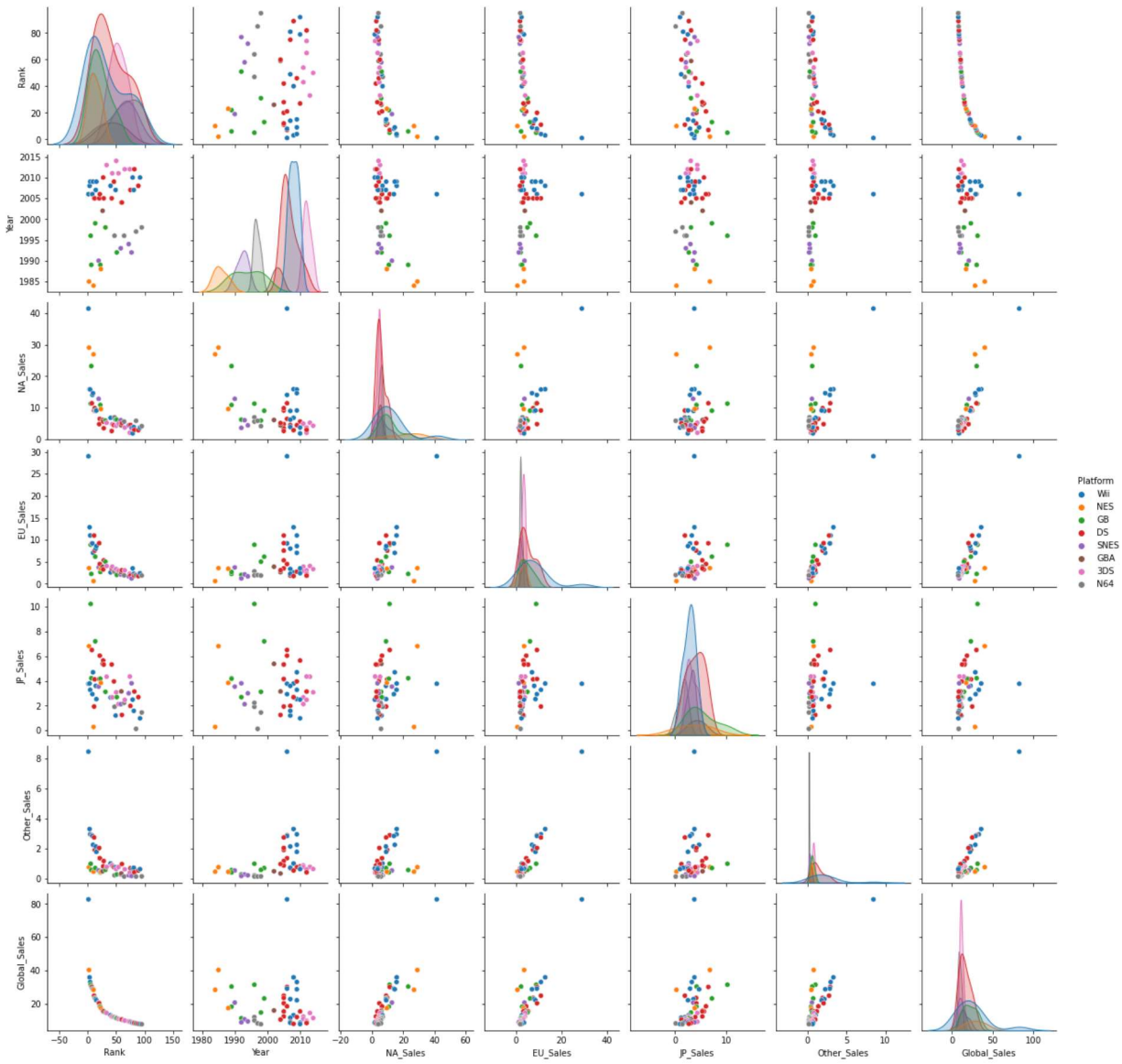

# KDE Plot for Nintendo's Global Sale

In [154]:
```
sns.kdeplot(data_nintendo['Global_Sales'],color='magenta',shade=True)
plt.show()
```




# Pair Plot for Nintendo with Hue as Platform

In [155]:
```
sns.pairplot(data_nintendo,diag_kind='kde',hue='Platform')
plt.show()
```



