```
In [2]: import numpy as np
        import pandas as pd
```

```
In [3]: data=pd.read_csv("C:\\Users\\likit\\OneDrive\\Desktop\\vgsales.csv")
        data
```

Out[3]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.00	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.00	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.00	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

16598 rows × 11 columns

```
In [4]: data.head()
```

Out[4]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_Sales
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	8.46
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	0.77
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	3.31
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	2.96
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	1.00

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

Out[5]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.0	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.0	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.0	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.0	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.0	

```
In [6]: data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 16598 entries, 0 to 16597
Data columns (total 11 columns):
 #   Column        Non-Null Count  Dtype
---  ------        --------------  -----
 0   Rank          16598 non-null  int64
 1   Name          16598 non-null  object
 2   Platform      16598 non-null  object
 3   Year          16327 non-null  float64
 4   Genre         16598 non-null  object
 5   Publisher     16540 non-null  object
 6   NA_Sales      16598 non-null  float64
 7   EU_Sales      16598 non-null  float64
 8   JP_Sales      16598 non-null  float64
 9   Other_Sales   16598 non-null  float64
 10  Global_Sales  16598 non-null  float64
dtypes: float64(6), int64(1), object(4)
memory usage: 1.4+ MB
```

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

Out[7]: (16598, 11)

```
In [8]: data.describe()
```

Out[8]:

	Rank	Year	NA_Sales	EU_Sales	JP_Sales	Other_Sales	Global_Sale
count	16598.000000	16327.000000	16598.000000	16598.000000	16598.000000	16598.000000	16598.00000
mean	8300.605254	2006.406443	0.264667	0.146652	0.077782	0.048063	0.53744
std	4791.853933	5.828981	0.816683	0.505351	0.309291	0.188588	1.55502
min	1.000000	1980.000000	0.000000	0.000000	0.000000	0.000000	0.01000
25%	4151.250000	2003.000000	0.000000	0.000000	0.000000	0.000000	0.06000
50%	8300.500000	2007.000000	0.080000	0.020000	0.000000	0.010000	0.17000
75%	12449.750000	2010.000000	0.240000	0.110000	0.040000	0.040000	0.47000
max	16600.000000	2020.000000	41.490000	29.020000	10.220000	10.570000	82.74000

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

Out[9]:
```
Rank            0
Name            0
Platform        0
Year          271
Genre           0
Publisher      58
NA_Sales        0
EU_Sales        0
JP_Sales        0
Other_Sales     0
Global_Sales    0
dtype: int64
```

```
In [10]: data.dropna()
```

Out[10]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.00	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.00	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.00	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

16291 rows × 11 columns

```
In [11]: data["Year"].fillna(0,inplace=True)
         data
```

Out[11]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.00	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.00	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.00	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

16598 rows × 11 columns

```
In [12]: data["Publisher"].fillna("NA",inplace=True)
         data
```

Out[12]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.00	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.00	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.00	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

16598 rows × 11 columns

```
In [13]: data.isnull().sum()
```

Out[13]:
```
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
```

Data Filtering:

```
In [14]:   # Games released after 2000
           data[data["Year"]>2000]
```

Out[14]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
6	7	New Super Mario Bros.	DS	2006.0	Platform	Nintendo	11.38	9.23	6.50	
7	8	Wii Play	Wii	2006.0	Misc	Nintendo	14.03	9.20	2.93	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.00	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.00	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.00	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

14004 rows × 11 columns

```
In [15]:   # Filter sports genre games
           data[data['Genre'] == 'Sports']
```

