

Video Games Sales Analysis by Bayan AlArifi

This report explores a dataset generated by a scrape of vgchartz.com. The scraping script is available at <https://github.com/GregorUT/vgchartzScrape> (<https://github.com/GregorUT/vgchartzScrape>). The dataset contains video games sales and attributes for approximately 11493 video games. The dataset contains 16,598 observations and 11 variables.

These variables are:

```
## [1] "Rank"          "Name"          "Platform"       "Year"
## [5] "Genre"         "Publisher"      "NA_Sales"      "EU_Sales"
## [9] "JP_Sales"      "Other_Sales"    "Global_Sales"
```

A summary of various model fitting functions' results for each of the variables/features:

```
##      Rank                               Name          Platform
## Min.   : 1   Need for Speed: Most Wanted: 12   DS   :2163
## 1st Qu.: 4151  FIFA 14                      : 9   PS2  :2161
## Median : 8300 LEGO Marvel Super Heroes     : 9   PS3  :1329
## Mean   : 8301 Madden NFL 07                  : 9   Wii   :1325
## 3rd Qu.:12450 Ratatouille                   : 9   X360 :1265
## Max.   :16600 Angry Birds Star Wars        : 8   PSP   :1213
##                   (Other)                    :16542  (Other):7142
##      Year                               Genre          Publisher
## 2009   :1431   Action          :3316  Electronic Arts      : 1351
## 2008   :1428   Sports          :2346   Activision        :  975
## 2010   :1259   Misc            :1739   Namco Bandai Games  :  932
## 2007   :1202   Role-Playing:1488  Ubisoft          :  921
## 2011   :1139   Shooter         :1310   Konami Digital Entertainment:  832
## 2006   :1008   Adventure       :1286   THQ              :  715
## (Other):9131 (Other)          :5113   (Other)          :10872
##      NA_Sales      EU_Sales      JP_Sales      Other_Sales
## Min.   : 0.0000  Min.   : 0.0000  Min.   : 0.00000  Min.   : 0.00000
## 1st Qu.: 0.0000  1st Qu.: 0.0000  1st Qu.: 0.00000  1st Qu.: 0.00000
## Median : 0.0800  Median : 0.0200  Median : 0.00000  Median : 0.01000
## Mean   : 0.2647  Mean   : 0.1467  Mean   : 0.07778  Mean   : 0.04806
## 3rd Qu.: 0.2400  3rd Qu.: 0.1100  3rd Qu.: 0.04000  3rd Qu.: 0.04000
## Max.   :41.4900  Max.   :29.0200  Max.   :10.22000  Max.   :10.57000
##
##      Global_Sales
## Min.   : 0.0100
## 1st Qu.: 0.0600
## Median : 0.1700
## Mean   : 0.5374
## 3rd Qu.: 0.4700
## Max.   :82.7400
##
```

Checking the first couple of rows..

##	Rank	Name	Platform	Year	Genre	Publisher
## 1	1	Wii Sports	Wii	2006	Sports	Nintendo
## 2	2	Super Mario Bros.	NES	1985	Platform	Nintendo
## 3	3	Mario Kart Wii	Wii	2008	Racing	Nintendo
## 4	4	Wii Sports Resort	Wii	2009	Sports	Nintendo
## 5	5	Pokemon Red/Pokemon Blue	GB	1996	Role-Playing	Nintendo
## 6	6	Tetris	GB	1989	Puzzle	Nintendo
##		NA_Sales	EU_Sales	JP_Sales	Other_Sales	Global_Sales
## 1		41.49	29.02	3.77	8.46	82.74
## 2		29.08	3.58	6.81	0.77	40.24
## 3		15.85	12.88	3.79	3.31	35.82
## 4		15.75	11.01	3.28	2.96	33.00
## 5		11.27	8.89	10.22	1.00	31.37
## 6		23.20	2.26	4.22	0.58	30.26

Univariate Plots Section

The feature/variable Rank is the rank of the 16327 video games in the dataset considering their global sales, where rank #1 is the top selling. Thus, there was no need to plot it here.

Global Sales

Since 1980, video games global sales reached a total of 8920.44 million.

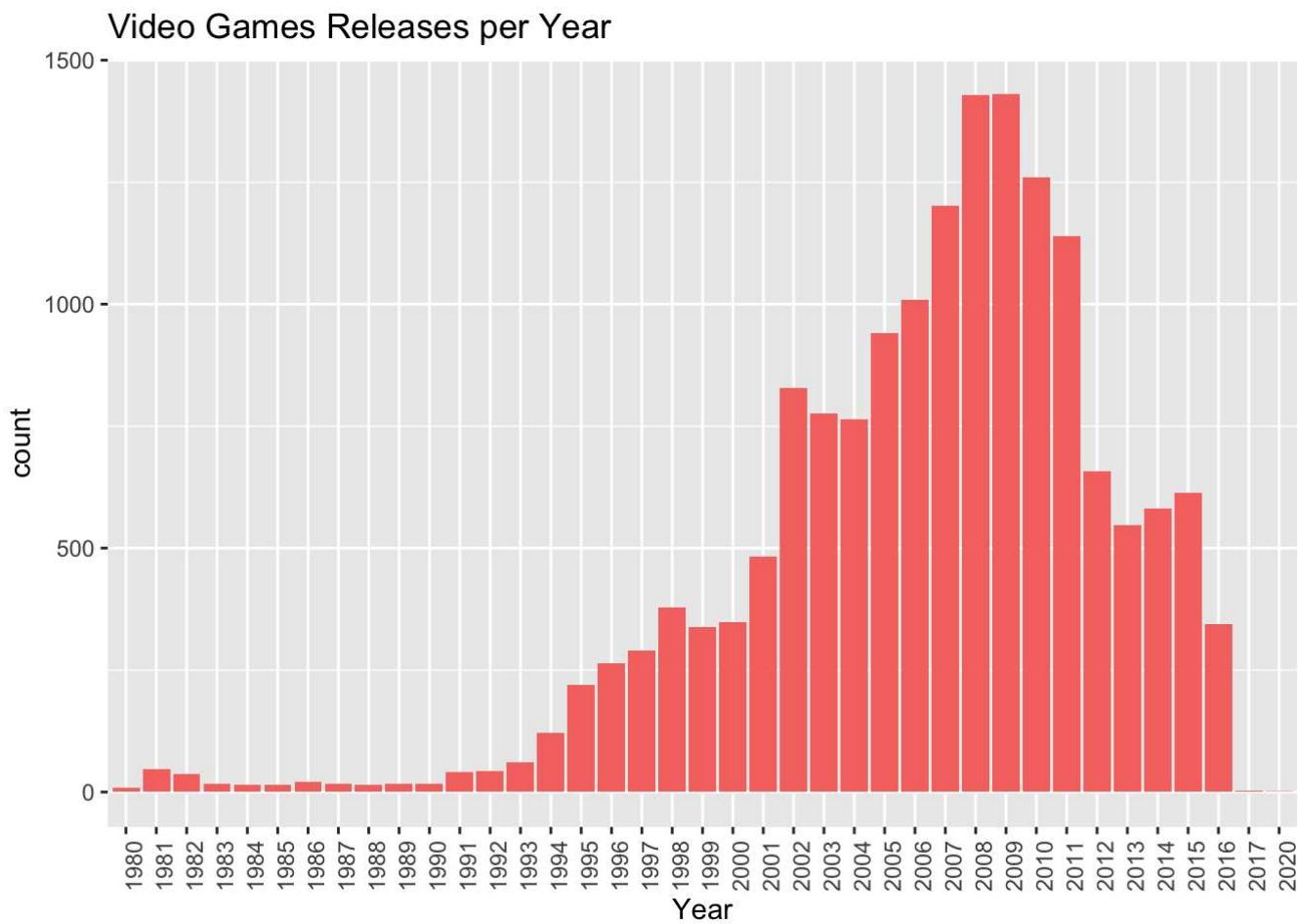
```
##      Min. 1st Qu. Median   Mean 3rd Qu.   Max.
## 0.0100  0.0600  0.1700  0.5374  0.4700 82.7400
```

```
## [1] 8920.44
```

Yearly Releases

```
## 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994
##    9   46   36   17   14   14   21   16   15   17   16   41   43   60   121
## 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
## 219  263  289  379  338  349  482  829  775  763  941 1008 1202 1428 1431
## 2010 2011 2012 2013 2014 2015 2016 2017 2020 N/A
## 1259 1139  657  546  582  614  344     3     1     0
```

Most video games were released in 2008 (1428 games) and 2009 (1431 games).



Video Games Releases

```
##          Need for Speed: Most Wanted
##                                12
##          FIFA 14
##                                9
##          LEGO Marvel Super Heroes
##                                9
##          Ratatouille
##                                9
##          Angry Birds Star Wars
##                                8
##          Cars
##                                8
##          FIFA 15
##                                8
##          FIFA Soccer 13
##                                8
##          Lego Batman 3: Beyond Gotham
##                                8
##          LEGO Jurassic World
##                                8
##          LEGO Star Wars II: The Original Trilogy
##                                8
##          LEGO The Hobbit
##                                8
##          Madden NFL 07
##                                8
##          Madden NFL 08
##                                8
##          Monopoly
##                                8
##          Terraria
##                                8
##          The LEGO Movie Videogame
##                                8
##          FIFA 12
##                                7
##          FIFA Soccer 08
##                                7
##          FIFA Soccer 10
##                                7
##          FIFA Soccer 11
##                                7
##          Harry Potter and the Half-Blood Prince
##                                7
##          Harry Potter and the Order of the Phoenix
##                                7
##          Harry Potter and the Sorcerer's Stone
##                                7
##          LEGO Batman 2: DC Super Heroes
##                                7
##          LEGO Marvel's Avengers
##                                7
##          LEGO Pirates of the Caribbean: The Video Game
##                                7
##          LEGO Star Wars III: The Clone Wars
```

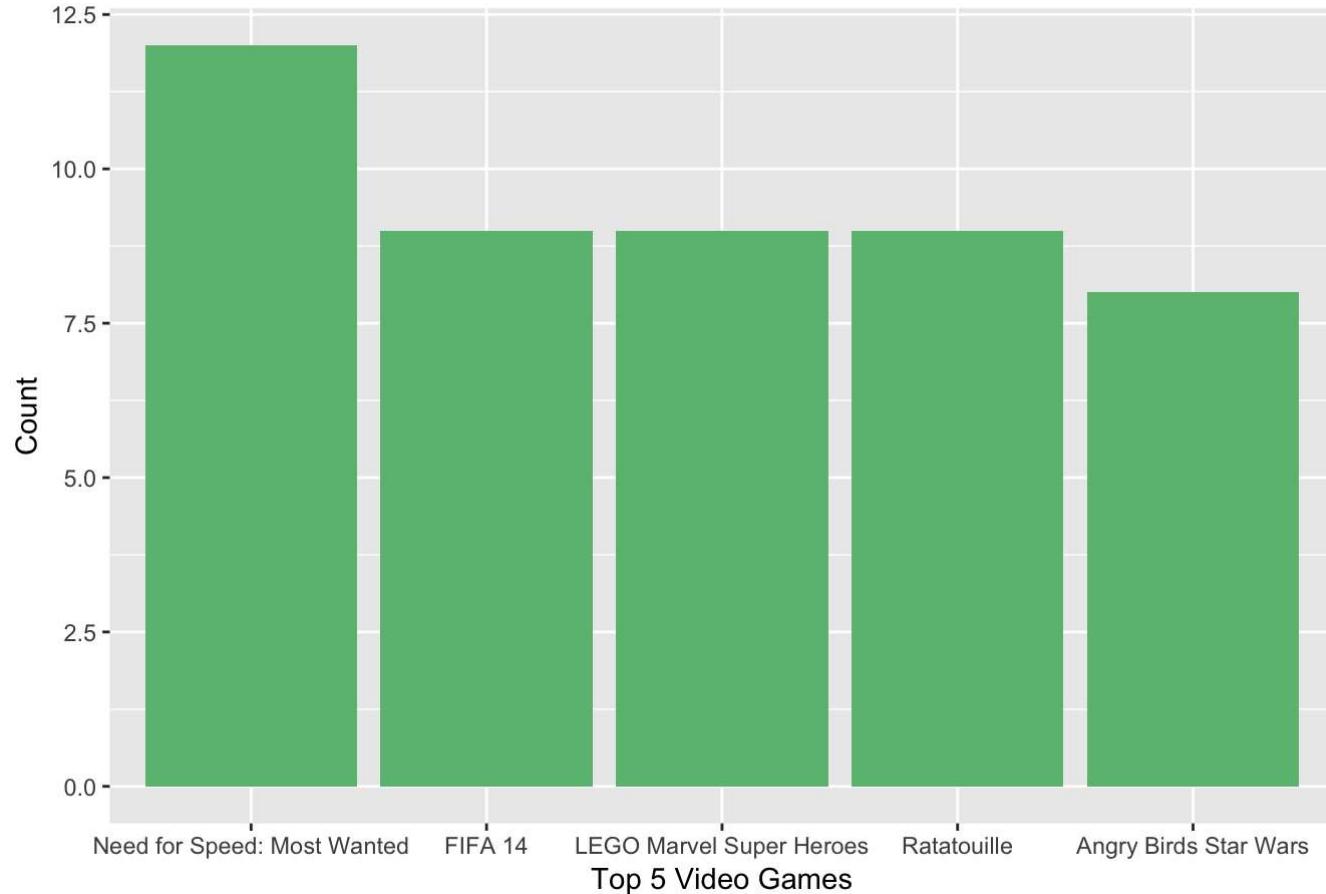
```
##                                     7
##             Lego Star Wars: The Force Awakens
##                                     7
##             LEGO The Lord of the Rings
##                                     7
##             Major League Baseball 2K11
##                                     7
##             NBA Jam
##                                     7
##             Need for Speed Carbon
##                                     7
##             Need for Speed: ProStreet
##                                     7
##             Need For Speed: Undercover
##                                     7
##             Pro Evolution Soccer 2012
##                                     7
##             Skylanders SWAP Force
##                                     7
##             Skylanders: SuperChargers
##                                     7
##             Skylanders: Trap Team
##                                     7
##             Spider-Man 3
##                                     7
##             Star Wars The Clone Wars: Republic Heroes
##                                     7
##             Surf's Up
##                                     7
##             The Amazing Spider-Man 2 (2014)
##                                     7
##             The Sims 2
##                                     7
##             Tomb Raider: Legend
##                                     7
##             Wall-E
##                                     7
##             007: Quantum of Solace
##                                     6
##             Adventure Time: Finn & Jake Investigations
##                                     6
##             Assassin's Creed IV: Black Flag
##                                     6
##             Avatar: The Game
##                                     6
##             Ben 10 Galactic Racing
##                                     6
##             Ben 10 Ultimate Alien: Cosmic Destruction
##                                     6
##             Brunswick Pro Bowling
##                                     6
##             Call of Duty: Ghosts
##                                     6
##             Cars 2
##                                     6
##             Cars: Race-O-Rama
```

```
##                                     6
##                                     Darksiders II
##                                     6
##                                     DiRT 2
##                                     6
##                                     Disney Infinity
##                                     6
##                                     Disney Infinity 2.0: Marvel Super Heroes
##                                     6
##                                     FIFA Soccer 07
##                                     6
##                                     FIFA Soccer 09
##                                     6
##                                     FIFA World Cup Germany 2006
##                                     6
##                                     G-Force
##                                     6
##                                     G.I. Joe: The Rise of Cobra
##                                     6
##                                     Ghostbusters: The Video Game
##                                     6
##                                     Harry Potter and the Chamber of Secrets
##                                     6
##                                     Harry Potter and the Goblet of Fire
##                                     6
##                                     Ice Age 2: The Meltdown
##                                     6
##                                     Ice Age: Dawn of the Dinosaurs
##                                     6
##                                     Iron Man
##                                     6
##                                     Juiced 2: Hot Import Nights
##                                     6
##                                     Just Dance 2014
##                                     6
##                                     Just Dance 2015
##                                     6
##                                     Just Dance 2016
##                                     6
##                                     Kung Fu Panda
##                                     6
##                                     LEGO Harry Potter: Years 1-4
##                                     6
##                                     LEGO Indiana Jones 2: The Adventure Continues
##                                     6
##                                     LEGO Indiana Jones: The Original Adventures
##                                     6
##                                     Madagascar: Escape 2 Africa
##                                     6
##                                     Madden NFL 06
##                                     6
##                                     Madden NFL 09
##                                     6
##                                     Madden NFL 13
##                                     6
##                                     Major League Baseball 2K10
```

##	6
## Major League Baseball 2K12	6
##	6
## Marvel: Ultimate Alliance	6
##	6
## Marvel: Ultimate Alliance 2	6
##	6
## Michael Jackson: The Experience	6
##	6
## Minecraft	6
##	6
## Monsters vs. Aliens	6
##	6
## MX vs. ATV Untamed	6
##	6
## NBA 2K11	6
##	6
## Need for Speed Underground 2	6
##	6
## Open Season	6
##	6
## Peter Jackson's King Kong: The Official Game of the Movie	6
##	6
## Pirates of the Caribbean: At World's End	6
##	6
## Prince of Persia: The Forgotten Sands	6
##	6
## Pro Evolution Soccer 2008	6
##	6
## Pro Evolution Soccer 2010	6
##	6
## (Other)	15663

The top released video game is 'Need for Speed: Most Wanted'.