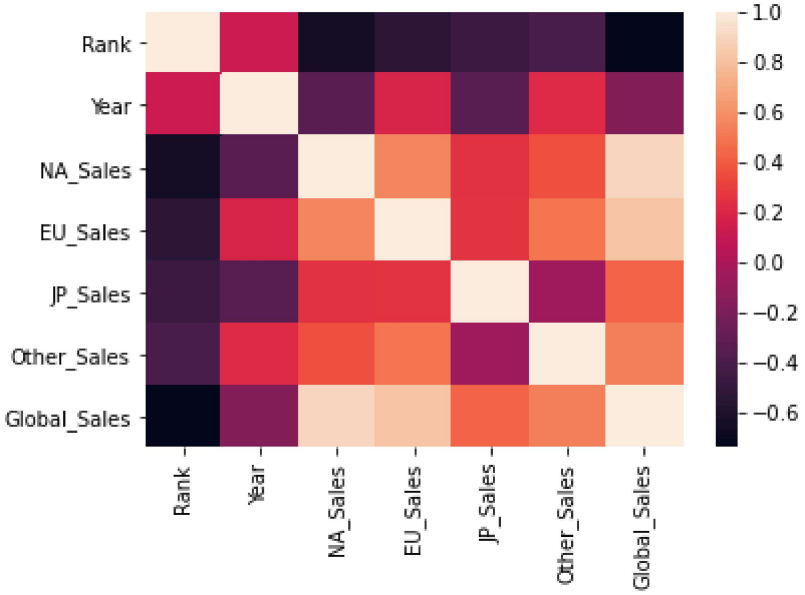
# HEATMAP

In [156]:
```
data.corr()
```

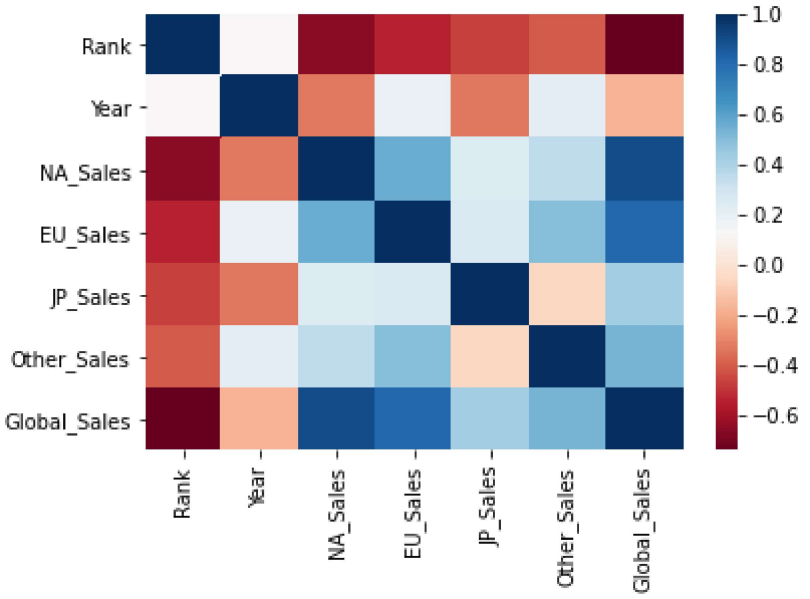
Out[156]:

| | Rank | Year | NA_Sales | EU_Sales | JP_Sales | Other_Sales | Global_Sales |
|---|---|---|---|---|---|---|---|
| **Rank** | 1.000000 | 0.127289 | -0.657309 | -0.537946 | -0.462587 | -0.399986 | -0.739582 |
| **Year** | 0.127289 | 1.000000 | -0.327936 | 0.192512 | -0.336856 | 0.211917 | -0.163147 |
| **NA_Sales** | -0.657309 | -0.327936 | 1.000000 | 0.564505 | 0.248103 | 0.355117 | 0.901666 |
| **EU_Sales** | -0.537946 | 0.192512 | 0.564505 | 1.000000 | 0.252680 | 0.498915 | 0.819937 |
| **JP_Sales** | -0.462587 | -0.336856 | 0.248103 | 0.252680 | 1.000000 | -0.053579 | 0.434380 |
| **Other_Sales** | -0.399986 | 0.211917 | 0.355117 | 0.498915 | -0.053579 | 1.000000 | 0.534322 |
| **Global_Sales** | -0.739582 | -0.163147 | 0.901666 | 0.819937 | 0.434380 | 0.534322 | 1.000000 |