Out[15]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_Sal
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	8.
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	2.
13	14	Wii Fit	Wii	2007.0	Sports	Nintendo	8.94	8.03	3.60	2.
14	15	Wii Fit Plus	Wii	2009.0	Sports	Nintendo	9.09	8.59	2.53	1.
77	78	FIFA 16	PS4	2015.0	Sports	Electronic Arts	1.11	6.06	0.06	1.
...	...	...	...	...	...	...	...	...	...	
16576	16579	Rugby Challenge 3	XOne	2016.0	Sports	Alternative Software	0.00	0.01	0.00	0.
16578	16581	Outdoors Unleashed: Africa 3D	3DS	2011.0	Sports	Mastiff	0.01	0.00	0.00	0.
16579	16582	PGA European Tour	N64	2000.0	Sports	Infogrames	0.01	0.00	0.00	0.
16581	16584	Fit & Fun	Wii	2011.0	Sports	Unknown	0.00	0.01	0.00	0.
16587	16590	Mezase!! Tsuri Master DS	DS	2009.0	Sports	Hudson Soft	0.00	0.00	0.01	0.

2346 rows × 11 columns

```
In [16]:  # Filter games with greater than 5 million
          data[data['Global_Sales'] > 5]
```

Out[16]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_Sa
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	8
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	0
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	3
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	2
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	1
...	...	...	...	...	...	...	...	...	...	
200	201	Super Mario Bros.	GB	1999.0	Platform	Nintendo	3.40	1.30	0.15	0
201	202	Resident Evil	PS	1996.0	Action	Virgin Interactive	2.05	1.16	1.11	0
202	203	Tony Hawk's Pro Skater	PS	1999.0	Sports	Activision	3.42	1.38	0.02	0
203	204	Super Smash Bros. for Wii U and 3DS	WiiU	2014.0	Fighting	Nintendo	2.59	1.06	0.80	0
204	205	Warzone 2100	PS	1999.0	Strategy	Eidos Interactive	2.79	1.89	0.00	0

205 rows × 11 columns

```
In [17]:  #Filter games that are not sold in japan
          data[data['JP_Sales'] == 0]
```

Out[17]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Othe
60	61	Just Dance 3	Wii	2011.0	Misc	Ubisoft	6.05	3.15	0.0	
83	84	The Sims 3	PC	2009.0	Simulation	Electronic Arts	0.98	6.42	0.0	
89	90	Pac-Man	2600	1982.0	Puzzle	Atari	7.28	0.45	0.0	
98	99	Call of Duty: World at War	X360	2008.0	Shooter	Activision	4.79	1.90	0.0	
102	103	Just Dance	Wii	2009.0	Misc	Ubisoft	3.51	3.03	0.0	
...	...	...	...	...	...	...	...	...	...	
16593	16596	Woody Woodpecker in Crazy Castle 5	GBA	2002.0	Platform	Kemco	0.01	0.00	0.0	
16594	16597	Men in Black II: Alien Escape	GC	2003.0	Shooter	Infogrames	0.01	0.00	0.0	
16595	16598	SCORE International Baja 1000: The Official Game	PS2	2008.0	Racing	Activision	0.00	0.00	0.0	
16596	16599	Know How 2	DS	2010.0	Puzzle	7G//AMES	0.00	0.01	0.0	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.0	

10455 rows × 11 columns

Grouping:

```
In [18]:  # Total global sales for genre
          data.groupby('Genre')['Global_Sales'].sum().sort_values(ascending=False)
```

Out[18]:
```
Genre
Action          1751.18
Sports          1330.93
Shooter         1037.37
Role-Playing     927.37
Platform         831.37
Misc             809.96
Racing           732.04
Fighting         448.91
Simulation       392.20
Puzzle           244.95
Adventure        239.04
Strategy         175.12
Name: Global_Sales, dtype: float64
```

```
In [19]:  # Total sales by publisher
          data.groupby('Publisher')['Global_Sales'].sum().nlargest(10)
```

```
Out[19]:  Publisher
          Nintendo                        1786.56
          Electronic Arts                 1110.32
          Activision                       727.46
          Sony Computer Entertainment      607.50
          Ubisoft                          474.72
          Take-Two Interactive             399.54
          THQ                              340.77
          Konami Digital Entertainment     283.64
          Sega                             272.99
          Namco Bandai Games               254.09
          Name: Global_Sales, dtype: float64
```

```
In [20]:  # Total sales by gener and region
          data.groupby('Genre')[['NA_Sales', 'EU_Sales', 'JP_Sales', 'Other_Sales']].sum()
```