Top 5 Released Video Games

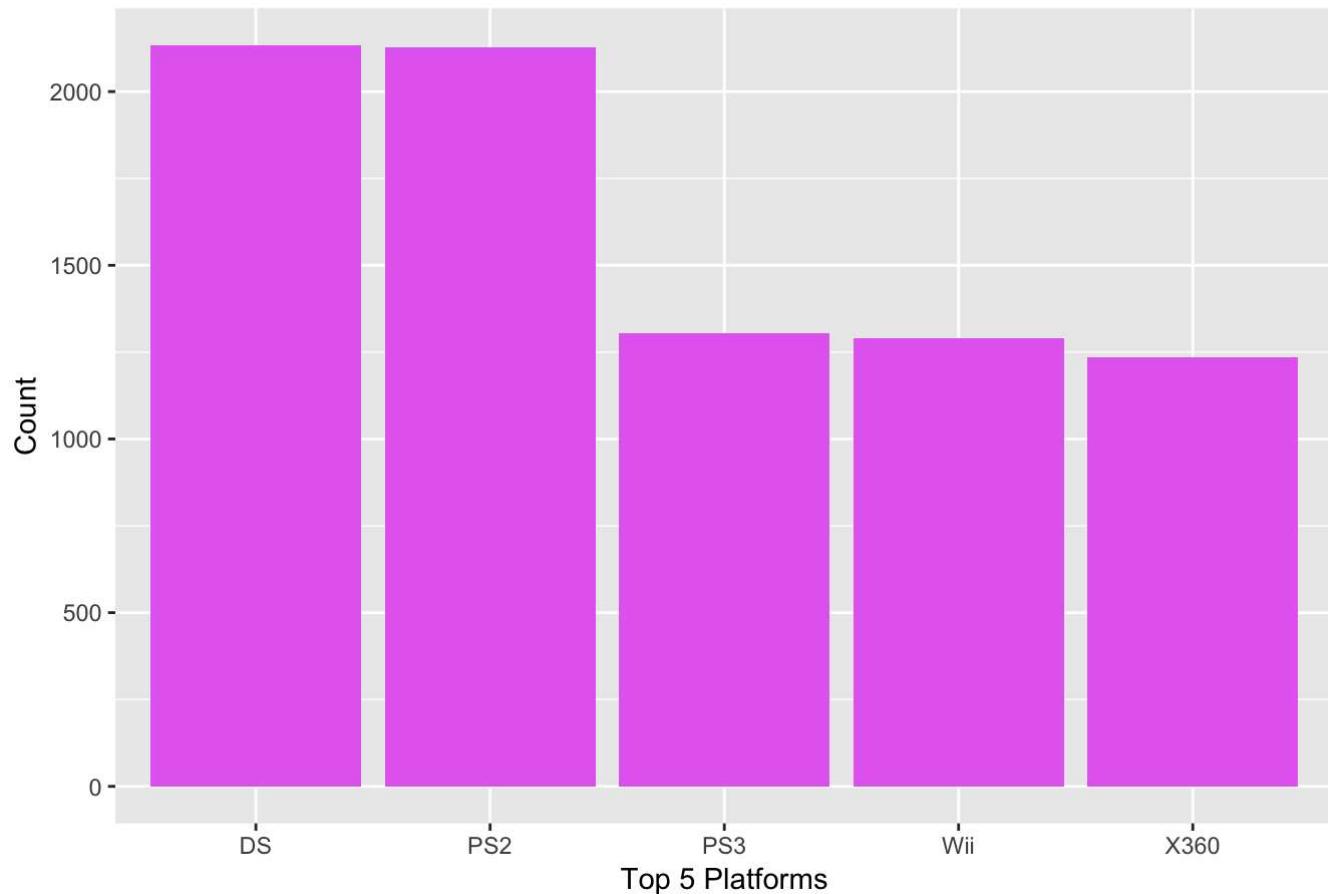


Platforms

```
## 2600 3DO 3DS DC DS GB GBA GC GEN GG N64 NES NG PC PCFX
## 116   3 500 52 2133 97 811 542 27 1 316 98 12 943 1
## PS  PS2 PS3 PS4 PSP PSV SAT SCD SNES TG16 Wii WiiU WS X360 XB
## 1189 2127 1304 336 1197 412 173   6 239   2 1290 143 6 1235 803
## XOne
## 213
```

The top releasing video game platforms are PS2 (2127) and DS (2133), out of 31 total platforms.

Top 5 Releasing Platforms



Publishers

```
##          Electronic Arts
##                      1339
##          Activision
##                      966
##          Namco Bandai Games
##                      928
##          Ubisoft
##                      918
##          Konami Digital Entertainment
##                      823
##          THQ
##                      712
##          Nintendo
##                      696
##          Sony Computer Entertainment
##                      682
##          Sega
##                      632
##          Take-Two Interactive
##                      412
##          Capcom
##                      376
##          Atari
##                      347
##          Tecmo Koei
##                      338
##          Square Enix
##                      231
## Warner Bros. Interactive Entertainment
##                      217
##          Disney Interactive Studios
##                      214
##          Eidos Interactive
##                      196
##          Midway Games
##                      196
##          505 Games
##                      192
##          Microsoft Game Studios
##                      189
##          Acclaim Entertainment
##                      184
##          D3Publisher
##                      183
##          Vivendi Games
##                      161
##          Codemasters
##                      150
##          Idea Factory
##                      128
##          Deep Silver
##                      121
##          Nippon Ichi Software
##                      104
##          Zoo Digital Publishing
```

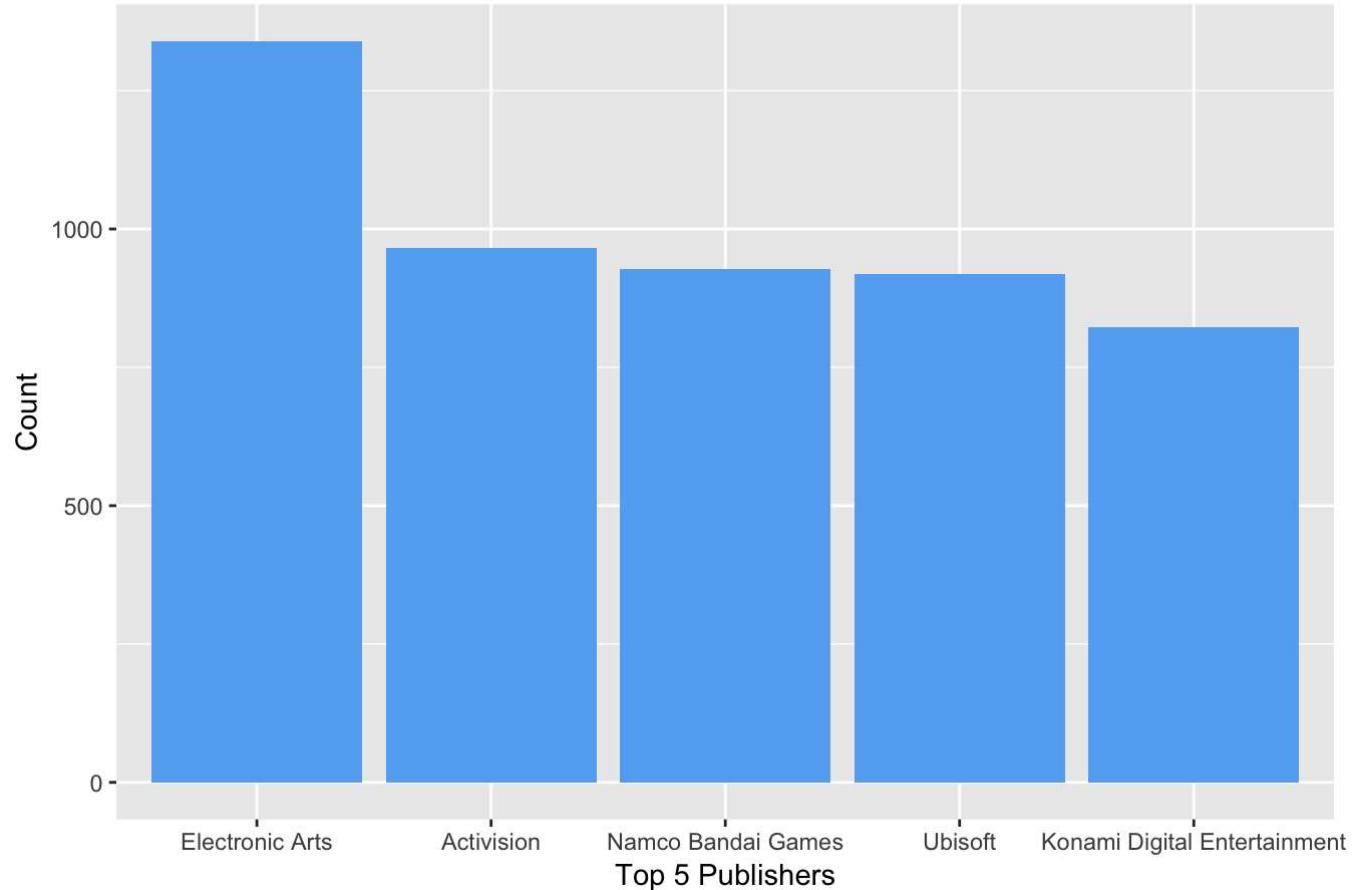
```
##          104
##          Unknown
##          100
## Majesco Entertainment
##          90
##          LucasArts
##          89
## Rising Star Games
##          85
## Hudson Soft
##          81
## Banpresto
##          73
## Crave Entertainment
##          71
## Bethesda Softworks
##          69
##          Atlus
##          67
## Virgin Interactive
##          62
##          5pb
##          61
## Infogrames
##          61
## Ignition Entertainment
##          59
## Focus Home Interactive
##          56
## Marvelous Interactive
##          56
## SquareSoft
##          52
## Empire Interactive
##          51
## Kadokawa Shoten
##          50
## Destineer
##          45
## GT Interactive
##          45
## DTP Entertainment
##          44
## Alchemist
##          43
## MTV Games
##          40
## Global Star
##          39
## PQube
##          39
## SouthPeak Games
##          37
## Spike
##          37
## Takara Tomy
```

```
## 37
## 3D0
## 36
## N/A
## 36
## TDK Mediactive
## 36
## BAM! Entertainment
## 35
## Nordic Games
## 35
## Zoo Games
## 33
## Game Factory
## 32
## Mindscape
## 32
## Psygnosis
## 32
## Black Bean Games
## 30
## Enix Corporation
## 30
## Interplay
## 30
## Activision Value
## 29
## FuRyu
## 27
## Level 5
## 27
## Prototype
## 27
## Arc System Works
## 26
## Kalypso Media
## 26
## Little Orbit
## 26
## Avanquest
## 25
## Telltale Games
## 25
## Midas Interactive Entertainment
## 24
## Aqua Plus
## 23
## Jaleco
## 23
## Paradox Interactive
## 23
## Broccoli
## 22
## JoWood Productions
## 22
## SNK
```

```
##          22
##          Universal Interactive
##          22
##          Kemco
##          21
##          Oxygen Interactive
##          21
##          ASCII Entertainment
##          20
##          Compile Heart
##          20
##          Storm City Games
##          19
##          Success
##          19
##          Taito
##          19
##          Titus
##          19
##          ChunSoft
##          18
##          City Interactive
##          18
##          SNK Playmore
##          18
##          Tomy Corporation
##          18
##          Zushi Games
##          18
##          DreamCatcher Interactive
##          17
##          (Other)
##          1868
```

The top video games publisher is Electronic Arts (1339), out of a total of 579 publishers.

Top 5 Releasing Publishers

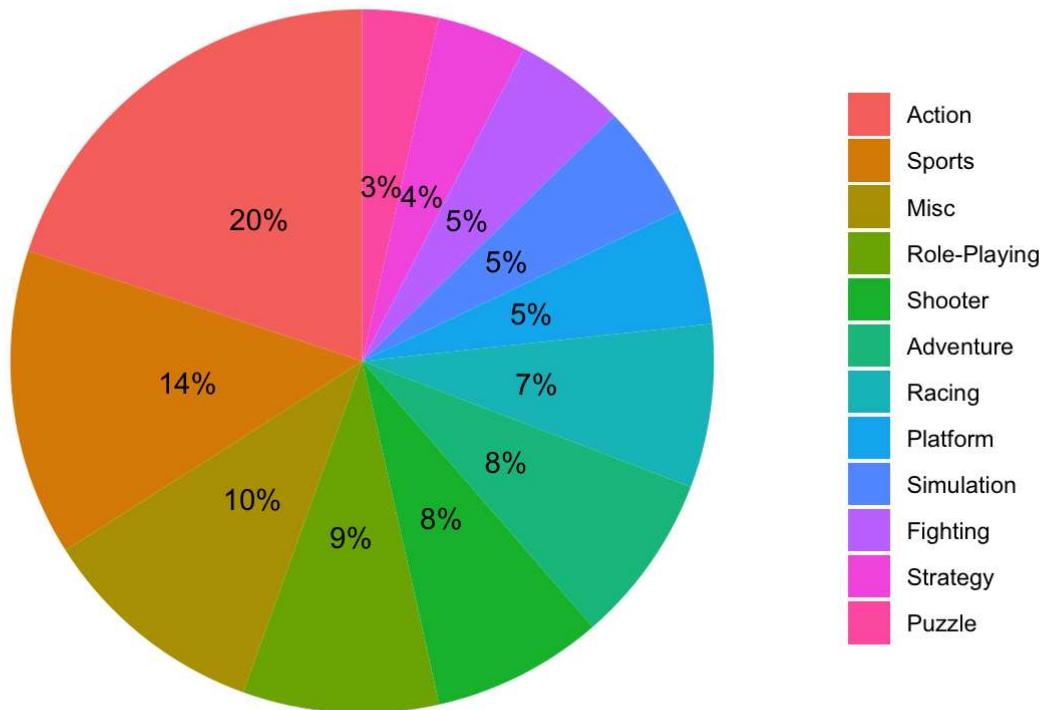


Genres

	Action	Adventure	Fighting	Misc	Platform
##	3253	1276	836	1710	876
##	Puzzle	Racing	Role-Playing	Shooter	Simulation
##	571	1226	1471	1282	851
##	Sports	Strategy			
##	2304	671			

The top selling video games genre is Action with a total of 3253 video game releases, out of a total of 12 genres. Action Games contribute to almost 20% of the games released. Sports games coming in second with 14% (2304 releases). Overall all top 5 genres contribute to 61% of the games released.