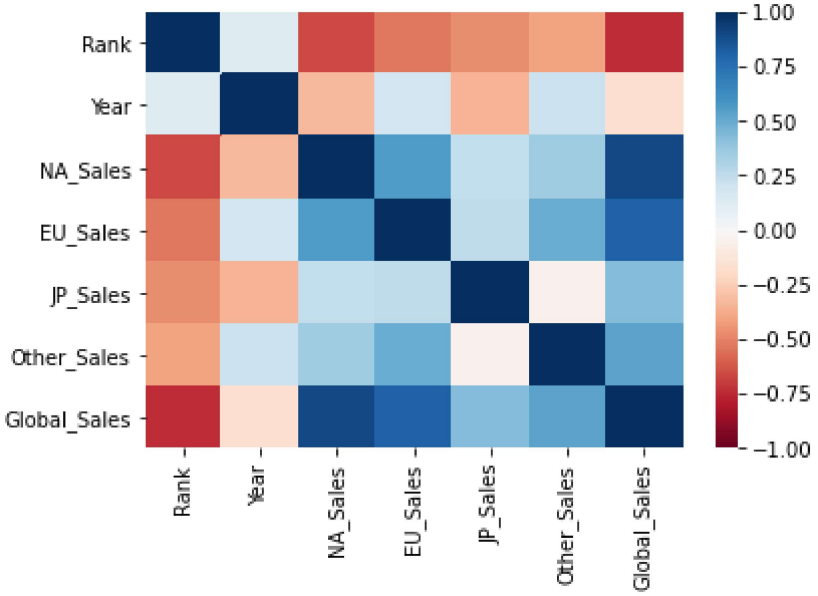
In [157]:
```
sns.heatmap(data.corr())
plt.show()
```



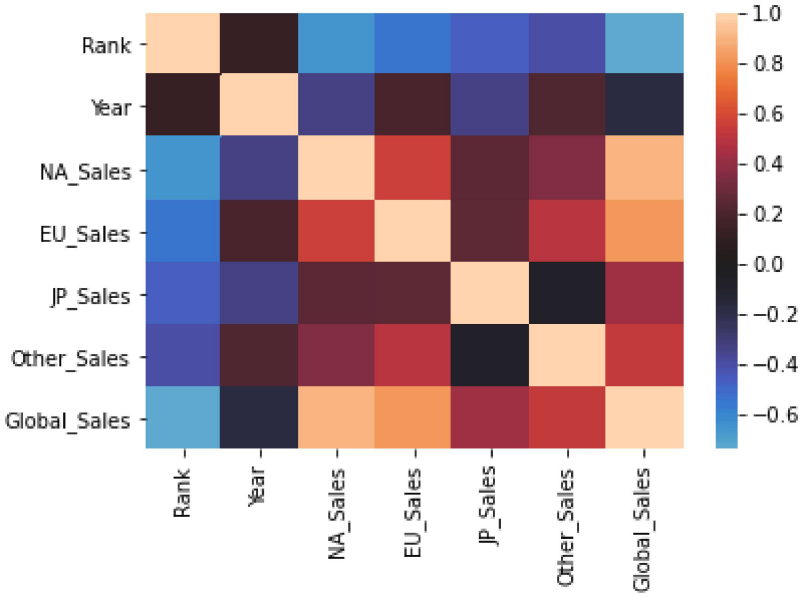
In [158]:
```
sns.heatmap(data.corr(), cmap='RdBu')
plt.show()
```