Out[20]:

Genre	NA_Sales	EU_Sales	JP_Sales	Other_Sales
Action	877.83	525.00	159.95	187.38
Adventure	105.80	64.13	52.07	16.81
Fighting	223.59	101.32	87.35	36.68
Misc	410.24	215.98	107.76	75.32
Platform	447.05	201.63	130.77	51.59
Puzzle	123.78	50.78	57.31	12.55
Racing	359.42	238.39	56.69	77.27
Role-Playing	327.28	188.06	352.31	59.61
Shooter	582.60	313.27	38.28	102.69
Simulation	183.31	113.38	63.70	31.52
Sports	683.35	376.85	135.37	134.97
Strategy	68.70	45.34	49.46	11.36

```
In [21]:  # AVG sales by year
          data.groupby('Year')['Global_Sales'].mean()
```

```
Out[21]:  Year
          0.0       0.369299
          1980.0    1.264444
          1981.0    0.777609
          1982.0    0.801667
          1983.0    0.987647
          1984.0    3.597143
          1985.0    3.852857
          1986.0    1.765238
          1987.0    1.358750
          1988.0    3.148000
          1989.0    4.320588
          1990.0    3.086875
          1991.0    0.786098
          1992.0    1.771163
          1993.0    0.766333
          1994.0    0.654298
          1995.0    0.402329
          1996.0    0.757224
          1997.0    0.695433
          1998.0    0.676702
          1999.0    0.743402
          2000.0    0.577536
          2001.0    0.687697
          2002.0    0.477105
          2003.0    0.461742
          2004.0    0.549554
          2005.0    0.488778
          2006.0    0.516905
          2007.0    0.508428
          2008.0    0.475420
          2009.0    0.466317
          2010.0    0.476926
          2011.0    0.453020
          2012.0    0.553333
          2013.0    0.674194
          2014.0    0.579124
          2015.0    0.430684
          2016.0    0.206192
          2017.0    0.016667
          2020.0    0.290000
          Name: Global_Sales, dtype: float64
```

Sorting:

In [22]:
```python
# Sort by global sales in descending order
data.sort_values(by='Global_Sales', ascending=False)
```

Out[22]:

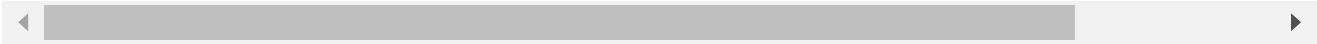|	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Ot
0	1	Wii Sports	Wii	2006.0	Sports	Nintendo	41.49	29.02	3.77	
1	2	Super Mario Bros.	NES	1985.0	Platform	Nintendo	29.08	3.58	6.81	
2	3	Mario Kart Wii	Wii	2008.0	Racing	Nintendo	15.85	12.88	3.79	
3	4	Wii Sports Resort	Wii	2009.0	Sports	Nintendo	15.75	11.01	3.28	
4	5	Pokemon Red/Pokemon Blue	GB	1996.0	Role-Playing	Nintendo	11.27	8.89	10.22	
...	...	...	...	...	...	...	...	...	...	
16186	16189	BattleForge	PC	2009.0	Strategy	Electronic Arts	0.00	0.01	0.00	
16187	16190	Jewel Quest II	PC	2007.0	Puzzle	Avanquest	0.00	0.01	0.00	
16188	16191	Toro to Morimori	PS3	2009.0	Misc	Sony Computer Entertainment	0.00	0.00	0.01	
16189	16192	Sonic & All-Stars Racing Transformed	PC	2013.0	Racing	Sega	0.00	0.01	0.00	
16597	16600	Spirits & Spells	GBA	2003.0	Platform	Wanadoo	0.01	0.00	0.00	