Video Games Genres



Univariate Analysis

What is the structure of your dataset?

There are 16,598 observations about 11493 video games, with 11 features, as described below.

Variables Dictionary:

- Rank - Ranking of overall sales
- Name - The game's name
- Platform - Platform of the game's release (i.e. PC, PS4, etc.)
- Year - Year of the game's release
- Genre - Genre of the game
- Publisher - Publisher of the game
- NA_Sales - Sales in North America (in millions)
- EU_Sales - Sales in Europe (in millions)
- JP_Sales - Sales in Japan (in millions)
- Other_Sales - Sales in the rest of the world (in millions)
- Global_Sales - Total worldwide sales.

```

## 'data.frame':   16327 obs. of  11 variables:
## $ Rank      : int  1 2 3 4 5 6 7 8 9 10 ...
## $ Name       : Factor w/ 11493 levels "¡Shin Chan Flipa en colores!",...: 10991 9343 5531
10993 7364 9707 6648 10989 6651 2594 ...
## $ Platform   : Factor w/ 31 levels "2600","3DO","3DS",...: 26 12 26 26 6 6 5 26 26 12 ...
## $ Year       : Factor w/ 40 levels "1980","1981",...: 27 6 29 30 17 10 27 27 30 5 ...
## $ Genre      : Factor w/ 12 levels "Action","Adventure",...: 11 5 7 11 8 6 5 4 5 9 ...
## $ Publisher  : Factor w/ 579 levels "10TACLE Studios",...: 369 369 369 369 369 369 369 36
9 369 369 ...
## $ NA_Sales   : num  41.5 29.1 15.8 15.8 11.3 ...
## $ EU_Sales   : num  29.02 3.58 12.88 11.01 8.89 ...
## $ JP_Sales   : num  3.77 6.81 3.79 3.28 10.22 ...
## $ Other_Sales: num  8.46 0.77 3.31 2.96 1 0.58 2.9 2.85 2.26 0.47 ...
## $ Global_Sales: num  82.7 40.2 35.8 33 31.4 ...

```

What is/are the main feature(s) of interest in your dataset?

The main features in the data set are Global_Sales and Year, and discovering the trend around them, i.e. what are the top globally selling value of the other features, and top other features values over time.

What other features in the dataset do you think will help support your investigation into your feature(s) of interest?

The month of the year could likely contribute to the rise of sales. For example, certain video game genres could be always popular in a certain month of the year. It would be interesting to see how the other regions around the world's sales do, rather than just having the variable Other_Sales. Lastly, demographic data on the buyers of these games could tell us a lot on why certain feature values happen to be more popular than others. In fact, such kind of data can also help us predict the future sales considering the buyers demographic and behaviour.

Did you create any new variables from existing variables in the dataset?

In order to create the regional sales comparison plots in the **Multivariate** section, I needed to combine the regional sales columns (NA_Sales, EU_Sales, JP_Sales, Other_Sales, Global_Sales) by using the gather function from the tidy package.

Of the features you investigated, were there any unusual distributions? Did you perform any operations on the data to tidy, adjust, or change the form of the data? If so, why did you do this?

I had to drop observations where the Year had an N/A value.

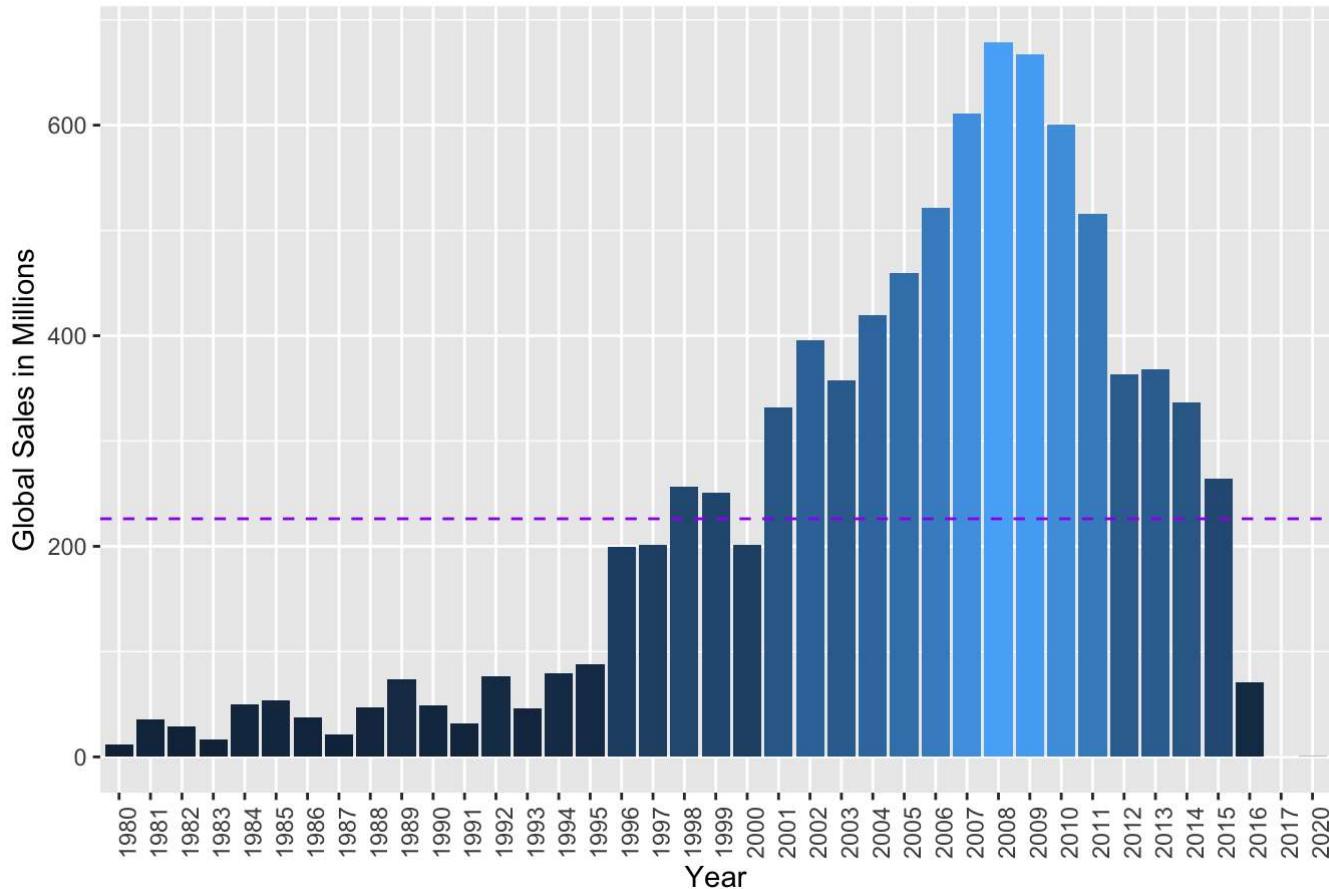
Bivariate Plots Section

Global Sales per Year

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
##      0.05   46.60 199.15 226.16 365.82 678.90
```

The highest global sales were in 2008, with a total of 678.90 million. 2009 comes in second with slightly less sales. On average, the yearly global sales reach 226.16 million as shown in the purple dashed line.

Global Sales per Year

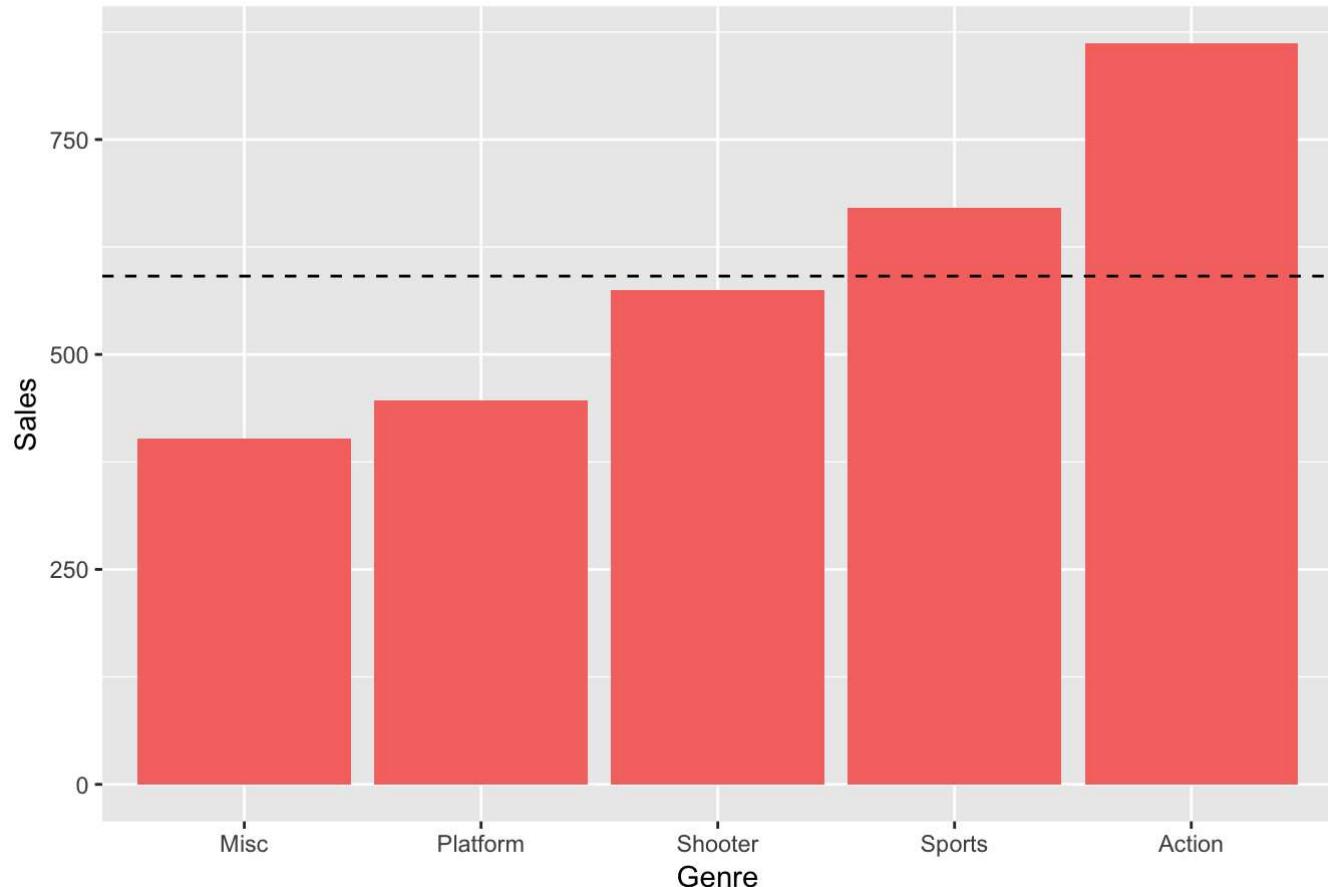


Top Globally Selling Genres

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
##      402.5   446.0  575.2  591.1  670.1  861.8
```

The top globally selling video game genre is Action with 1722.9 million. On average, the global sales reach 591.1 million as shown in the black dashed line.