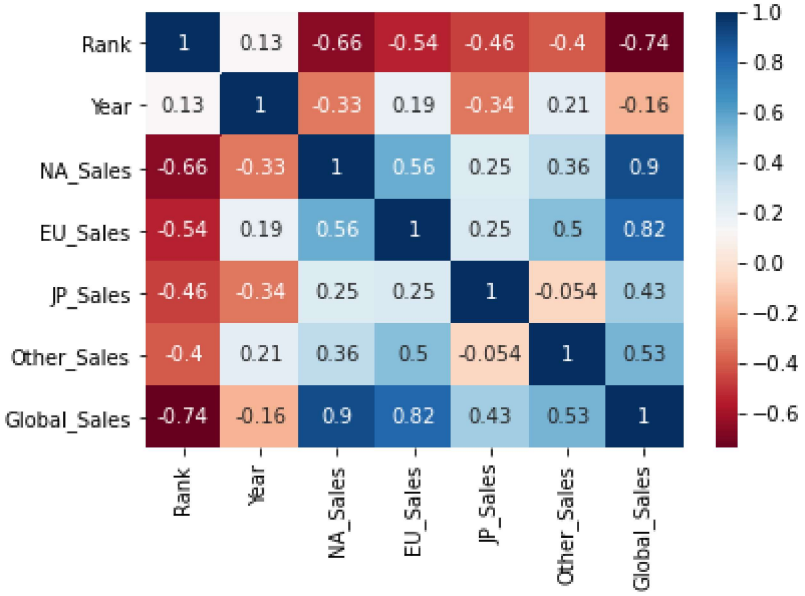

In [159]:
```
sns.heatmap(data.corr(), cmap='RdBu', vmin=-1, vmax=1)
plt.show()
```



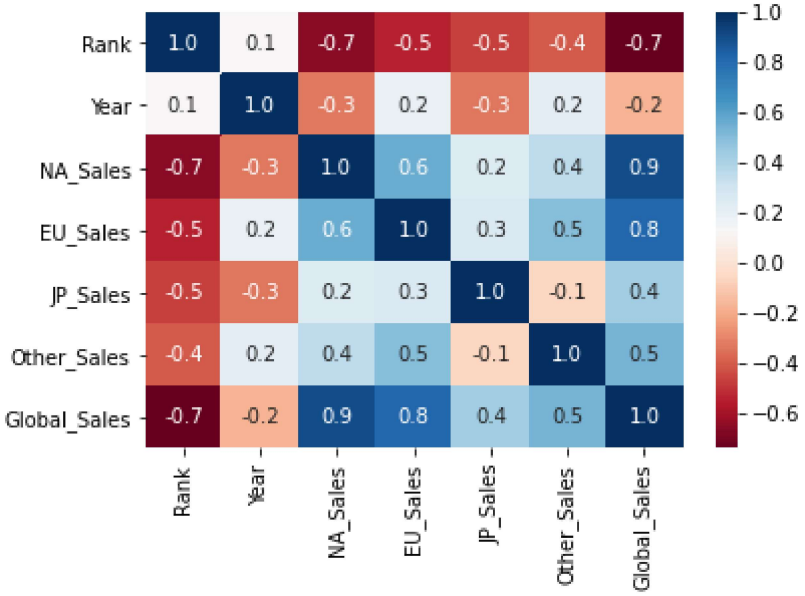
In [160]:
```
sns.heatmap(data.corr(),center=0)
plt.show()
```



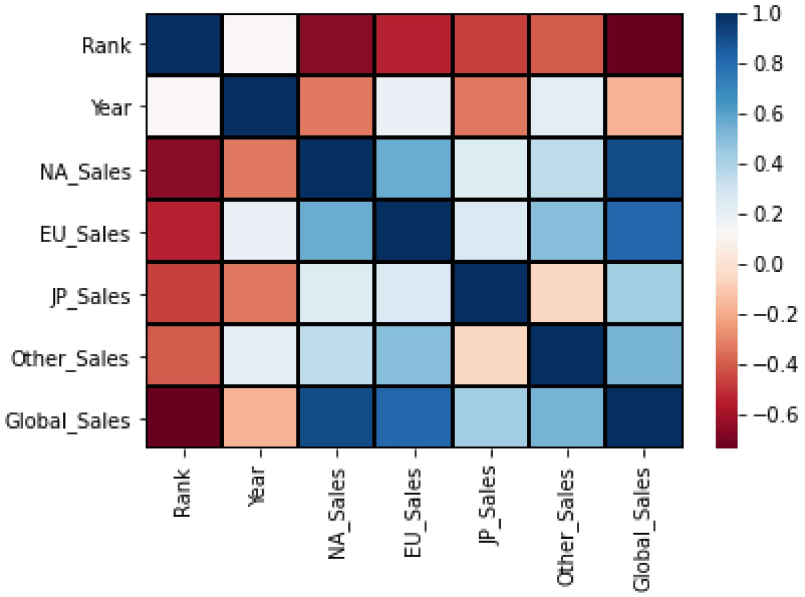

In [161]:
```
sns.heatmap(data.corr(), cmap='RdBu', annot=True)
plt.show()
```



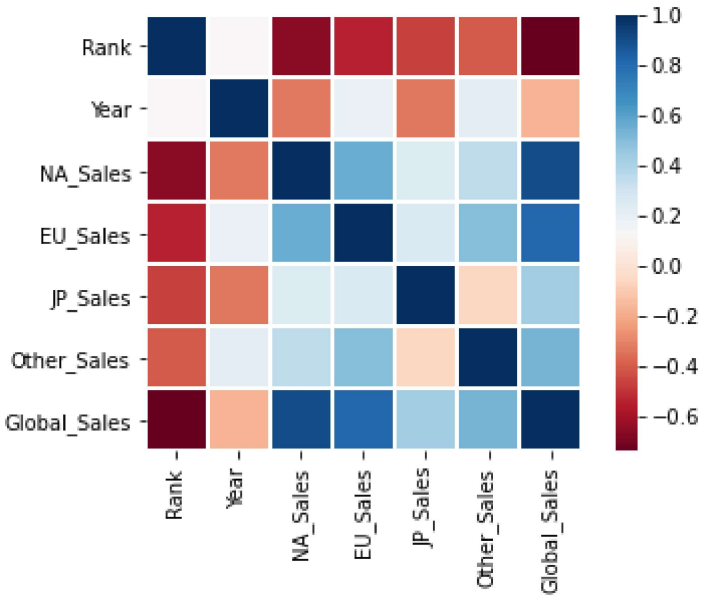
In [162]:
```
sns.heatmap(data.corr(), cmap='RdBu', annot=True, fmt='.1f')
plt.show()
```




In [163]:
```
sns.heatmap(data.corr(), cmap='RdBu', linewidth=1,linecolor='black')
plt.show()
```

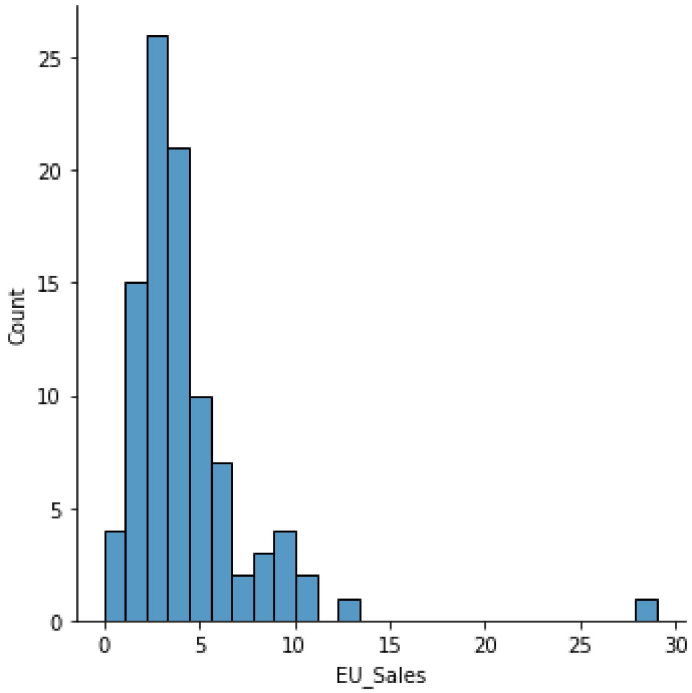


In [164]:
```
sns.heatmap(data.corr(), cmap='RdBu',linewidth=1,square=True)
plt.show()
```



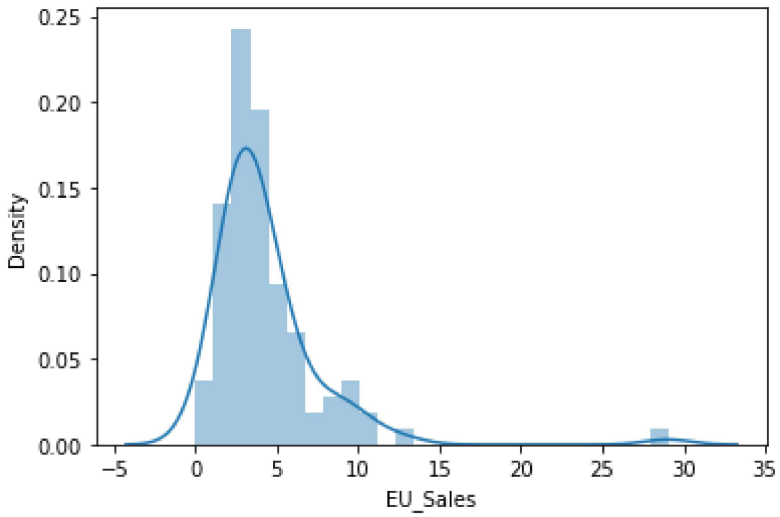

# DISPLOT for Europe Sales

In [165]:
```
sns.displot(data.EU_Sales)
plt.show()
```

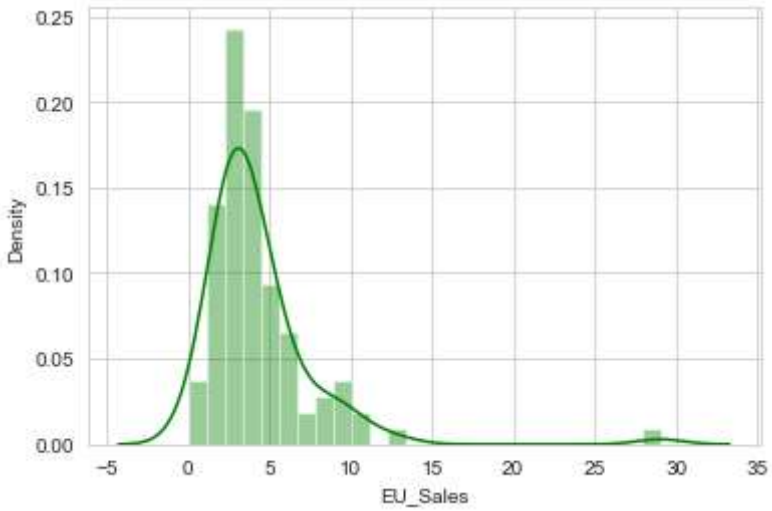



# DISTPLOT for Europe Sales

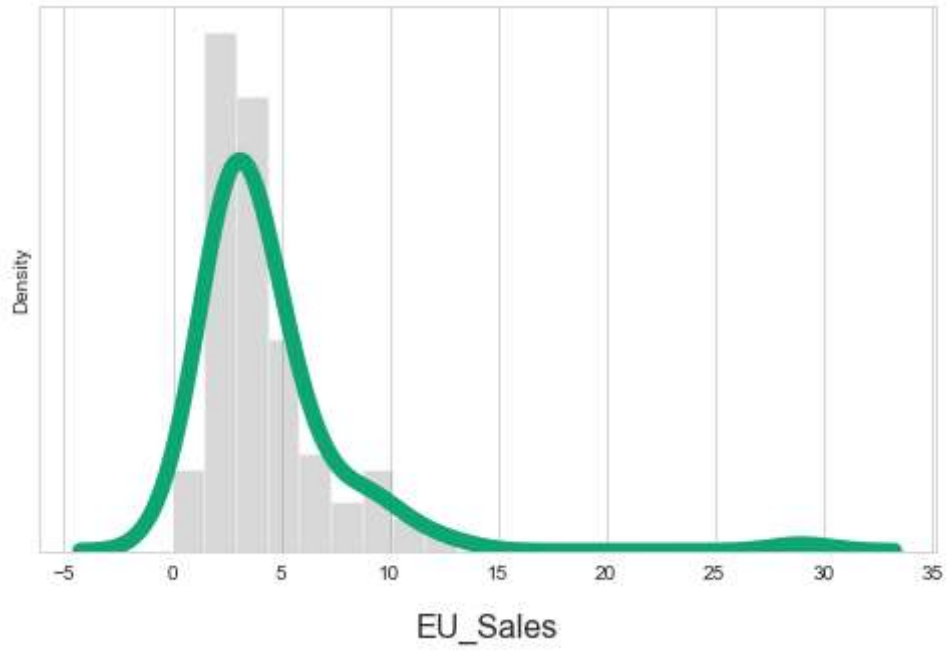
In [166]:
```
sns.distplot(data.EU_Sales)
plt.show()
```