16598 rows × 11 columns

```
In [23]: # Sort by year and name in ascending order
         data.sort_values(by=['Year', 'Name'])
```

Out[23]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Other_
16198	16201	AKB1/48: Idol to Guam de Koishitara...	X360	0.0	Misc	NA	0.00	0.00	0.01	
11076	11078	Action Man-Operation Extreme	PS	0.0	Action	NA	0.05	0.03	0.00	
3217	3219	Advance Wars: Days of Ruin	DS	0.0	Strategy	Nintendo	0.44	0.13	0.00	
1513	1515	Adventure	2600	0.0	Adventure	Atari	1.21	0.08	0.00	
16246	16249	Agarest Senki: Re-appearance	PS3	0.0	Role-Playing	Idea Factory	0.00	0.00	0.01	
...	...	...	...	...	...	...	...	...	...	
12925	12927	ZombiU	PS4	2016.0	Action	Ubisoft	0.00	0.04	0.01	
16438	16441	Brothers Conflict: Precious Baby	PSV	2017.0	Action	Idea Factory	0.00	0.00	0.01	
14390	14393	Phantasy Star Online 2 Episode 4: Deluxe Package	PS4	2017.0	Role-Playing	Sega	0.00	0.00	0.03	
16241	16244	Phantasy Star Online 2 Episode 4: Deluxe Package	PSV	2017.0	Role-Playing	Sega	0.00	0.00	0.01	
5957	5959	Imagine: Makeup Artist	DS	2020.0	Simulation	Ubisoft	0.27	0.00	0.00	

16598 rows × 11 columns

In [24]: ```python
# Sort by North america sales and europe sales
data.sort_values(by=['NA_Sales', 'EU_Sales'], ascending=[False, False])
```

Out[24]:

| | Rank | Name | Platform | Year | Genre | Publisher | NA_Sales | EU_Sales | JP_Sales | Othe |
|---|---|---|---|---|---|---|---|---|---|---|
| **0** | 1 | Wii Sports | Wii | 2006.0 | Sports | Nintendo | 41.49 | 29.02 | 3.77 | |
| **1** | 2 | Super Mario Bros. | NES | 1985.0 | Platform | Nintendo | 29.08 | 3.58 | 6.81 | |
| **9** | 10 | Duck Hunt | NES | 1984.0 | Shooter | Nintendo | 26.93 | 0.63 | 0.28 | |
| **5** | 6 | Tetris | GB | 1989.0 | Puzzle | Nintendo | 23.20 | 2.26 | 4.22 | |
| **2** | 3 | Mario Kart Wii | Wii | 2008.0 | Racing | Nintendo | 15.85 | 12.88 | 3.79 | |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | |
| **16580** | 16583 | Real Rode | PS2 | 2008.0 | Adventure | Kadokawa Shoten | 0.00 | 0.00 | 0.01 | |
| **16587** | 16590 | Mezase!! Tsuri Master DS | DS | 2009.0 | Sports | Hudson Soft | 0.00 | 0.00 | 0.01 | |
| **16589** | 16592 | Chou Ezaru wa Akai Hana: Koi wa Tsuki ni Shiru... | PSV | 2016.0 | Action | dramatic create | 0.00 | 0.00 | 0.01 | |
| **16590** | 16593 | Eiyuu Densetsu: Sora no Kiseki Material Collec... | PSP | 2007.0 | Role-Playing | Falcom Corporation | 0.00 | 0.00 | 0.01 | |
| **16595** | 16598 | SCORE International Baja 1000: The Official Game | PS2 | 2008.0 | Racing | Activision | 0.00 | 0.00 | 0.00 | |

16598 rows × 11 columns