Top 5 Globally Selling Genres

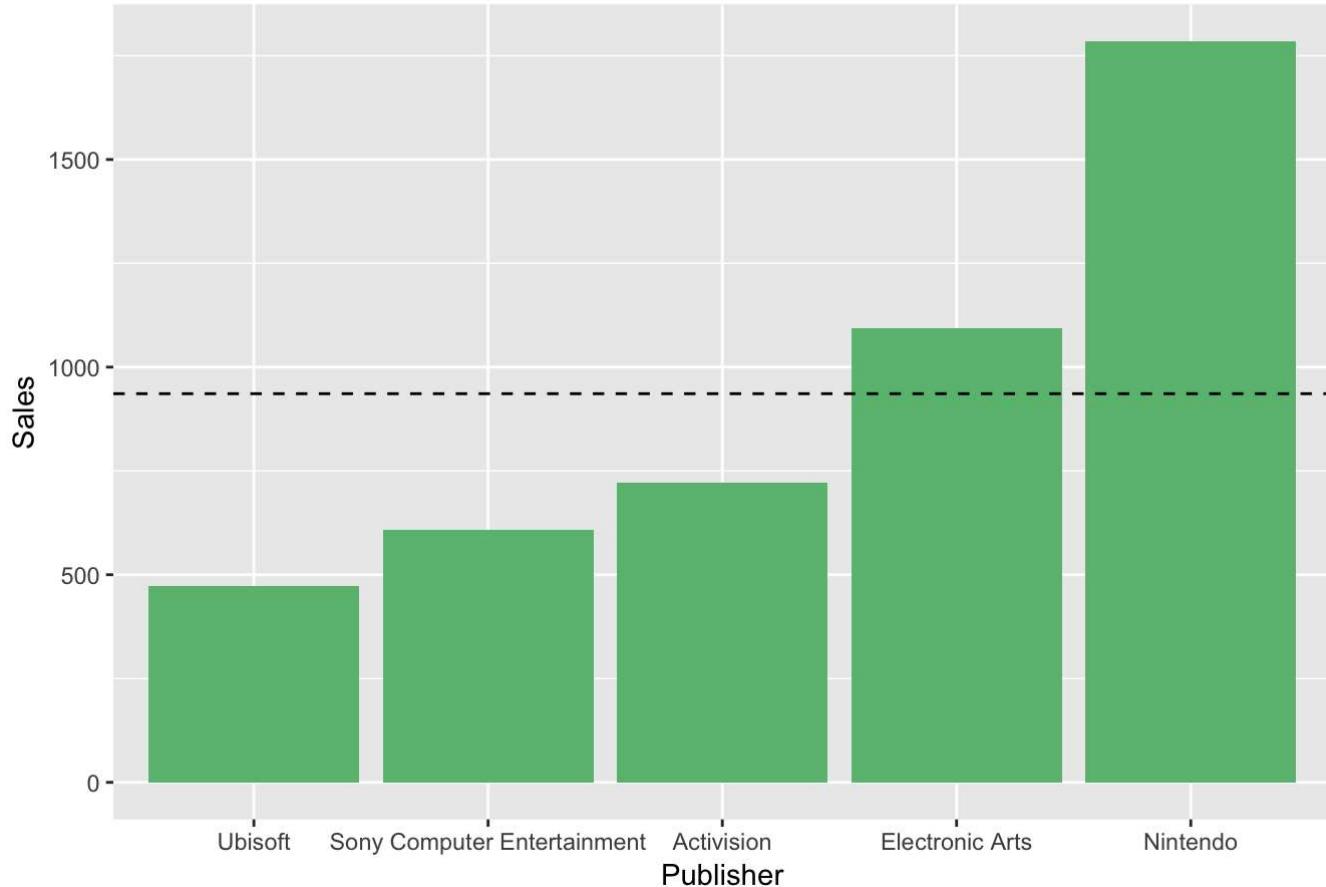


Top Globally Selling Publishers

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.  
##  473.5   607.3  721.4   936.0 1093.4 1784.4
```

The top globally selling video game publisher is Nintendo with 1784.4 million. On average, the global sales reach 936.0 million as shown in the black dashed line.

Top 5 Globally Selling Publishers

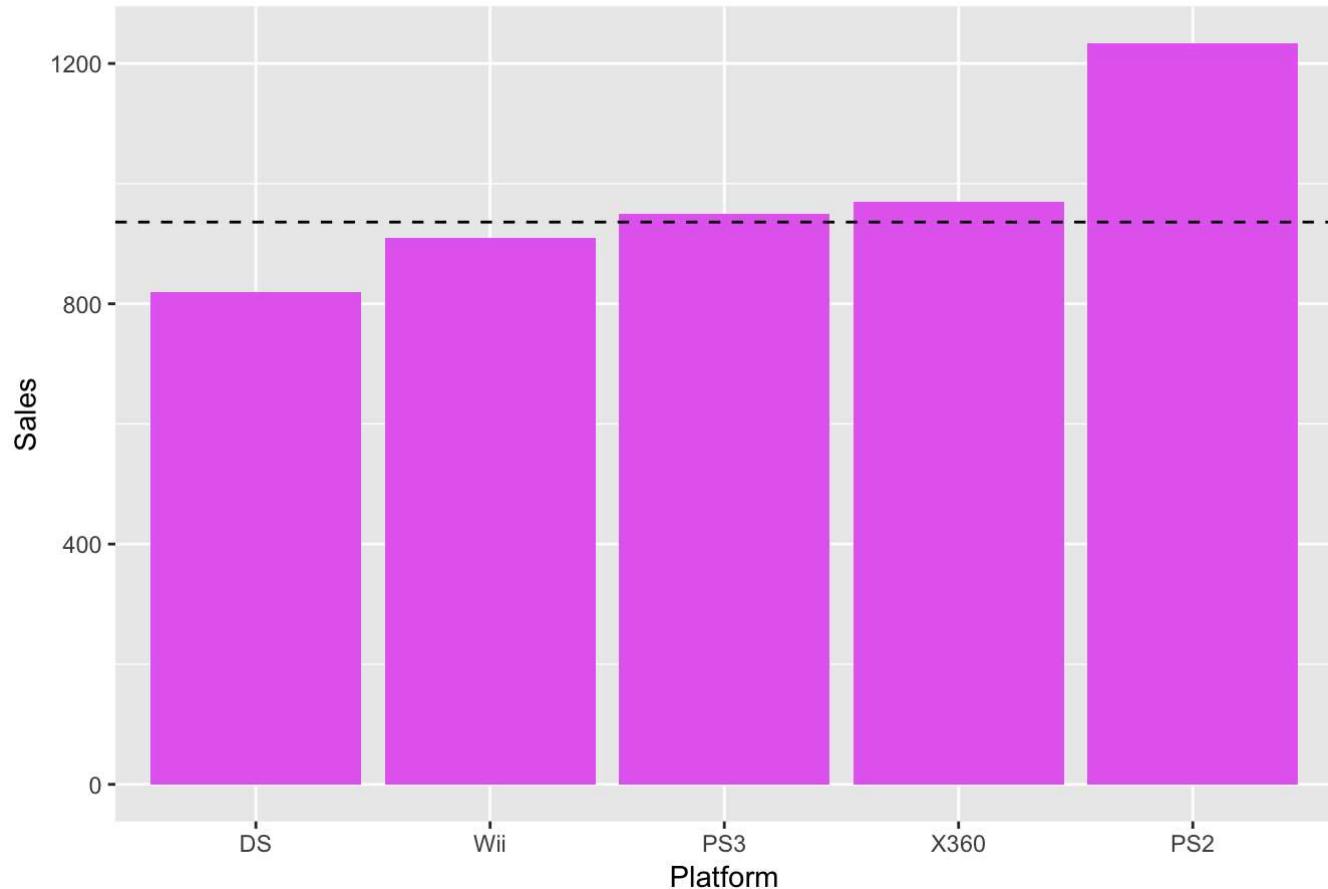


Top Globally Selling Platforms

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.  
##  819.0   909.8  949.4  976.2  969.6 1233.5
```

The top globally selling video game platforms is PS2 with 988.5 million. On average, the global sales reach 936.0 million as shown in the black dashed line.