In [167]:
```
sns.set_style("whitegrid")
sns.distplot(data.EU_Sales,color='green')
plt.show()
```

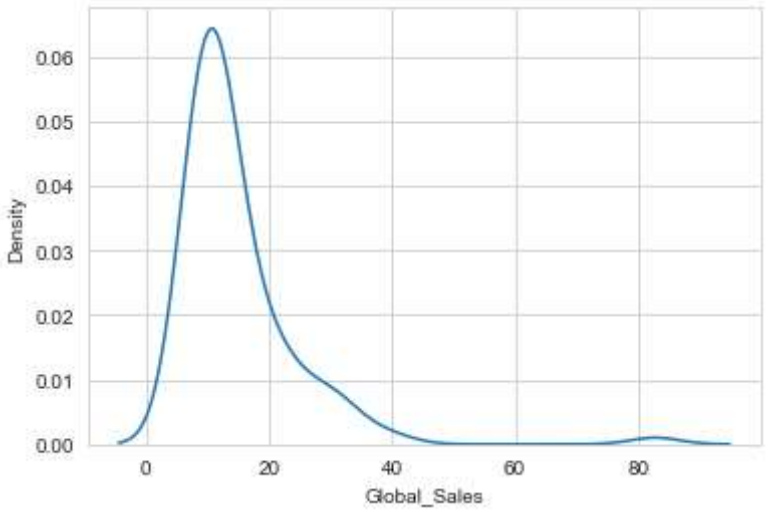


In [168]:
```
plt.figure(figsize=(8,5))
sns.distplot(data.EU_Sales,
             bins=20,
             kde_kws={'lw':8,'color':'xkcd:bluish green'},
             hist_kws={'alpha':0.3,'color':'grey'})
plt.xlabel('EU_Sales',fontsize=16,labelpad=15)
plt.yticks([])
plt.show()
```

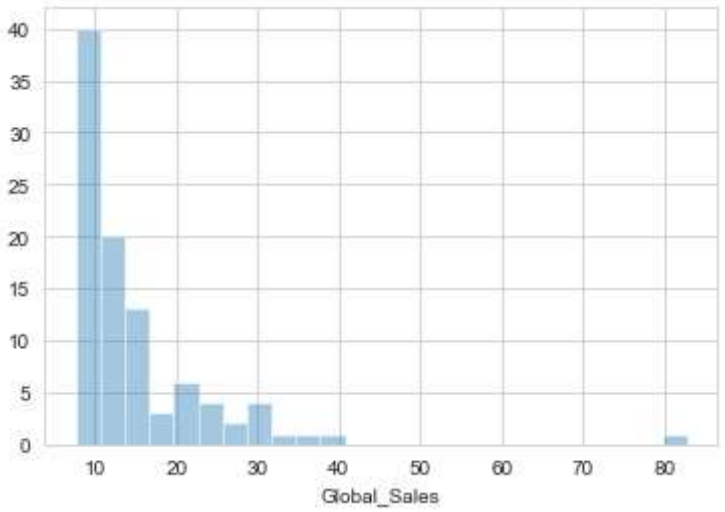



# Distplot for Global Sales

In [169]:
```
sns.distplot(data.Global_Sales,hist=False)
plt.show()
```




In [170]:
```
sns.distplot(data.Global_Sales,kde=False)
plt.show()
```




# CONCLUSION

# Top Games by Global Sales

**Wii sports has the maximum Global sales. Super Mario Bros has the second maximum global Sales.**

# Countrywise Top Sales

**North America has maximum sales among others. Europe has the next maximum sales.**

**In North America shooter genre has the maximum sales.Then platform genre has the second maximum sales.**

**And most sold game is Wii Sports in the sports genre.**

# Top Publisher

**The most popular publisher is Nintendo. Nintendo Global Sales mean from 1984 to 2015= 18.1074.Activision was the next most popular publisher.**

# Top Genre

**The most popular genre is platform. Shooter has the next position.**

# Top Platform

**The most number of video games published is in Wii platform. X360 platform has the second position in most number of video games published.**

# Yearwise Data

**2010 is the year in which most number of video games are published. 2012,2009 and 2007 are in the next position.**