```
In [25]:   # Sort by Names
           data.sort_values(by='Name')
```

Out[25]:

	Rank	Name	Platform	Year	Genre	Publisher	NA_Sales	EU_Sales	JP_Sales	Ot
4754	4756	'98 Koshien	PS	1998.0	Sports	Magical Company	0.15	0.10	0.12	
8357	8359	.hack//G.U. Vol.1//Rebirth	PS2	2006.0	Role-Playing	Namco Bandai Games	0.00	0.00	0.17	
7107	7109	.hack//G.U. Vol.2//Reminisce	PS2	2006.0	Role-Playing	Namco Bandai Games	0.11	0.09	0.00	
8602	8604	.hack//G.U. Vol.2//Reminisce (jp sales)	PS2	2006.0	Role-Playing	Namco Bandai Games	0.00	0.00	0.16	
8304	8306	.hack//G.U. Vol.3//Redemption	PS2	2007.0	Role-Playing	Namco Bandai Games	0.00	0.00	0.17	
...	...	...	...	...	...	...	...	...	...	
627	628	uDraw Studio	Wii	2010.0	Misc	THQ	1.67	0.58	0.00	
7835	7837	uDraw Studio: Instant Artist	Wii	2011.0	Misc	THQ	0.08	0.09	0.00	
15523	15526	uDraw Studio: Instant Artist	X360	2011.0	Misc	THQ	0.01	0.01	0.00	
470	471	wwe Smackdown vs. Raw 2006	PS2	0.0	Fighting	NA	1.57	1.02	0.00	
9135	9137	¡Shin Chan Flipa en colores!	DS	2007.0	Platform	505 Games	0.00	0.00	0.14	

16598 rows × 11 columns

Aggregation:

```
In [26]:   #Total of global sales
           data['Global_Sales'].sum()
```

Out[26]:   8920.44

```
In [27]:   #Average of global Sales
           data['Global_Sales'].mean()
```

Out[27]:   0.5374406555006628

```
In [28]:   #Max of Global Sales
           data['Global_Sales'].max()
```

Out[28]:   82.74

```
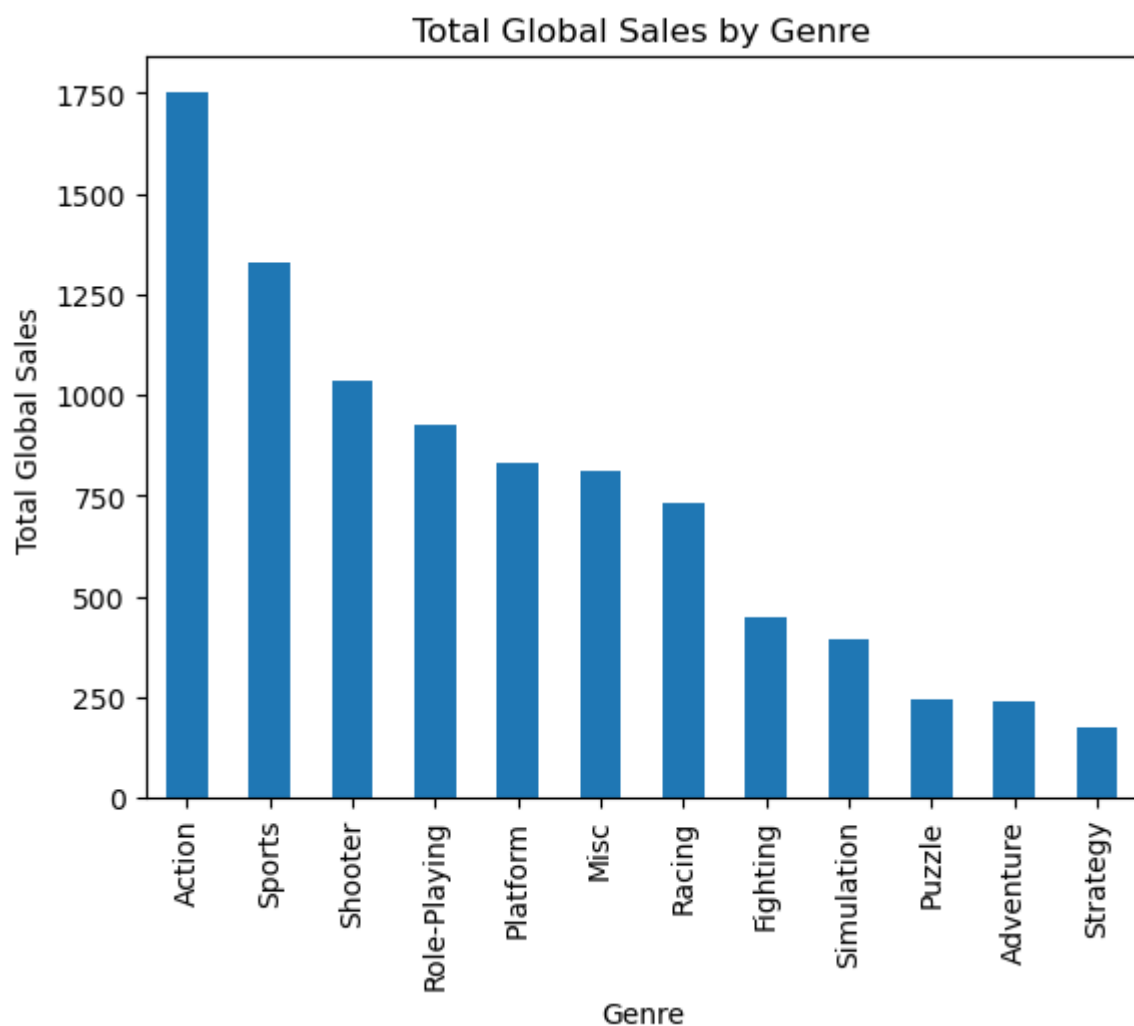In [29]:  data.groupby('Genre')['Global_Sales'].sum()