Top 5 Globally Selling Platforms

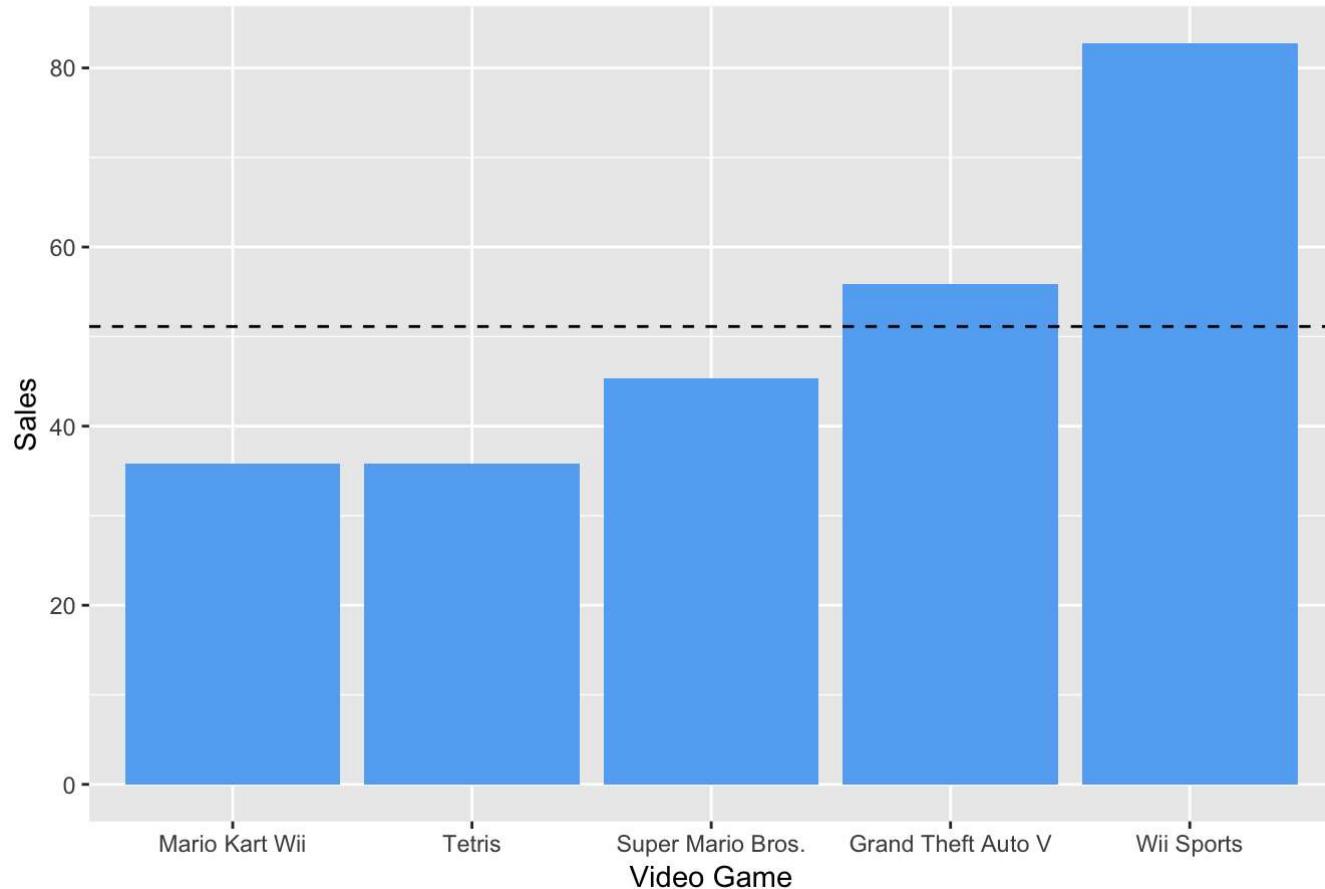


Top Globally Selling Video Games

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.  
##  35.82   35.84  45.31   51.13   55.92  82.74
```

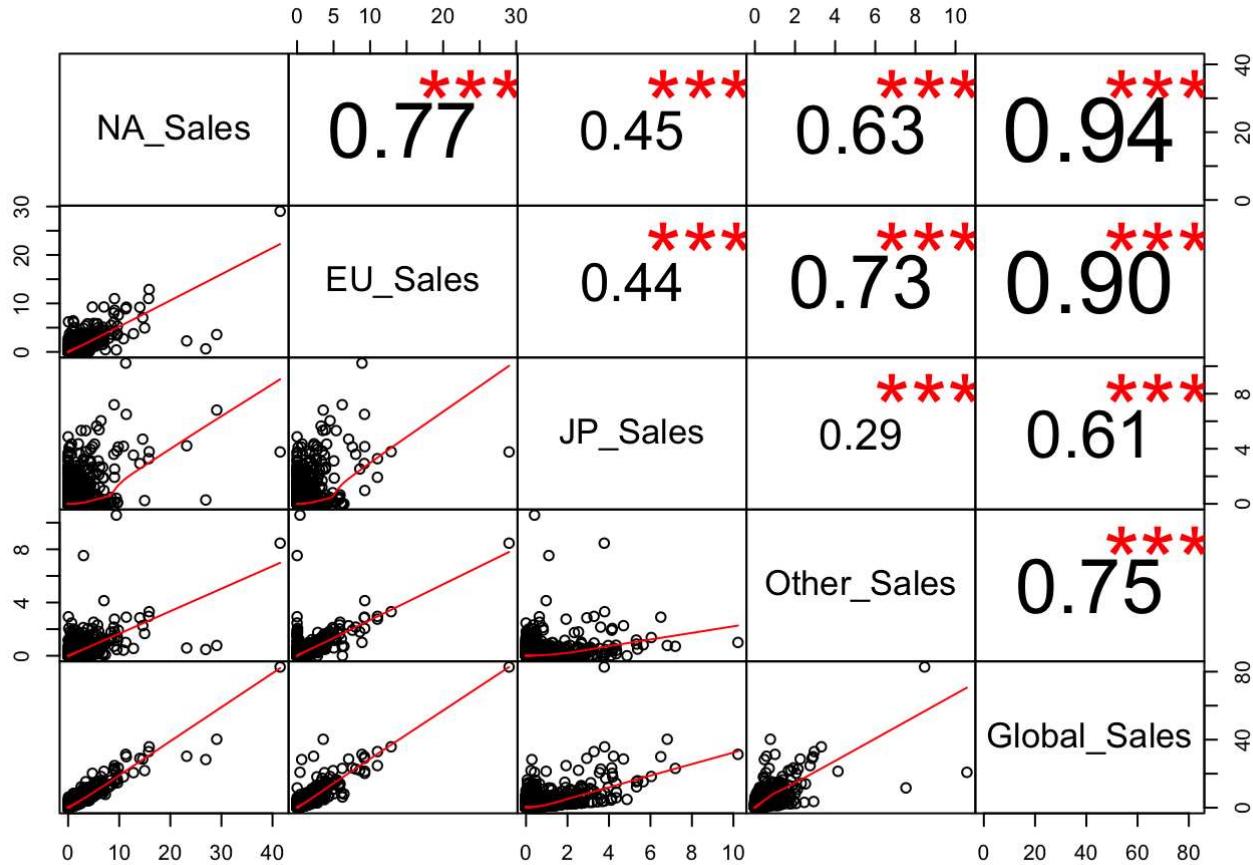
The top globally selling video game is Wii Sport with 82.74 million. On average, the global sales reach 51.13 million as shown in the black dashed line.

Top 5 Globally Selling Video Games



Regional Sales

The distribution of each regional sales variable is shown on the diagonal of the below plot. On the bottom of the diagonal, the bivariate scatter plots with a fitted line are displayed. On the top of the diagonal, the value of the correlation plus the significance level as stars. Each significance level is associated with a symbol: p-values(0, 0.001, 0.01, 0.05, 0.1, 1) <=> symbols("****", "***", "**", "*", ". ", ""). As we can see in the matrix, NA_Sales (0.94) and EU_Sales (0.90) indicate an almost perfect positive correlation with Global_Sales. Moreover, if we look into the behaviors of the NA_Sales and EU_Sales, they seem to move in the same direction. In general, all of the correlation coefficient values are greater than zero. Thus, there is a positive relationship between these variables.



Bivariate Analysis

Talk about some of the relationships you observed in this part of the investigation. How did the feature(s) of interest vary with other features in the dataset?

2008 and 2009 were the most successful years for the game community. Action games are more famous nowadays. Nintendo and PS2 are behind the highest global sales. The top globally selling video game since 1980 is Wii Sports.

Did you observe any interesting relationships between the other features (not the main feature(s) of interest)?

No, not in my bivariate analysis.

What was the strongest relationship you found?

The one explained in the correlation matrix in the regional sales section.

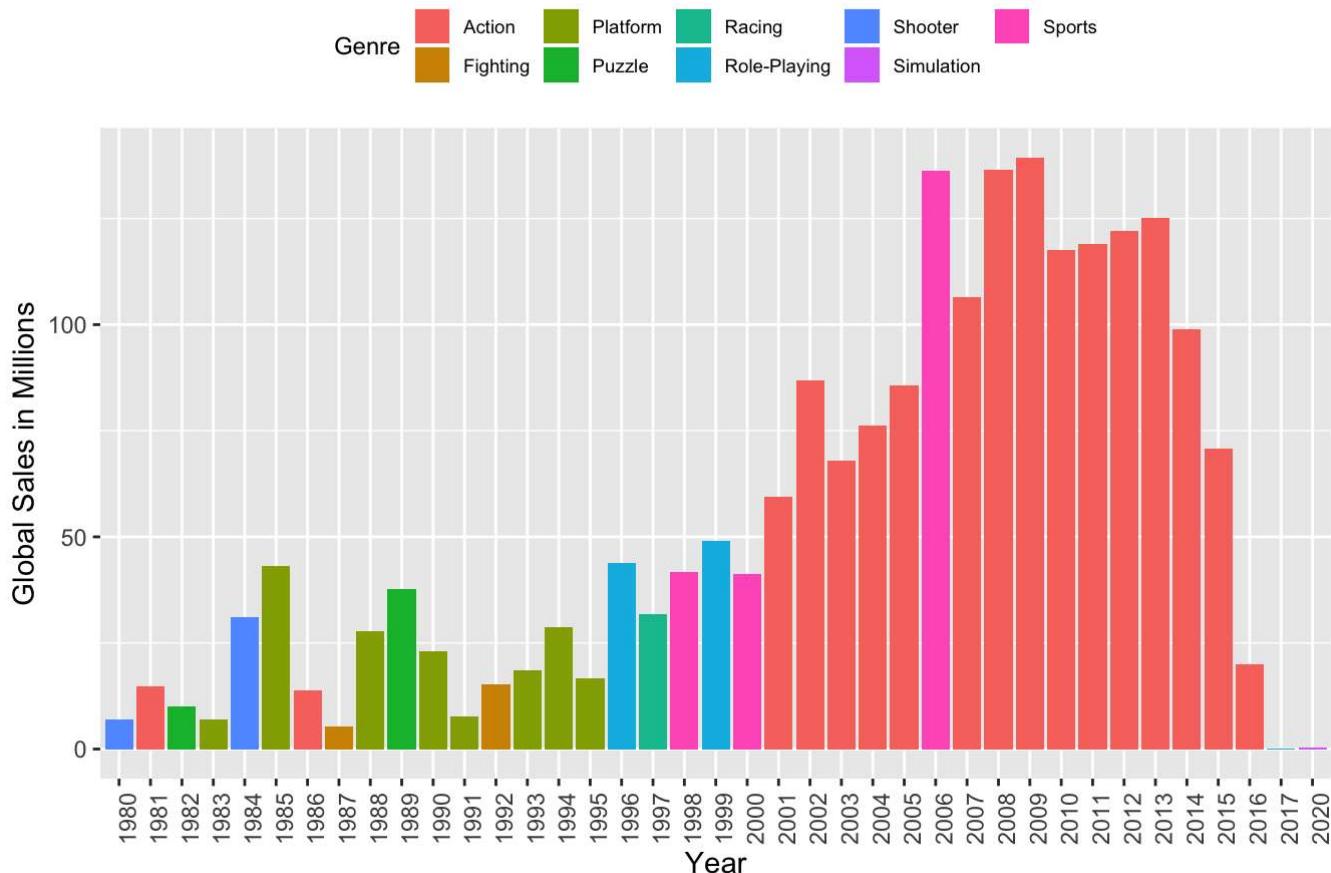
Multivariate Plots Section

Globally Selling Genres per Year

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	0.04	15.97	41.19	53.43	86.23	139.36

Action is the top globally selling genre since 1980 with 139.36 million in 2009. Sports comes second with slightly less sales in 2006. Action also happens to be the top globally selling genre in 17 years (1981, 1986, 2001-2005, 2007-2016). On a yearly average, top video game publisher sales reach 53.43 million.

Top Globally Selling Genres per Year

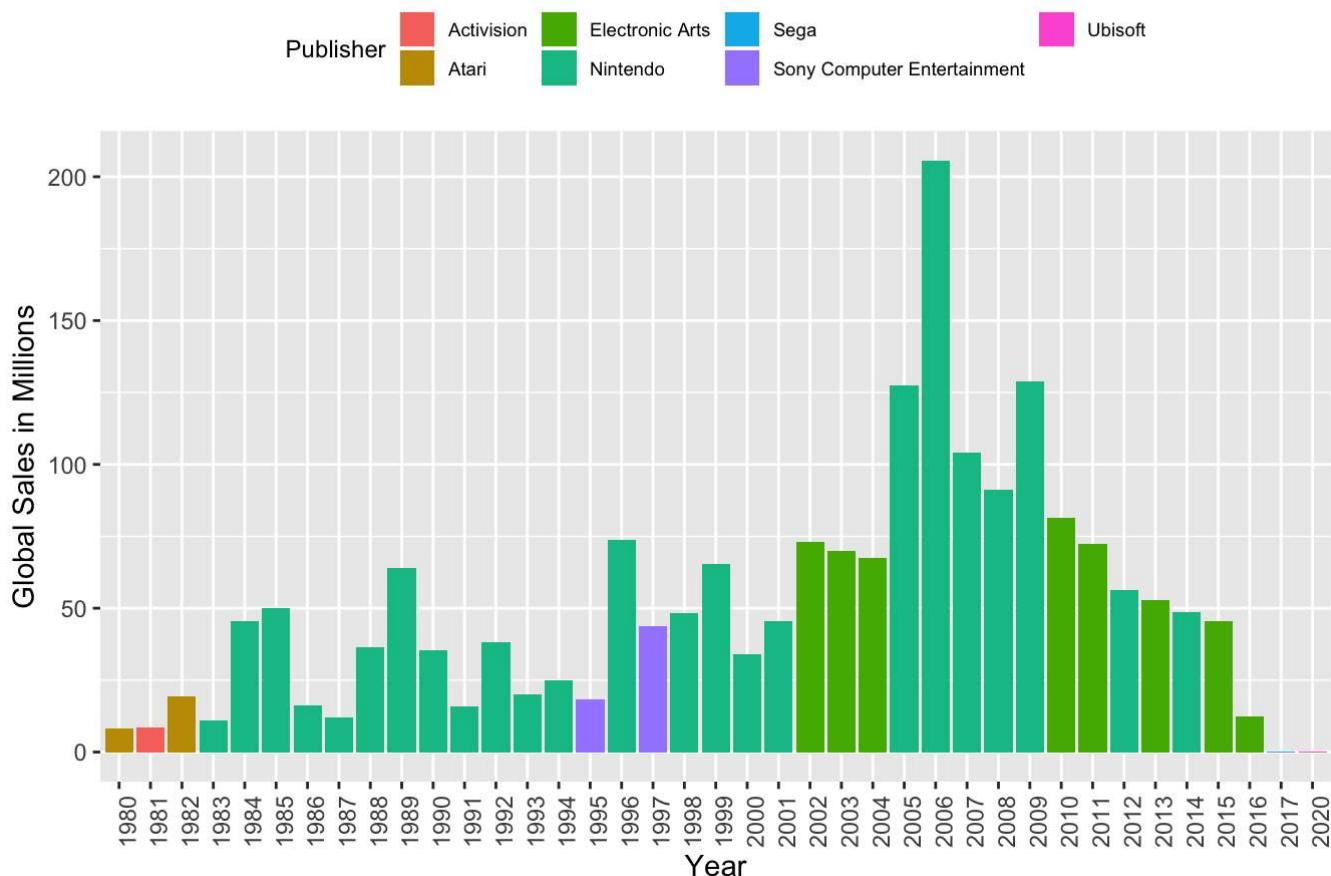


Globally Selling Publishers per Year

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	0.04	18.94	45.42	50.57	68.58	205.61

Nintendo is the top globally selling publishers since 1980 with 205.61 million in 2006. It also happens to be the top globally selling publisher in 24 years (1983-1994, 1996, 1998-2001, 2005-2009, 2012, 2014). Electronic Arts comes second. On a yearly average, top video game publisher sales reach 50.57 million.

Top Globally Selling Publishers per Year

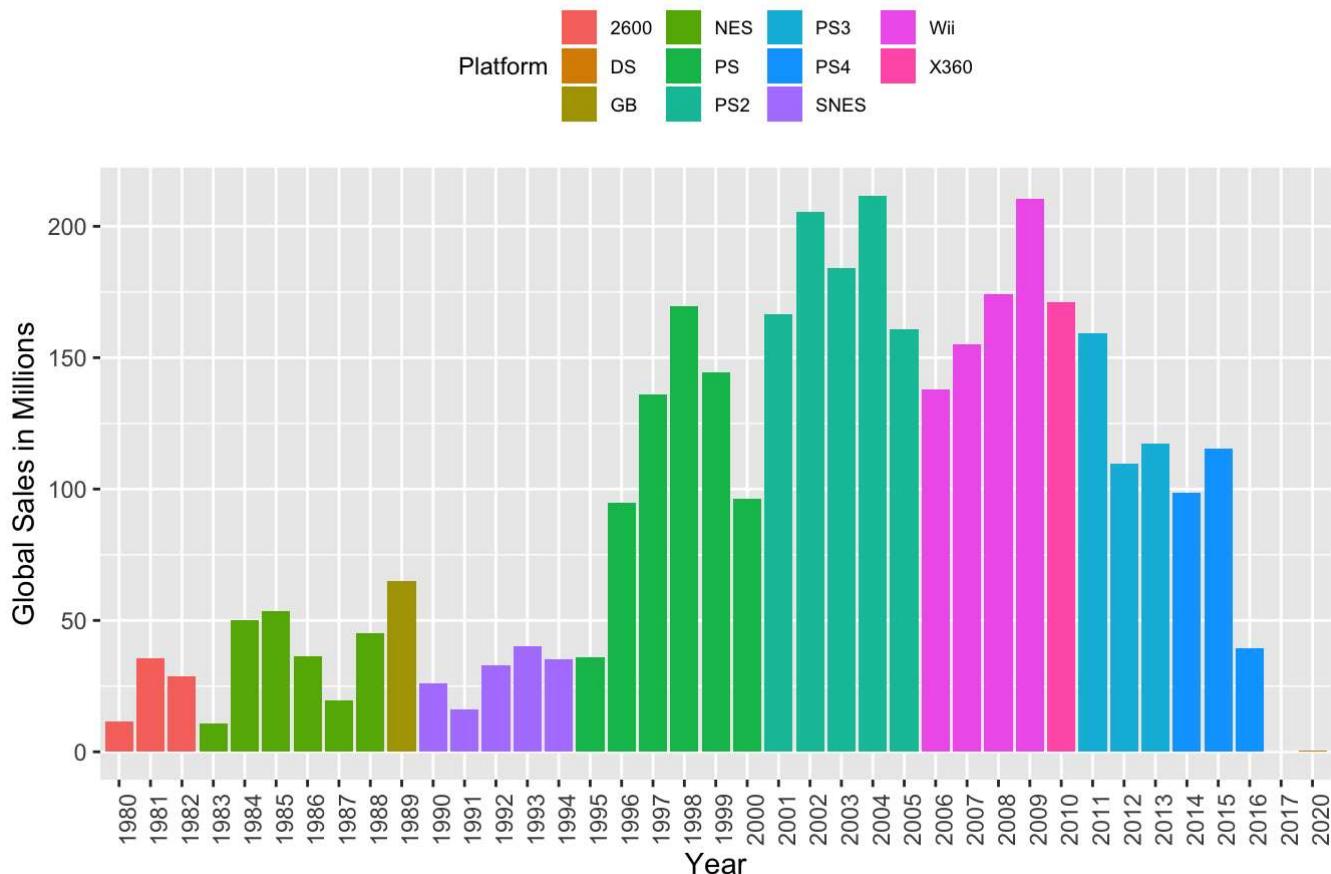


Globally Selling Platforms per Year

```
##      Min. 1st Qu. Median    Mean 3rd Qu.    Max.
## 0.03   35.42  94.68  92.34 157.17 211.78
```

PS2 is the top globally selling platform since 1980 with 211.78 million in 2004. Wii comes second with slightly less sales in 2009. However, NES happens to be the top globally selling platforms in 6 years (1995-2000), and PS2 the top in 5 years (2001-2005). On a yearly average, top video game publisher sales reach 92.34 million.

Top Globally Selling Platform per Year

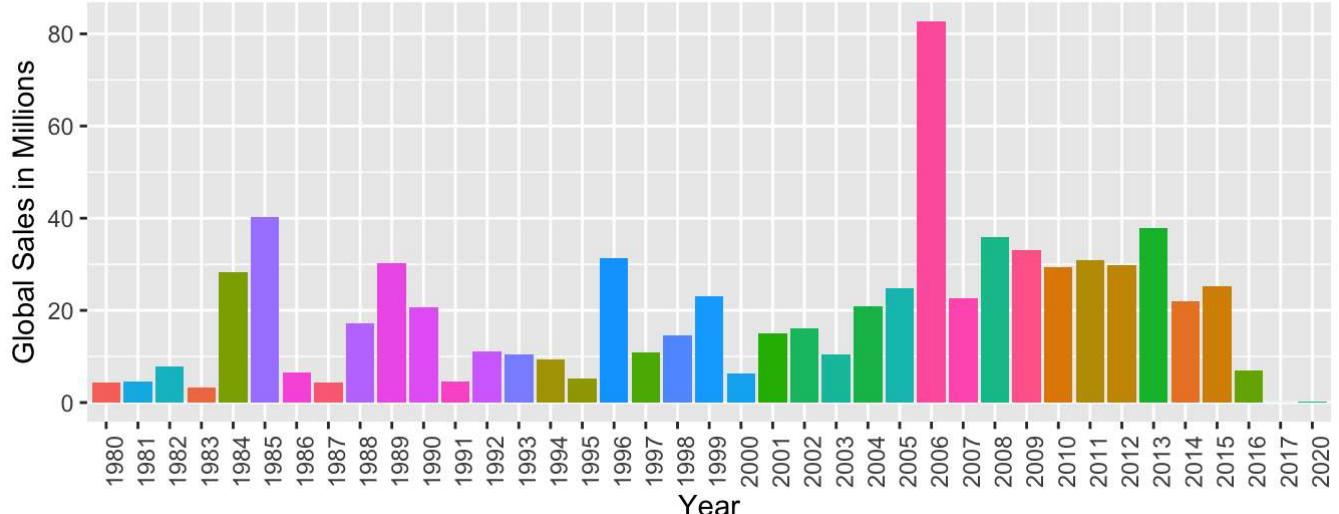
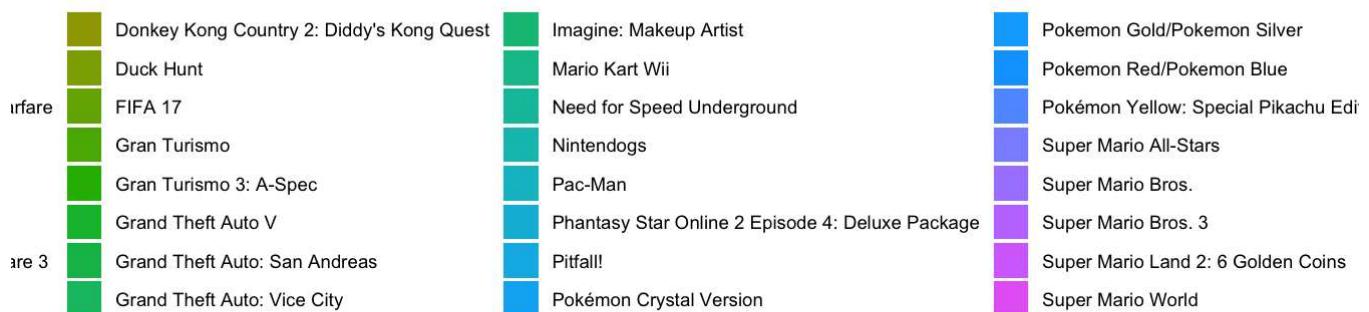


Globally Selling Games per Year