Out[29]:  Genre
          Action          1751.18
          Adventure        239.04
          Fighting         448.91
          Misc             809.96
          Platform         831.37
          Puzzle           244.95
          Racing           732.04
          Role-Playing     927.37
          Shooter         1037.37
          Simulation       392.20
          Sports          1330.93
          Strategy         175.12
          Name: Global_Sales, dtype: float64
```

Data Visualization:

```python
# Bar plot
import matplotlib.pyplot as plt

total_sales_by_genre = data.groupby('Genre')['Global_Sales'].sum().sort_values(ascend
total_sales_by_genre.plot(kind='bar')
plt.xlabel('Genre')
plt.ylabel('Total Global Sales')
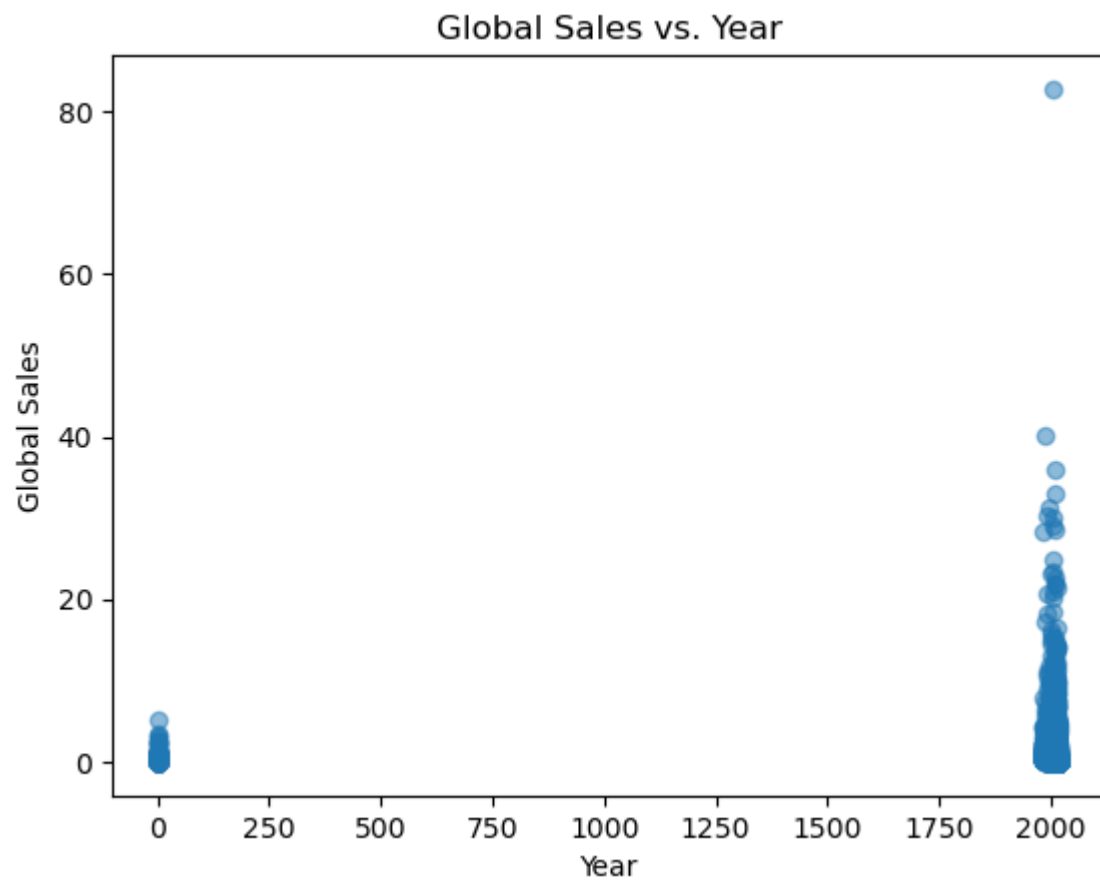plt.title('Total Global Sales by Genre')
plt.show()
```

```python
# Pie Chart
region_sales = data[['NA_Sales', 'EU_Sales', 'JP_Sales', 'Other_Sales']].sum()
region_sales.plot(kind='pie', autopct='%1.1f%%')
plt.title('Sales Distribution by Region')
plt.show()
```

Sales Distribution by Region
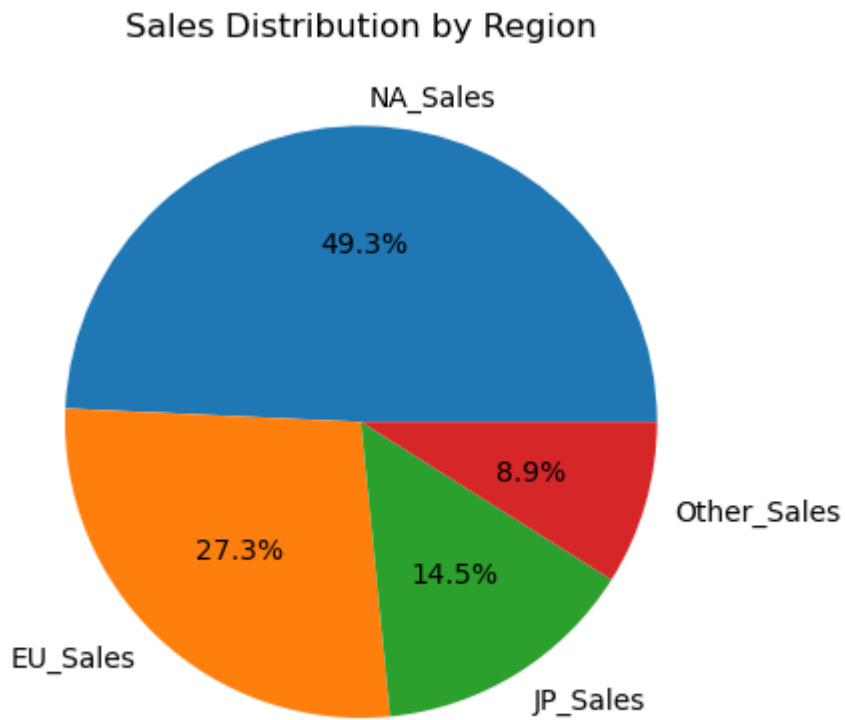
```
# Line plot
yearly_sales = data.groupby('Year')['Global_Sales'].sum()
yearly_sales.plot(kind='line', marker='o')