```
##      Min. 1st Qu. Median    Mean 3rd Qu.   Max.
## 0.04    6.71  16.15  18.93  28.86  82.74
```

Wii Sports is the top globally selling game since 1980 with 82.74 million in 2006. Super Mario Bros. comes second in 1985. On a yearly average, top video games sales reach 18.93 million.

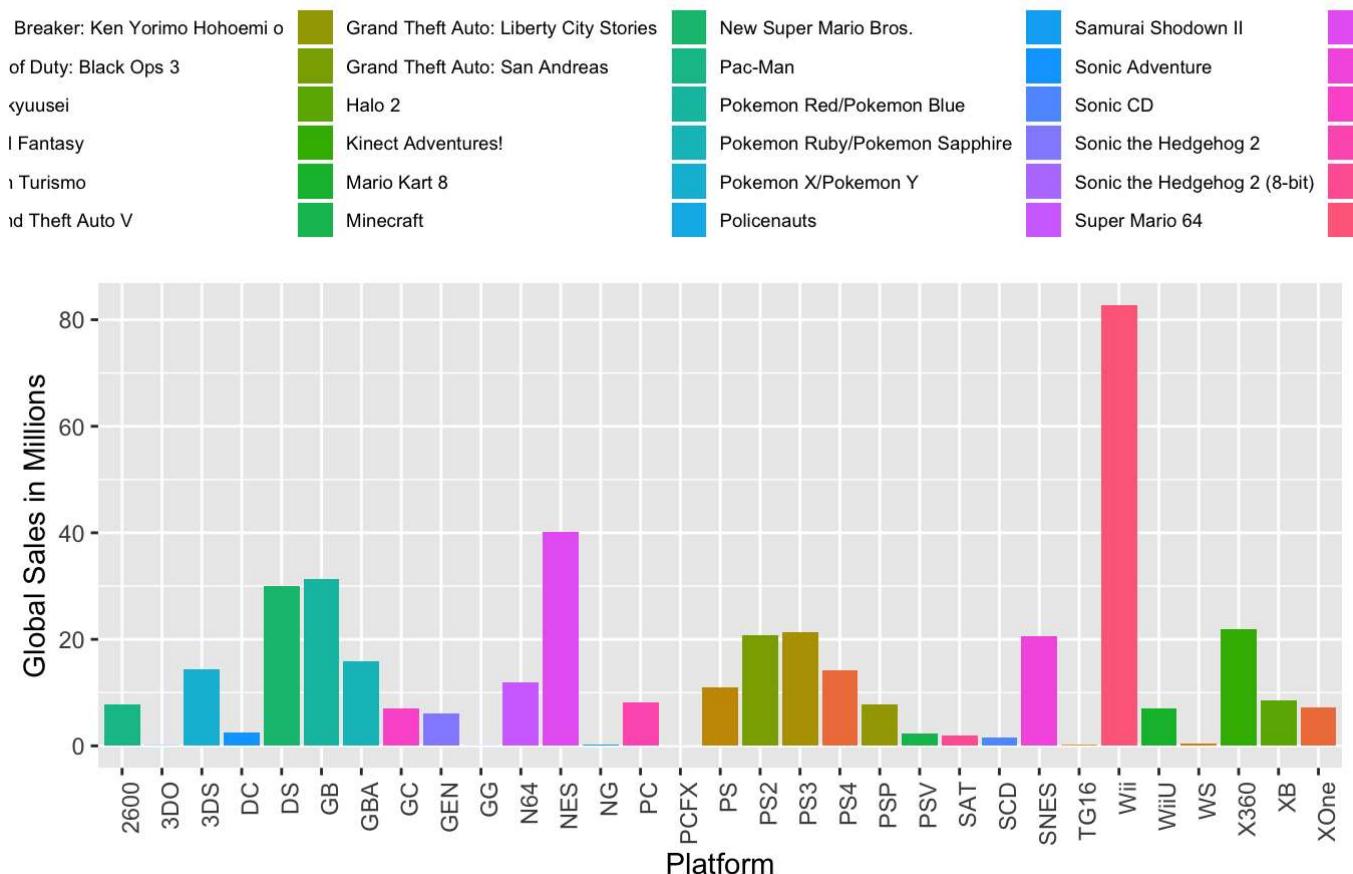
Top Globally Selling Games per Year



Globally Selling Video Games per Platform

```
##      Min. 1st Qu. Median    Mean 3rd Qu.    Max.
## 0.03    2.09   7.81 13.06 18.23 82.74
```

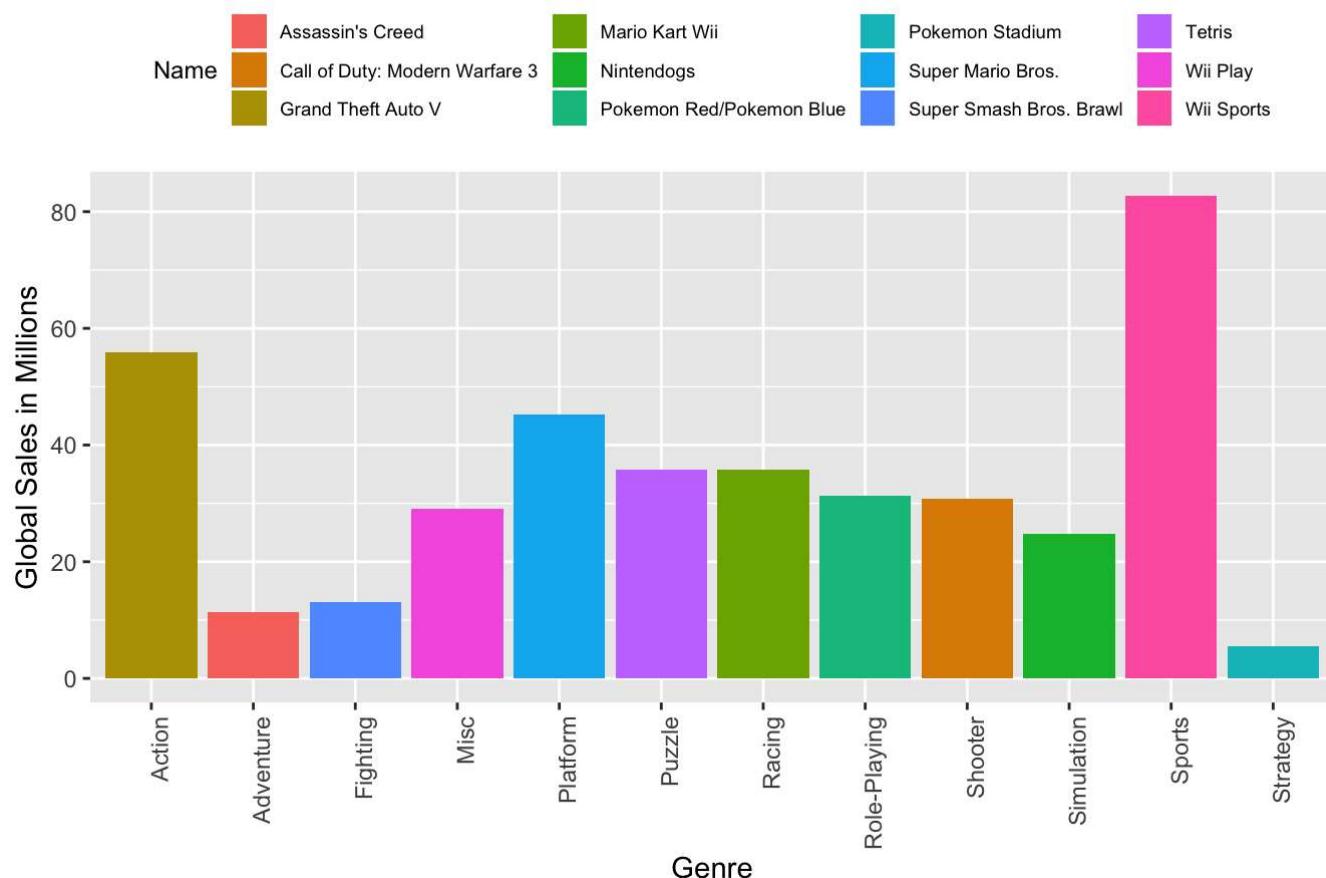
Top Globally Selling Video Games per Platform



Globally Selling Video Games per Genre

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	5.45	21.83	31.10	33.45	38.21	82.74

Top Globally Selling Video Games per Genre

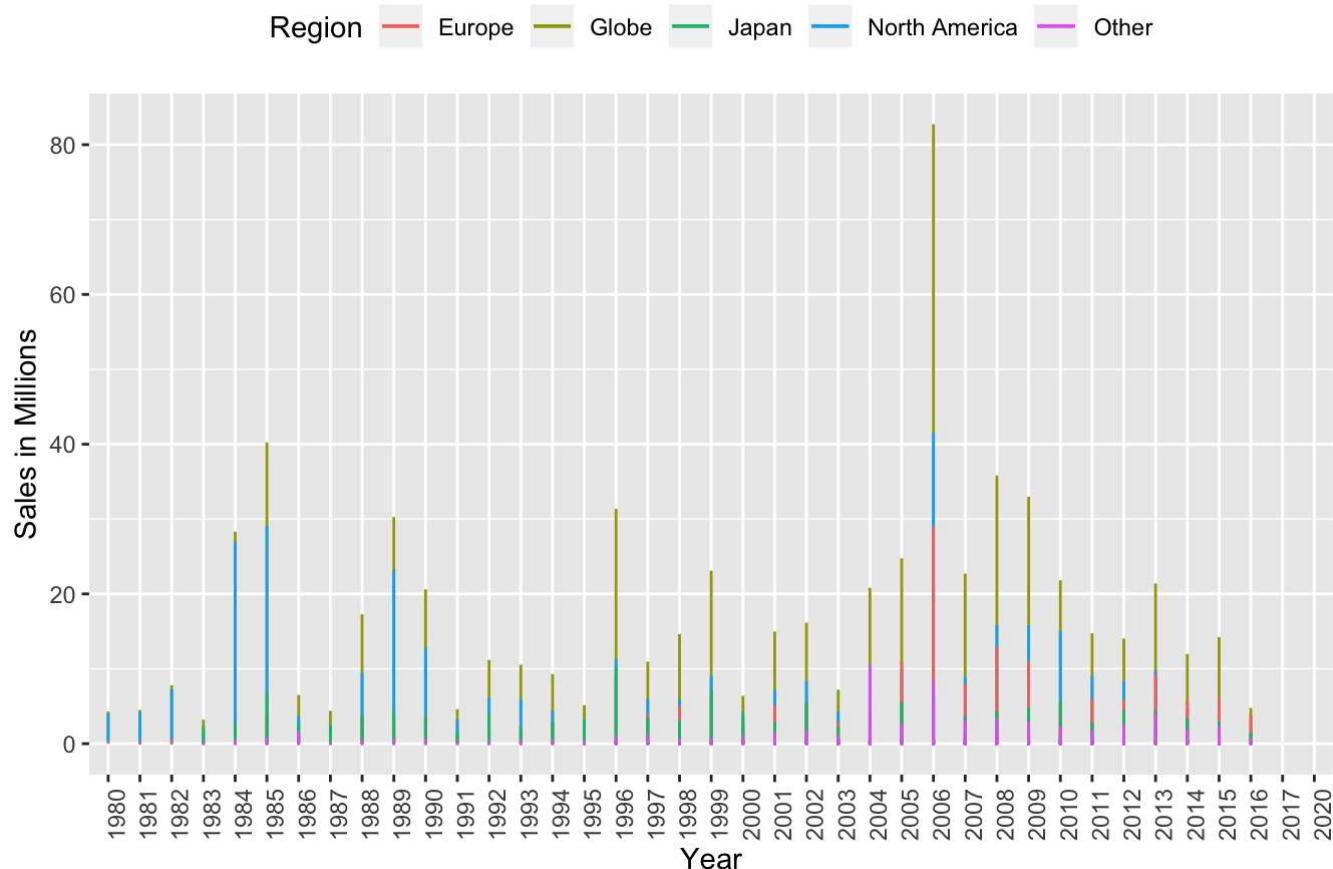


Global and Regional Sales

```
##      Min. 1st Qu. Median      Mean 3rd Qu.    Max.
##  0.0100  0.0600  0.1700  0.5402  0.4800 82.7400
```

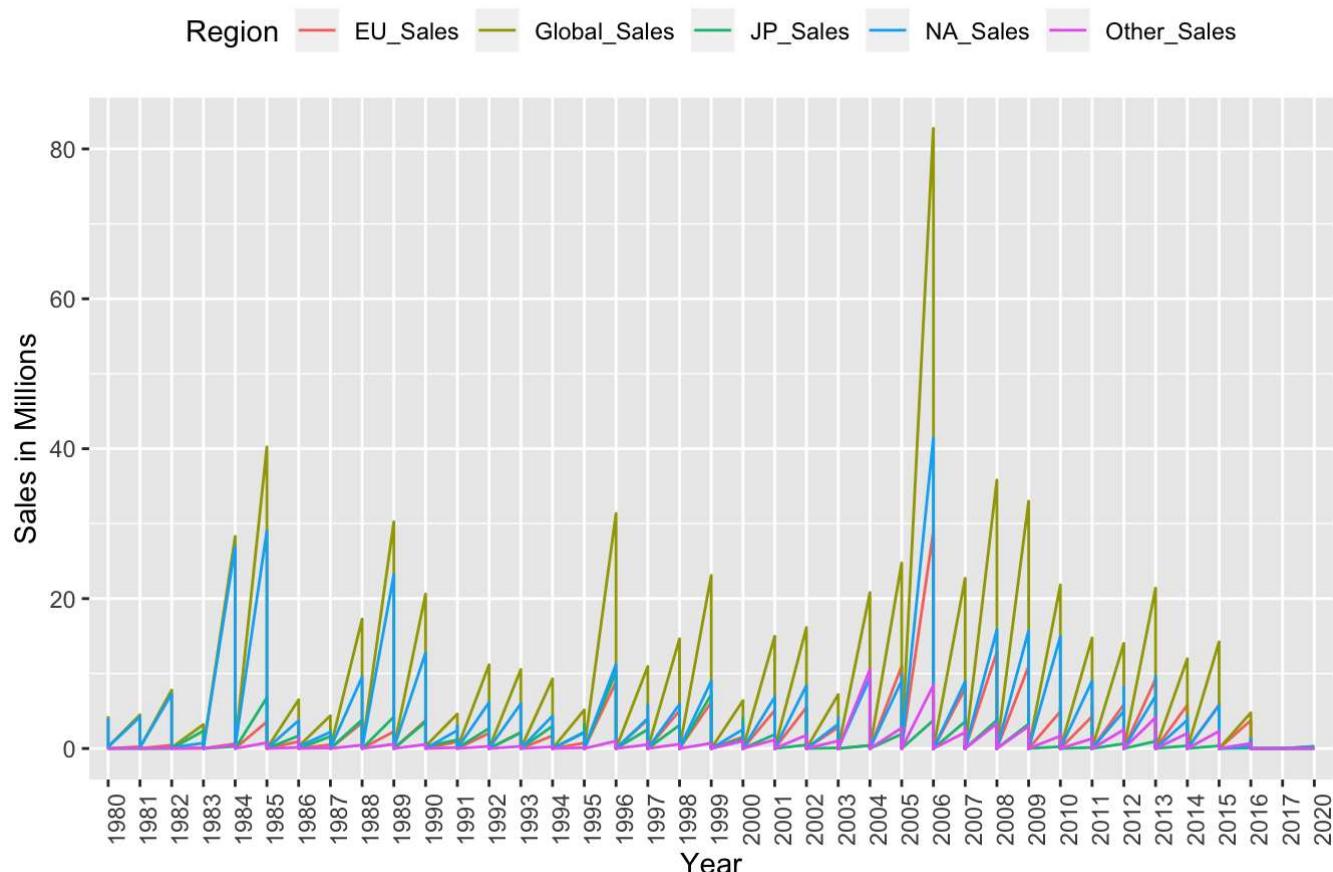
The below two plots illustrate a comparison of the regional and global sales. Follows that plots that show each region's sales compared to the global ones over time.

Video Games Yearly Regional Sales



There is a huge fall in sales in the last 5-6 years, especially in the North American region.

Video Games Yearly Regional Sales

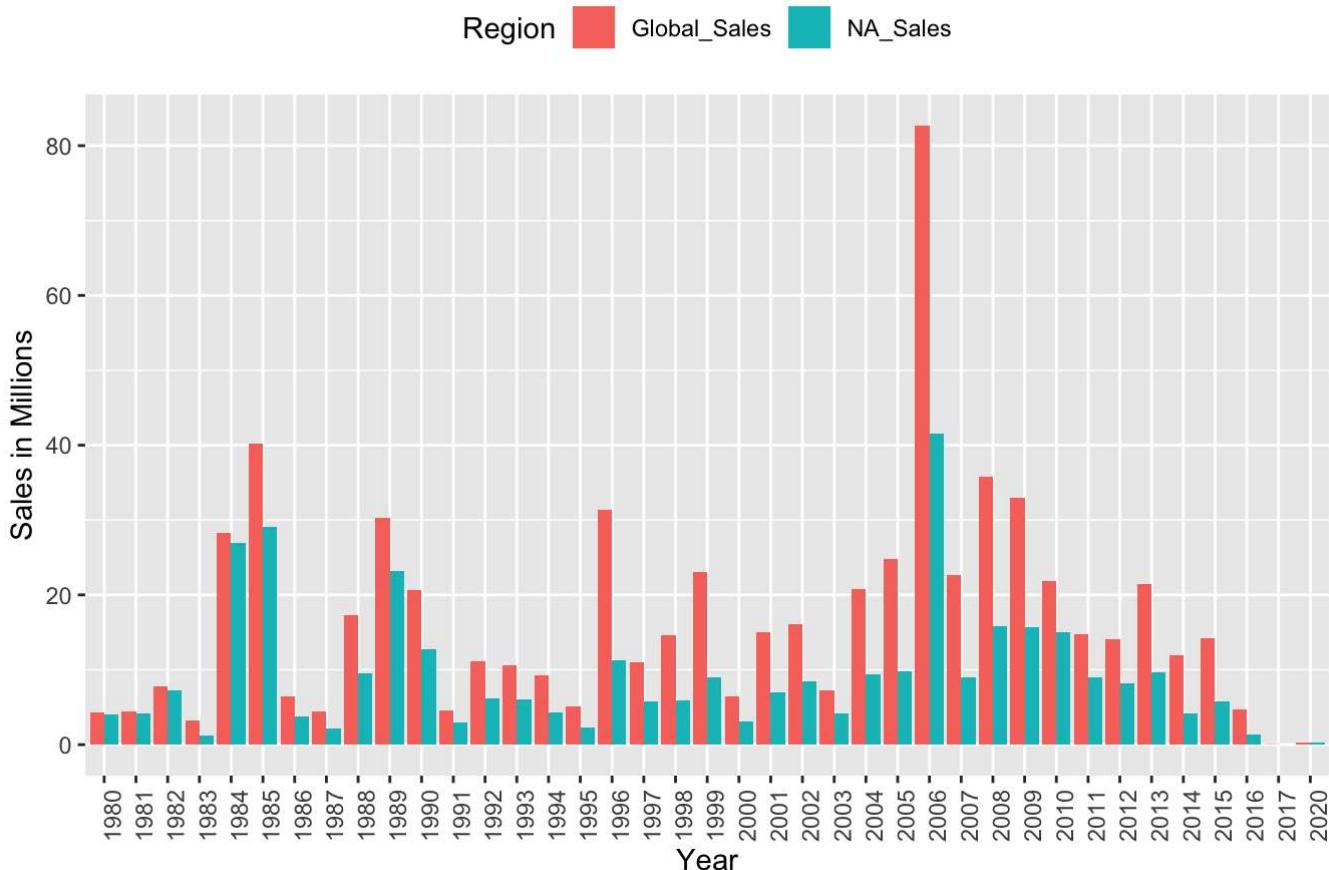


Global and North America Yearly Sales

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0800 0.2654 0.2400 41.4900
```

The NA sales reached a peak of 41.4900 million in 2006. On average, their sales are 0.2654 million.

North American and Global Yearly Video Games Sales

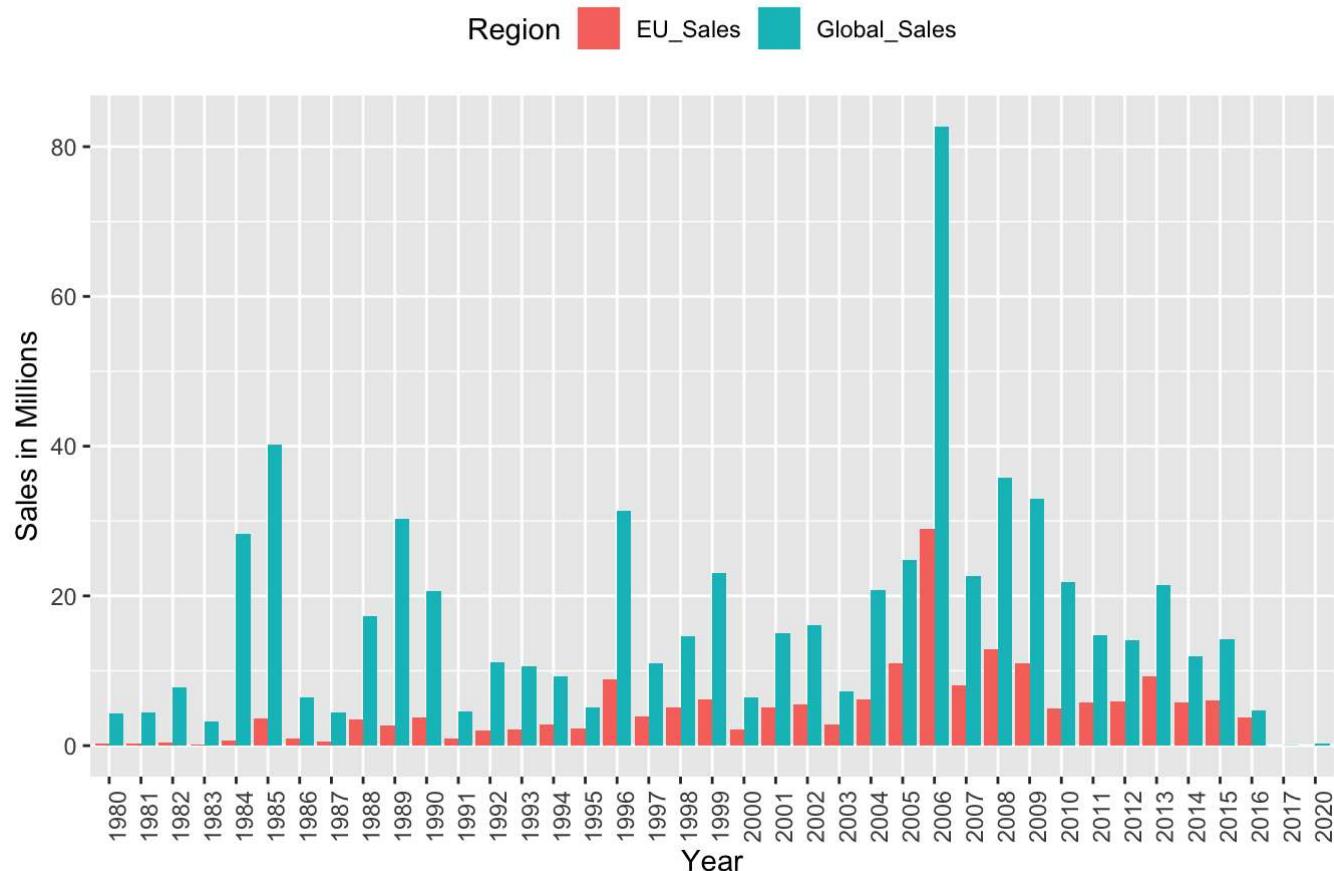


Global and European Yearly Sales

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.0000 0.0000 0.0200 0.1476 0.1100 29.0200
```

The EU sales reached a peak of 29.0200 million in 2006. On average, their sales are 0.1476 million.

European and Global Yearly Video Games Sales

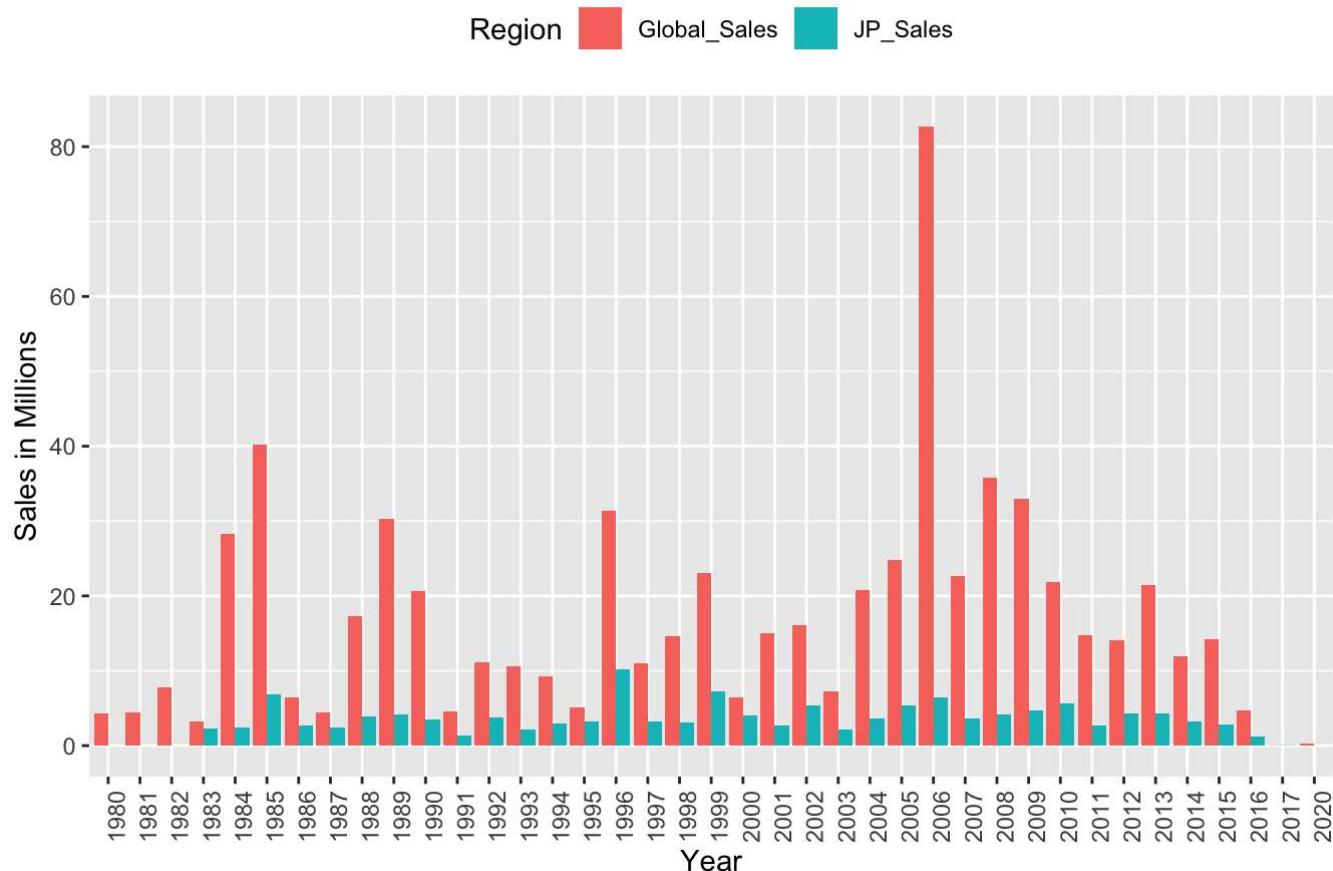


Global and Japanese Yearly Sales

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.00000 0.00000 0.00000 0.07866 0.04000 10.22000
```

The JP sales reached a peak of 10.22000 million in 1996. On average, their sales are 0.07866 million.

Japanese and Global Yearly Video Games Sales

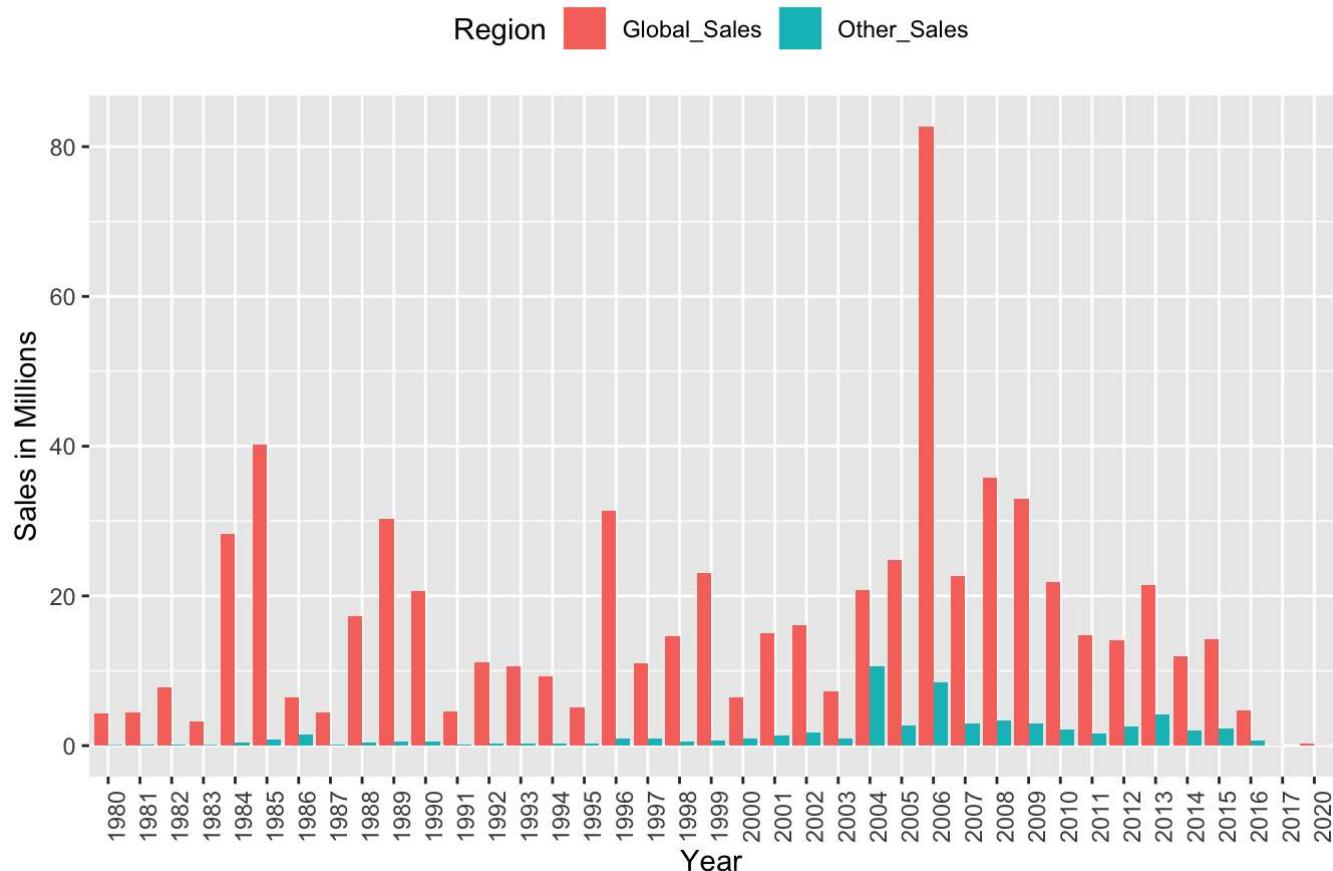


Global and Other Yearly Sales

```
##      Min. 1st Qu. Median     Mean 3rd Qu.    Max.
## 0.00000 0.00000 0.01000 0.04832 0.04000 10.57000
```

The other regional sales reached a peak of 10.57000 million in 2004. On average, their sales are 0.04832 million.

Other and Global Yearly Video Games Sales



Multivariate Analysis

Talk about some of the relationships you observed in this part of the investigation. Were there features that strengthened each other in terms of looking at your feature(s) of interest?

Although the action genre was the popular famous since 2000, the second popular genre Sports (as we saw in the bivariat analysis) peaked in 2006. This was further confirmed after plotting A. the globally selling games per year and finding out it was Wii Sports from the Sports genre in 2006, and B. the globally selling games per genre, and C. the globally selling games platform which of course is Wii.

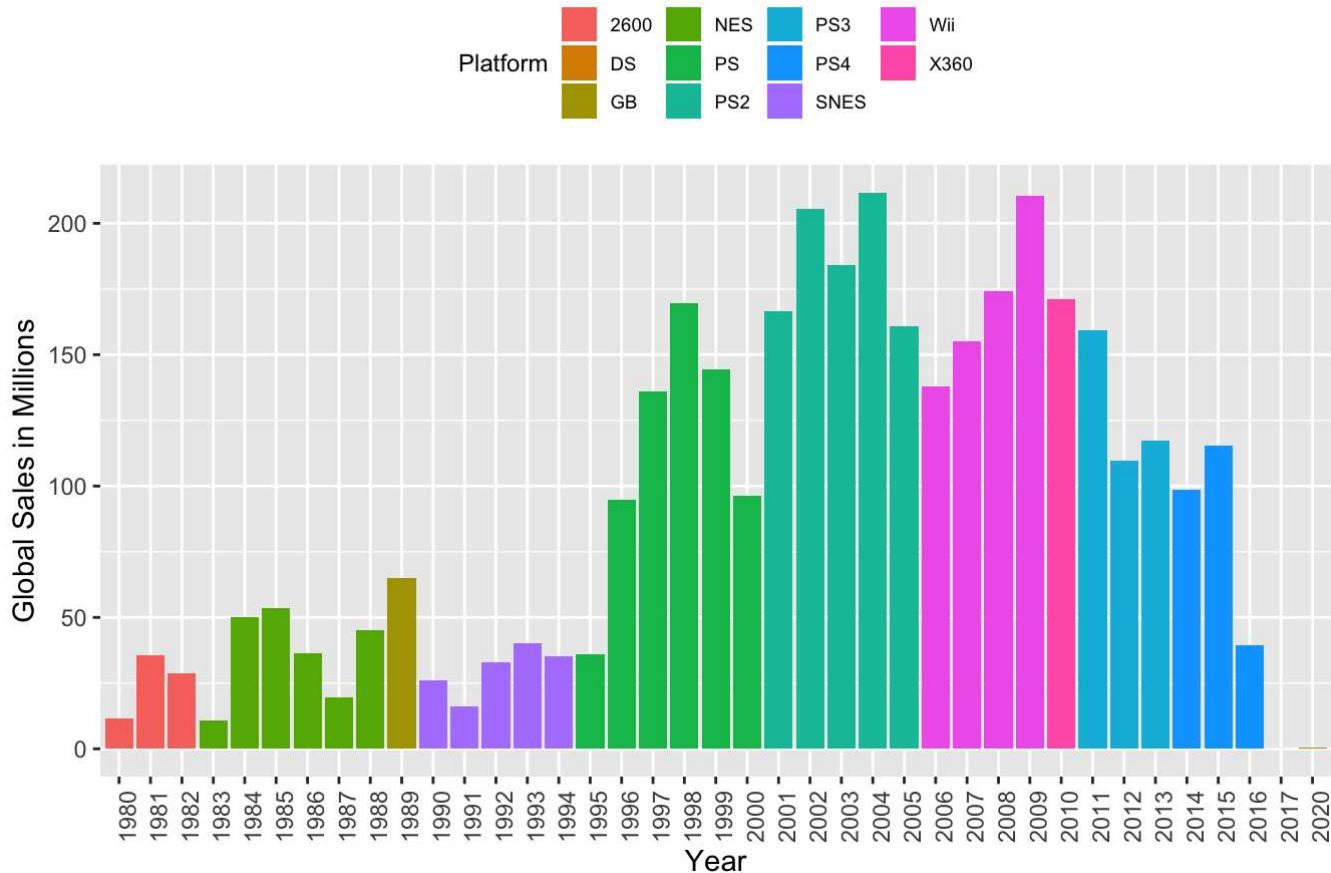
Were there any interesting or surprising interactions between features?

The global and regional yearly sales for North America and Europe further confirm the results found in the correlation matrix, where the plots show that a rise in each of these regions whenever the global sales rises. On another note, the globally selling per year plots for publishers and platforms show an interesting pattern, where for example between 2006 and 2009 the Nintendo publisher was dominant, and the Wii platform was dominant. This makes sense since Nintendo owns Wii, and was released for the first time in November 19, 2006. Video game publishers that also happen to own platforms/consoles publish a couple of games that work with their new product to help market it. Other publishers follow to ensure a competitor's advantage.

Final Plots and Summary

Plot One: Globally Selling Platforms per Year

Top Globally Selling Platform per Year

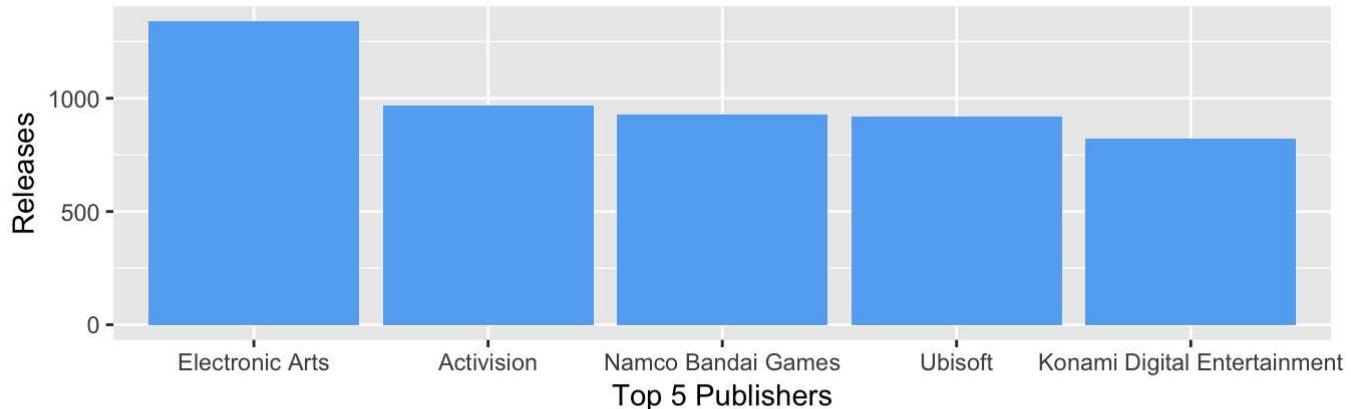


Description One

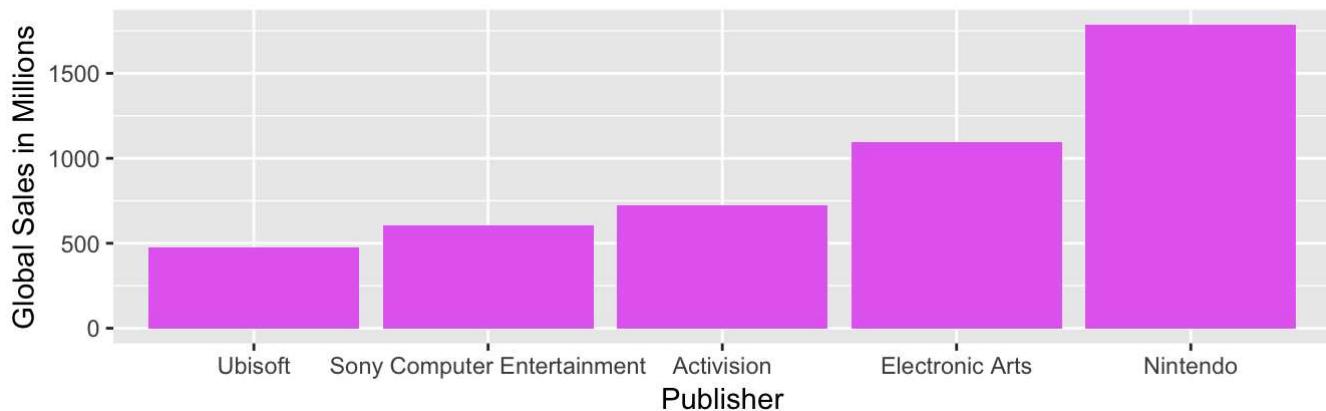
PS2 is the top globally selling platform since 1980 with 211.78 million in 2004. Wii comes second with slightly less sales in 2009. However, NES happens to be the top globally selling platforms in 6 years (1995-2000), and PS2 the top in 5 years (2001-2005). On a yearly average, top video game publisher sales reach 92.34 million. What is interesting about this plot is that it shows a pattern where a top selling publisher continues to hold that rank for a couple of years (3-6 years), with only one exception in the X360 case in 2010. Possible reasons for this could be that Wii did not have many popular games at the time.

Plot Two: Top Globally Selling and Releasing Publishers

Top 5 Releasing Publishers



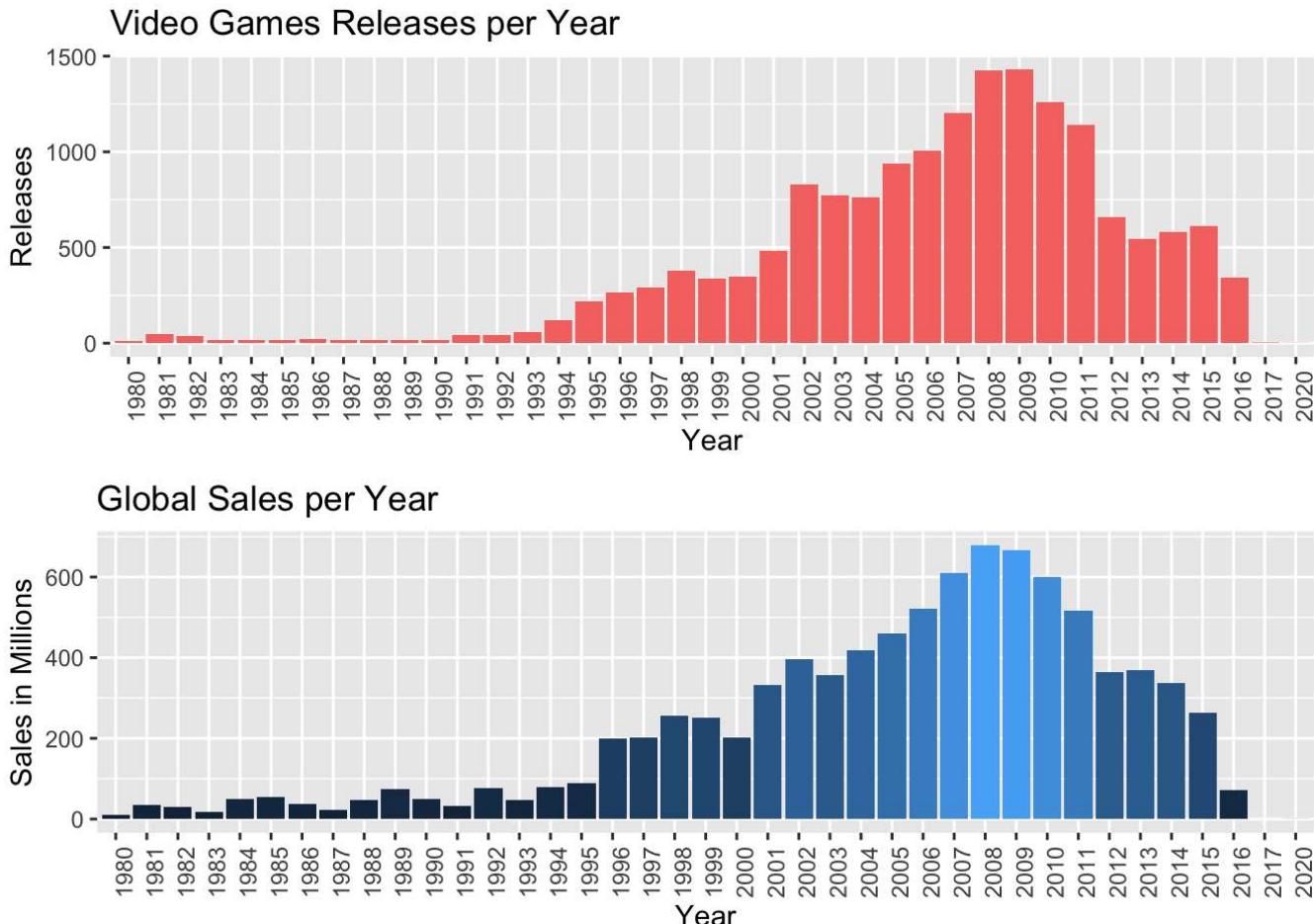
Top 5 Globally Selling Publishers



Description Two

The top releasing publisher is Electronic Arts with 1339 releases. Also in the top 5 are Activision, Namco Bandai Games, Ubisoft, and Konami digital Entertainment. However, the top globally selling publisher is Nintendo with 1784.4 million, which doesn't happen to be in any of the top 5 releasing publishers. Same thing goes for Sony Computer Entertainment and Ubisoft. This goes to show that releasing to many video games does not guarantee more sales.

Plot Three: Yearly Global Sales and Releases



Description Three Most video games were released in 2008 (1428 games) and 2009 (1431 games). The highest global sales were also in 2008, with a total of 678.90 million. 2009 comes in second with slightly less sales. Since 1996, the video game industry flourished. It continued to grow in the number of game releases, attracting more global sales, peaking in 2008-2009 as we can see in both plots of global sales/releases per year. We can also notice from the two plots that after the peak it started to gradually decrease.

Reflection

- Since 1980, video games global sales reached a total of 8920.44 million.
- Action games have been the most popular for over a decade. They contribute to almost 20% of the games released.
- Play Station is the most popular platform.
- Wii Sports is the top video game by revenue.
- Namco Bandai Company is producing maximum number of successful games.
- There is huge spike in the number of releases after 2000 and it peaked during 2008 and 2009.
- 2009 was the most successful year for the video games community.
- The last 5-6 years has seen a decrease in the revenue.
- EA is the top most publisher by number of releases.
- DS is the top most platform by number of releases.
- Wii Sports in 2006 generated huge revenue compared to all other games along the years.

- Nintendo has been dominating the market as the top publisher by revenue in 24 years since 1980.
- Releasing too many video games does not guarantee more sales as we have seen in the case of Nintendo, Sony Computer Entertainment and Ubisoft, where they were in the top selling publishers list but not in the top releasing publishers list.
- Once a platform clicks in the market i.e. top selling, it goes on to rule for few years (3-6 years).
- North America and Europe contribute 75% of the market share by revenue, and both had their sales peak in 2006, although the global sales peak was in 2008.

One aspect that limited this analysis is the absence of the sales of other parts of the world, rather than just having the variable Other_Sales. Also, the month of the year could likely contribute to the rise of sales. For example, certain video game genres could be always popular in a certain month of the year. For future work, I would like to find data on the buyers demographic which could explain a lot of the reasons behind the trends found, and improve the analysis. It will also help draw recommendations to the decision makers in this industry on where to focus their budget; which genre, which region, which platform, etc.