plt.xlabel('Year')
plt.ylabel('Total Global Sales')
plt.title('Yearly Total Global Sales')
plt.show()
```
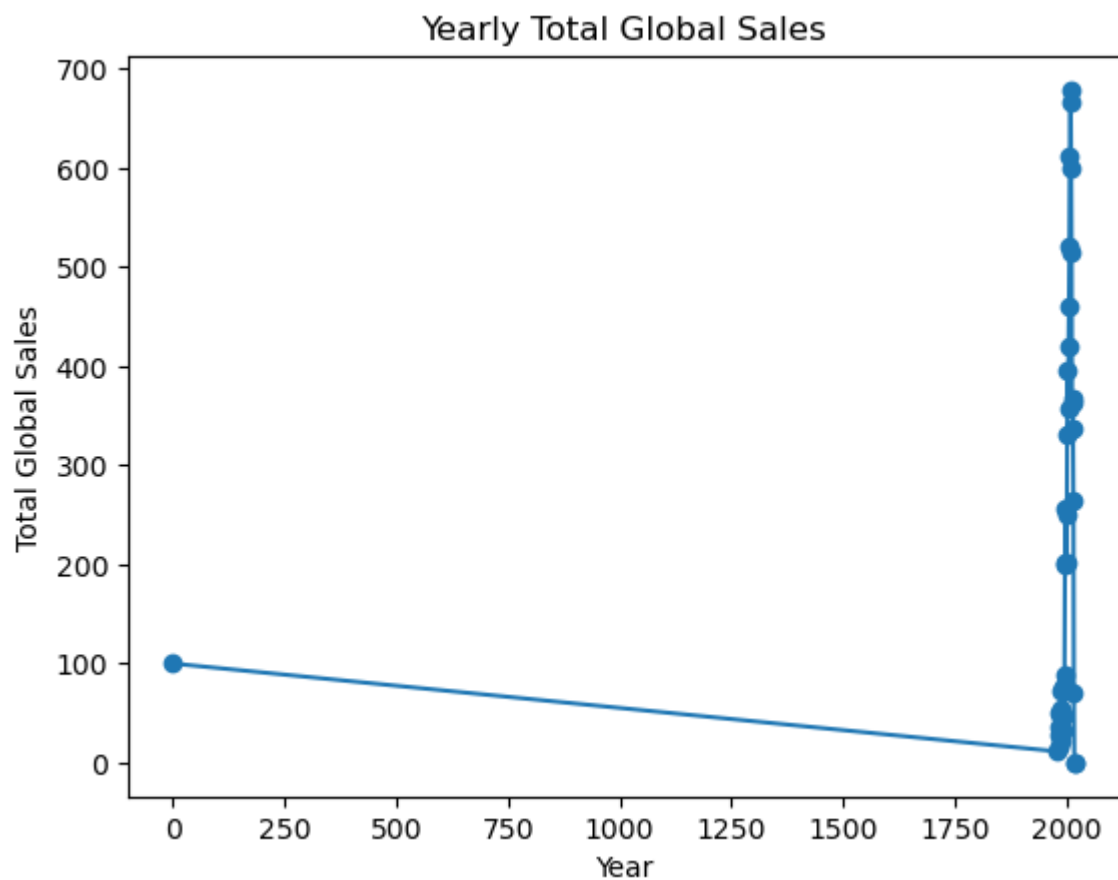
In [33]:
```python
# Scatter Plot
plt.scatter(data['Year'], data['Global_Sales'], alpha=0.5)
plt.xlabel('Year')
plt.ylabel('Global Sales')
plt.title('Global Sales vs. Year')
plt.show()
```


Global Sales vs. Year

In [ ]: