

Top 1000 Highest Hollywood Grossing Movies

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Introduction

People love to talk about the movies they love, and they love to talk about the movies they hate. It's hard to not get caught up in the conversation, and it's easy to get wrapped up in the stories and sometimes easy to get lost in the sea of entertainment. But sometimes it's good to step away and look at things from another perspective. Some of the most popular movies over the years have been box office bombs. Some of the most talked-about movies over the years have been financial failures. It's hard to tell which movies will be big or small, but one thing is for sure: knowing which movies have been the highest grossing is always interesting. Hence, I have chosen a topic called Top 1000 Highest Hollywood Grossing Movies.

A movie is the result of a huge amount of work done by many people. To learn new things, work on them and get them finished takes a great deal of knowledge and courage. It is also inspiring to learn about a new subject and make it come to life. In addition to the people's hard work, there are several other factors that affect a movie's success, such as storyline, budget, and actors. Having found the data of the highest grossing movies in history with all their important details, it is indeed a privilege for everyone in the world and for future generations too to watch those, get inspired and make many more best movies in the future. We can learn a lot through films, from the earliest days of cinema to today's technology. We sometimes find it helpful to have fun for a few minutes in these stressful times by watching movies, which are often very good. The famous Charlie Chaplin, for example, was brought to our awareness through movies and we can celebrate his legacy today because of these movies. When I was researching this topic, I discovered there are many other things that need to be considered while filming, such as film type, shots, camera angles, lighting, color, audio, editing, and setting (also known as mise-en-scene).

I also found fascinating the use of analytics in sports which became popular because of the movie Moneyball (2011). Now analytics has become a part of all sports and I have seen it mentioned in a book (Business Intelligence, Analytics, and Data Science: Sharda, Delen and Turban). Filmmaking is an art form that heavily relies on visualizing a scene before it happens. This is especially true in movies where millions of dollars are spent on special effects and sets, but it is also important in shorter projects where time and money are constraints.

Visual effects have become an essential part of movies of movie making. They have become so important that they are almost considered an essential part of filmmaking. They can make you laugh, cry, or gasp in surprise. They can transport you to another world or bring a long-dead character back to life. They can make a character look like a real person, or make an entire scene take place in a different location. For example, in Star Wars: The Force Awakens, there were over 8000 VFX shots in the movie, which is more than any other film in history. Additionally, there are Production houses like Walt Disney, Universal Studios which later helped them to build their own studios with different themes of their highest budgeted and top-rated movies to make available for people to experience which in turn resulted in getting a huge amount of revenue. To know more about such great movies and the profits they made to the history of cinema was really intriguing to me. This project will show some important details about the movie's domestic and international sales, its year of production, and its genre to help us understand more in detail the reasons behind why they are among the top 1000.

Data Description

1	Title	Name of the Movie
2	Movie Description	Gist of a movie in simple words
3	Distributor	Name of the Production House
4	Release Date	Date of the movie release
5	Domestic Sales	Sales within the Country
6	International Sales	Sales outside the Country
7	World Sales	Sales throughout the world
8	Genre	Classification of movie into different categories like Horror, Fiction, Comedy, Animation
9	Movie Run time	Length of the movie in Hours / Minutes
10	License	In simple terms, to show a movie in public, we will need permission from the copyright holders-PG-13,PG,G,R,G/PG,NC-17

Please find below link for my dataset available on Kaggle.com:

<https://www.kaggle.com/datasets/sanjeetsinghnaik/top-1000-highest-grossing-movies>

Data Cleaning

1. Data Split

Title and Year in same column

	Title	Movie Info	Distributor	Release Date	Domestic Sales (in \$)
0	Star Wars: Episode VII - The Force Awakens (2015)	Finn, an ex-stormtrooper, must join Han Sol	Walt Disney Studios Motion Pictures	16-Dec-15	936662225
1	Avengers: Endgame (2019)	help of remaining allies, the Avengers asser	Walt Disney Studios Motion Pictures	24-Apr-19	858373000
2	Avatar (2009)	unique mission becomes torn between follow	Twentieth Century Fox	16-Dec-09	760507625
3	Black Panther (2018)	must step forward to lead his people into a ne	Walt Disney Studios Motion Pictures	NA	700426566
4	Avengers: Infinity War (2018)	n attempt to defeat the powerful Thanos bef	Walt Disney Studios Motion Pictures	NA	678815482
5	Spider-Man: No Way Home (2021)	spell goes wrong, dangerous foes from other	Sony Pictures Entertainment (SPE)	NA	675813257
6	Titanic (1997)	s in love with a kind but poor artist aboard th	Paramount Pictures	19-Dec-97	659363944
7	Jurassic World (2015)	a genetically modified hybrid dinosaur, the In	Universal Pictures	10-Jun-15	652385625
8	The Avengers (2012)	ght as a team if they are going to stop the m	Walt Disney Studios Motion Pictures	25-Apr-12	623357910
9	Star Wars: Episode VIII - The Last Jedi (2017)	legends go on an epic adventure, unlocking n	Walt Disney Studios Motion Pictures	13-Dec-17	620181382
10	Incredibles 2 (2018)	mily roles: Bob Parr (Mr. Incredible) must m	Walt Disney Studios Motion Pictures	NA	608581744

In my first data cleansing step, I had to rearrange the title given since the date of release and the title of the movie appeared in the same column. To obtain a clear understanding of the year the movie was released and the Name of the movie, I had to divide the title into two columns shown in the below figure.

Title and Year separated

	Title	Title	MovieReleaseYear	Movie Info
0	Star Wars: Episode VII - The Force Awakens (2015)	Star Wars: Episode VII - The Force Awakens	2015	Finn, an ex-stormtrooper, must join Han Sol
1	Avengers: Endgame (2019)	Avengers: Endgame	2019	help of remaining allies, the Avengers asser
2	Avatar (2009)	Avatar	2009	unique mission becomes torn between follow
3	Black Panther (2018)	Black Panther	2018	must step forward to lead his people into a ne
4	Avengers: Infinity War (2018)	Avengers: Infinity War	2018	n attempt to defeat the powerful Thanos bef
5	Spider-Man: No Way Home (2021)	Spider-Man: No Way Home	2021	spell goes wrong, dangerous foes from other
6	Titanic (1997)	Titanic	1997	s in love with a kind but poor artist aboard th
7	Jurassic World (2015)	Jurassic World	2015	a genetically modified hybrid dinosaur, the In
8	The Avengers (2012)	The Avengers	2012	ght as a team if they are going to stop the m
9	Star Wars: Episode VIII - The Last Jedi (2017)	Star Wars: Episode VIII - The Last Jedi	2017	legends go on an epic adventure, unlocking m
10	Incredibles 2 (2018)	Incredibles 2	2018	mily roles: Bob Parr (Mr. Incredible) must m

2. Converted String to Minutes

Movie Runtime in String

J	K	L
World Sales (in	Genre	Movie Runtime
2069521700	['Action', 'Adventure', 'Sci-Fi']	2 hr 18 min
2797501328	['Action', 'Adventure', 'Drama', 'Sci-Fi']	3 hr 1 min
2847246203	['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 42 min
1347597973	['Action', 'Adventure', 'Sci-Fi']	2 hr 14 min
2048359754	['Action', 'Adventure', 'Sci-Fi']	2 hr 29 min
1544455963	['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 28 min
2201647264	['Drama', 'Romance']	3 hr 14 min
1670516444	['Action', 'Adventure', 'Sci-Fi']	2 hr 4 min
1518815515	['Action', 'Adventure', 'Sci-Fi']	2 hr 23 min

In this data cleaning step, I took a column calls Movie Runtime. This column is in String like 2 hr 18 minutes. I converted this string into time and then converted into total minutes

Movie Runtime in Minutes

World Sales (in)	Genre	Movie Runtime	License	Movie Runtime	MovieRuntimeMinutes
2069521700	['Action', 'Adventure', 'Sci-Fi']	2 hr 18 min	PG-13	2:18	138
2797501328	['Action', 'Adventure', 'Drama', 'Sci-Fi']	3 hr 1 min	PG-13	3:01	181
2847246203	['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 42 min	PG-13	2:42	162
1347597973	['Action', 'Adventure', 'Sci-Fi']	2 hr 14 min	NA	2:14	134
2048359754	['Action', 'Adventure', 'Sci-Fi']	2 hr 29 min	NA	2:29	149
1544455963	['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 28 min	NA	2:28	148
2201647264	['Drama', 'Romance']	3 hr 14 min	PG-13	3:14	194
1670516444	['Action', 'Adventure', 'Sci-Fi']	2 hr 4 min	PG-13	2:04	124
1518815515	['Action', 'Adventure', 'Sci-Fi']	2 hr 23 min	PG-13	2:23	143

3. Replace NULL

Release Date with NA

Title	MovieReleaseYear	Movie Info	Distributor	Release Date
Star Wars: Episode VII - The Force Awakens	2015	d Finn, an ex-stormtrooper, must join Han So	Walt Disney Studios Motion Pictures	16-Dec-15
Avengers: Endgame	2019	help of remaining allies, the Avengers asse	Walt Disney Studios Motion Pictures	24-Apr-19
Avatar	2009	unique mission becomes torn between follow	Twentieth Century Fox	16-Dec-09
Black Panther	2018	must step forward to lead his people into a ne	Walt Disney Studios Motion Pictures	NA
Avengers: Infinity War	2018	n attempt to defeat the powerful Thanos bef	Walt Disney Studios Motion Pictures	NA
Spider-Man: No Way Home	2021	spell goes wrong, dangerous foes from other	Sony Pictures Entertainment (SPE)	NA
Titanic	1997	s in love with a kind but poor artist aboard th	Paramount Pictures	19-Dec-97

In this data cleaning step, I replaced NULL value with default values. In Movie Release Date column, it got some NA values I replaced this NA value with January 1st of that release year based on Movie year

Release Date NA filled with 01/01

Title	MovieReleaseYear	Movie Info	Distributor	ReleaseDate_Str	ReleaseDate
Star Wars: Episode VII - The Force Awakens	2015	d Finn, an ex-stormtrooper, must join Han So	Walt Disney Studios Motion Pictures	16-Dec-2015	12/16/15
Avengers: Endgame	2019	help of remaining allies, the Avengers asse	Walt Disney Studios Motion Pictures	24-Apr-2019	4/24/19
Avatar	2009	unique mission becomes torn between follow	Twentieth Century Fox	16-Dec-2009	12/16/09
Black Panther	2018	must step forward to lead his people into a ne	Walt Disney Studios Motion Pictures	NA	1/1/18
Avengers: Infinity War	2018	n attempt to defeat the powerful Thanos bef	Walt Disney Studios Motion Pictures	NA	1/1/18
Spider-Man: No Way Home	2021	spell goes wrong, dangerous foes from other	Sony Pictures Entertainment (SPE)	NA	1/1/21
Titanic	1997	s in love with a kind but poor artist aboard th	Paramount Pictures	19-Dec-1997	12/19/97
Jurassic World	2015	genetically modified hybrid dinosaur, the In	Universal Pictures	10-Jun-2015	6/10/15
The Avengers	2012	ght as a team if they are going to stop the m	Walt Disney Studios Motion Pictures	25-Apr-2012	4/25/12

4. Change Data Type

Sales in String

Title	MovieReleaseYear	Movie Info	Distributor	ReleaseDate_String	ReleaseDate	Domestic Sales (in \$)
Star Wars: Episode VII - The Force Awakens	2015	d Finn, an ex-stormtrooper, must join Han So	Walt Disney Studios Motion Pictures	16-Dec-2015	12/16/15	936662225
Avengers: Endgame	2019	help of remaining allies, the Avengers asse	Walt Disney Studios Motion Pictures	24-Apr-2019	4/24/19	858373000
Avatar	2009	unique mission becomes torn between follow	Twentieth Century Fox	16-Dec-2009	12/16/09	760507625
Black Panther	2018	must step forward to lead his people into a ne	Walt Disney Studios Motion Pictures	NA	1/1/18	700426566
Avengers: Infinity War	2018	n attempt to defeat the powerful Thanos bef	Walt Disney Studios Motion Pictures	NA	1/1/18	678815482
Spider-Man: No Way Home	2021	spell goes wrong, dangerous foes from other	Sony Pictures Entertainment (SPE)	NA	1/1/21	675813257
Titanic	1997	s in love with a kind but poor artist aboard th	Paramount Pictures	19-Dec-1997	12/19/97	659363944
Jurassic World	2015	genetically modified hybrid dinosaur, the In	Universal Pictures	10-Jun-2015	6/10/15	652385625
The Avengers	2012	ght as a team if they are going to stop the m	Walt Disney Studios Motion Pictures	25-Apr-2012	4/25/12	623357910

In this data cleaning step, I changed a string data type to dollar value. Domestic Sales was given as string, and I changed it to dollar value

Sales in Currency

Title	MovieReleaseYear	Movie Info	Distributor	ReleaseDate_String	ReleaseDate	Domestic Sales (in \$)
Star Wars: Episode VII - The Force Awakens	2015	Finn, an ex-stormtrooper, must join Han Solo	Walt Disney Studios Motion Pictures	16-Dec-2015	12/16/15	\$936,662,225
Avengers: Endgame	2019	With the help of remaining allies, the Avengers assemble	Walt Disney Studios Motion Pictures	24-Apr-2019	4/24/19	\$858,373,000
Avatar	2009	A unique mission becomes torn between following his	Twentieth Century Fox	16-Dec-2009	12/16/09	\$760,507,625
Black Panther	2018	T'Challa must step forward to lead his people into a new	Walt Disney Studios Motion Pictures	NA	1/1/18	\$700,426,566
Avengers: Infinity War	2018	In an attempt to defeat the powerful Thanos before	Walt Disney Studios Motion Pictures	NA	1/1/18	\$678,815,482
Spider-Man: No Way Home	2021	When a spell goes wrong, dangerous foes from other	Sony Pictures Entertainment (SPE)	NA	1/1/21	\$675,813,257
Titanic	1997	Ros is in love with a kind but poor artist aboard the	Paramount Pictures	19-Dec-1997	12/19/97	\$659,363,944
Jurassic World	2015	A genetically modified hybrid dinosaur, the Indominus	Universal Pictures	10-Jun-2015	6/10/15	\$652,385,625
The Avengers	2012	The Avengers must fight as a team if they are going to stop the	Walt Disney Studios Motion Pictures	25-Apr-2012	4/25/12	\$623,357,910

5. NA to NULL

License with NA

Genre	Movie Runtime	License
['Action', 'Adventure', 'Sci-Fi']	2 hr 18 min	PG-13
['Action', 'Adventure', 'Drama', 'Sci-Fi']	3 hr 1 min	PG-13
['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 42 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 14 min	NA
['Action', 'Adventure', 'Sci-Fi']	2 hr 29 min	NA
['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 28 min	NA
['Drama', 'Romance']	3 hr 14 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 4 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 23 min	PG-13

In this data cleaning step, I replaced string NA to NULL. License column has some values call

NA, I replaced them with NULL

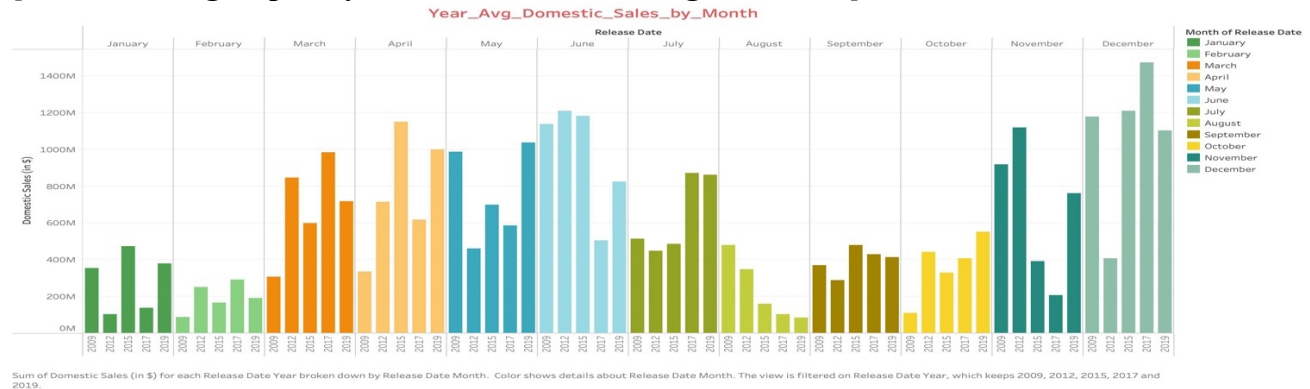
License with NULL

Genre	Movie Runtime	License
['Action', 'Adventure', 'Sci-Fi']	2 hr 18 min	PG-13
['Action', 'Adventure', 'Drama', 'Sci-Fi']	3 hr 1 min	PG-13
['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 42 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 14 min	NULL
['Action', 'Adventure', 'Sci-Fi']	2 hr 29 min	NULL
['Action', 'Adventure', 'Fantasy', 'Sci-Fi']	2 hr 28 min	NULL
['Drama', 'Romance']	3 hr 14 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 4 min	PG-13
['Action', 'Adventure', 'Sci-Fi']	2 hr 23 min	PG-13

Data Visualizations

1.Does the release time of a movie impact it's gross profit? What seasons are most profitable?

[Sum of Sales grouped by Year and Month, Histogram, Dates]



As shown in the above chart, the most profitable season is the Fall, which comprises December and November. Then, the summer holiday season follows, which consists of June, July, and August. These two seasons account for more than half of the average gross sales for the year, and they are only spread over five months. Data has been organized by year on the X-axis and domestic sales on the Y-axis. Lastly, I have also coded the months based on the frequency of the movies released and the sales they contributed to. I considered the top five years to make this analysis easier. In fact, this report has answered my question as more sales and profits depend on the release time of the movie. Each month is shown as a different color on the right side of the figure to make the report more understandable.

2. In the film industry, how has the overseas market changed over time?

[Reference Line, Dates, Sum of Sales group by Year]

Chart-1

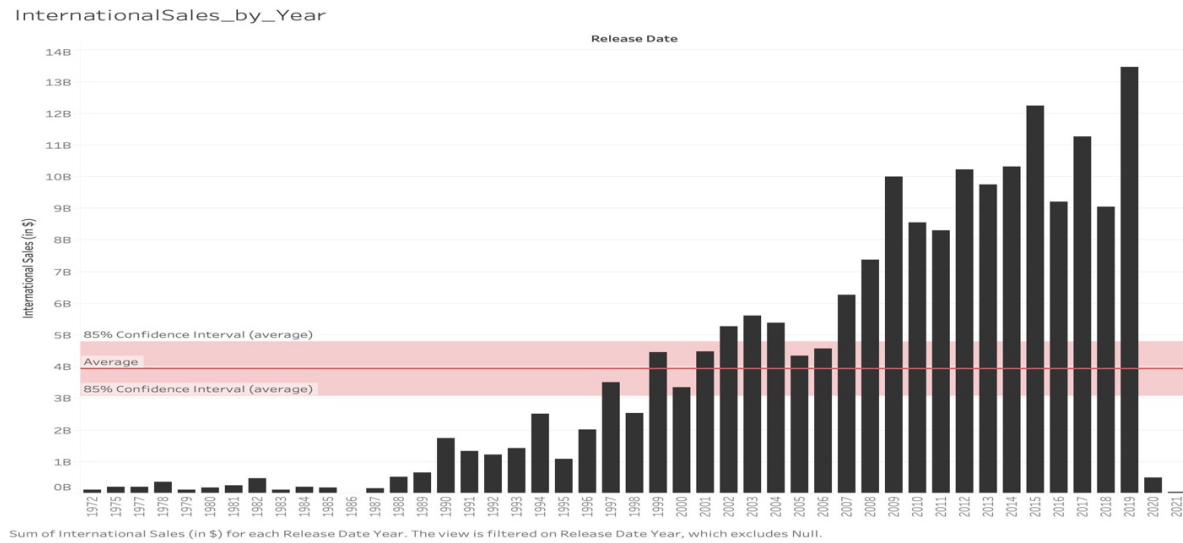
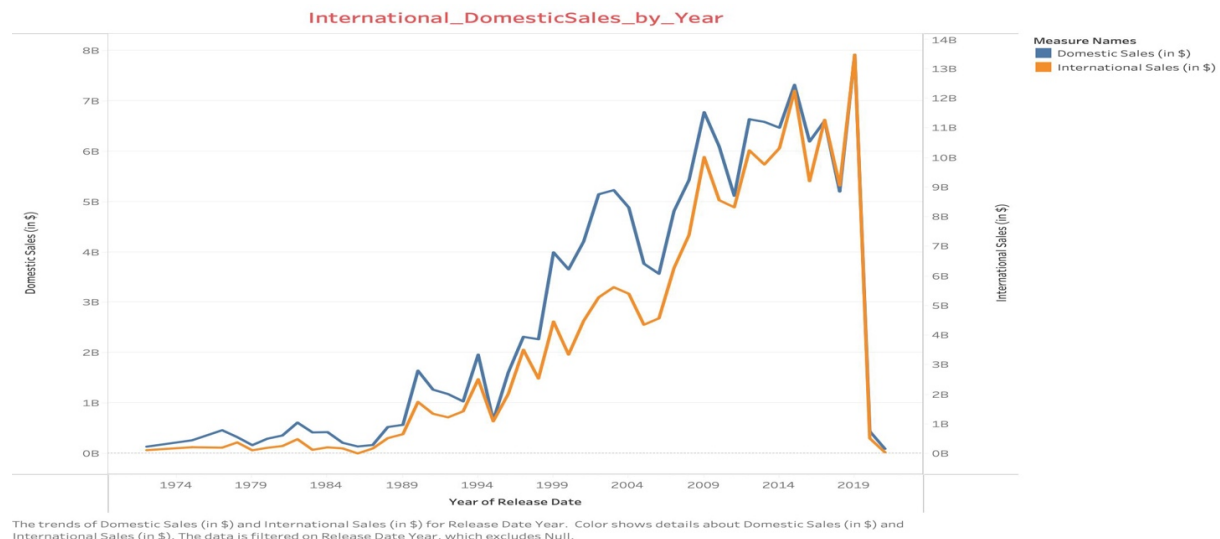


Chart-2



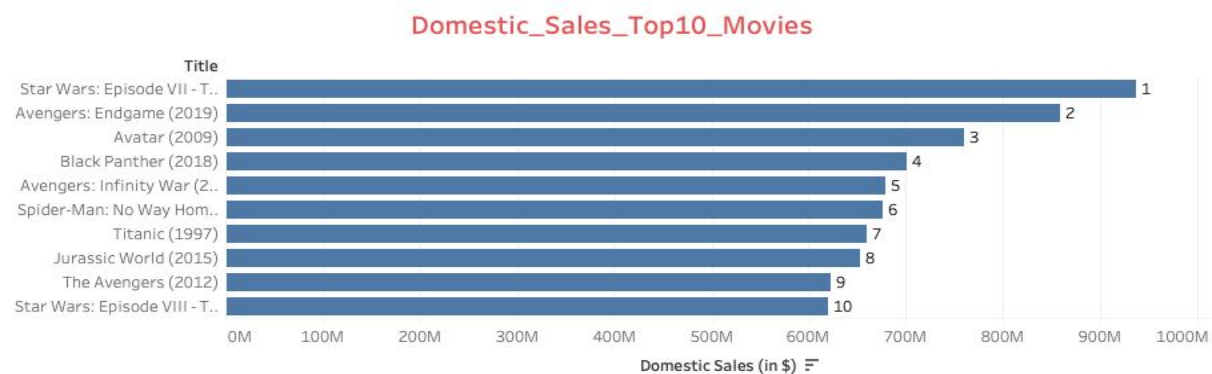
Data has been organized by Year on the X-axis and International Sales on the Y-axis. According to the above chart-1, worldwide ticket sales have been increasing rapidly since the mid-1900s. Prior to 2000, domestic ticket sales in the United States dominated or were equal to overseas sales. Over the past decade, the overseas market has become increasingly dominant,

nearly doubling the domestic US market's ticket sales in 2019. I have also added a reference line to the graph to represent the average domestic sales each year for better understanding.

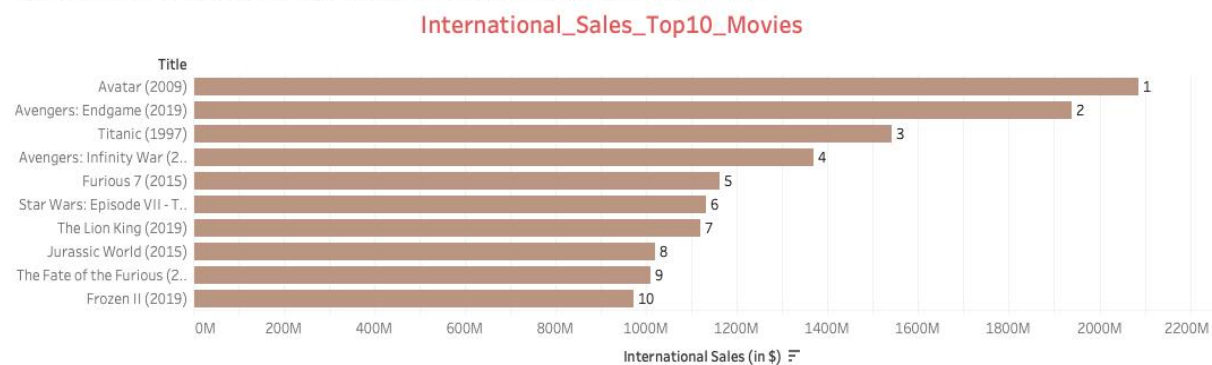
In chart 2, I displayed both domestic and international sales, with a comparison between them. We can clearly see an increase in sales both domestically and internationally over the past several years in the film industry. A decrease in sales is seen, both domestically and internationally, in the 2020s and 2021s due to COVID.

3. How do the most popular movies overseas or internationally compared to that in the United States?

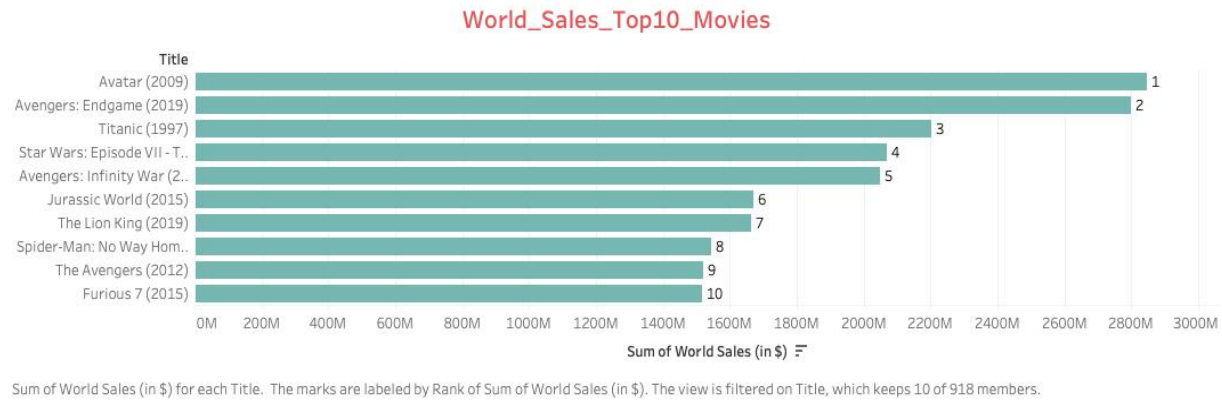
[Rank, Filtered by Top-10]



Sum of Domestic Sales (in \$) for each Title. The marks are labeled by Rank of Domestic Sales (in \$). The view is filtered on sum of Domestic Sales (in \$) and Title. The sum of Domestic Sales (in \$) filter includes everything. The Title filter keeps 10 of 918 members.



Sum of International Sales (in \$) for each Title. The marks are labeled by Rank of International Sales (in \$). The view is filtered on Title, which keeps 10 of 918 members.



There is an interesting aspect to the rise of overseas markets, which is to observe how various movies are performing in those markets. To do this, I compared domestic, internationally, and worldwide sales for the 10 most popular movies. It is interesting to note that "Avatar" took first place in terms of sales in both overseas and worldwide markets. The data, however, shows that this is not the case with domestic sales. "Star wars Episode VII" ranks first in domestic sales. Furthermore, it is interesting to see that "Star wars Episode VII and VIII" are in the top 10 for domestic sales but are nowhere to be found in overseas and worldwide sales. We can conclude that if global success is to be achieved, it is not enough to cater only to the domestic U.S. film market.

4. Is it typical that high sales are generated by certain movie genre?

[Box and Whisker Plot]



The dataset contains extensive list of movie genres. The above chart shows the distribution of sales of top-20 movies in terms of Genre. I utilized “Whisker and Plot” to show the distribution of different movies and their sales. Also, this figure shows that just because a movie genre has historically generated high gross sales, it does not necessarily mean that it is the best genre to produce a movie since genre density must be considered on top of genre popularity. As an example, the genre "Drama, Romance- Titanic (1997) has historically generated high gross sales as one of the top-10 highest sales of its genre. Additionally, we can say that movie sales also don't solely depend on genre, but also on when it's released. When the movie is released during the holiday season or during winter break, there is a high likelihood of sales increasing. Science fiction movies always rank as one of the most appealing genres to audiences, which is why they see high sales averages.

5. What is the most profitable studio for each rating?

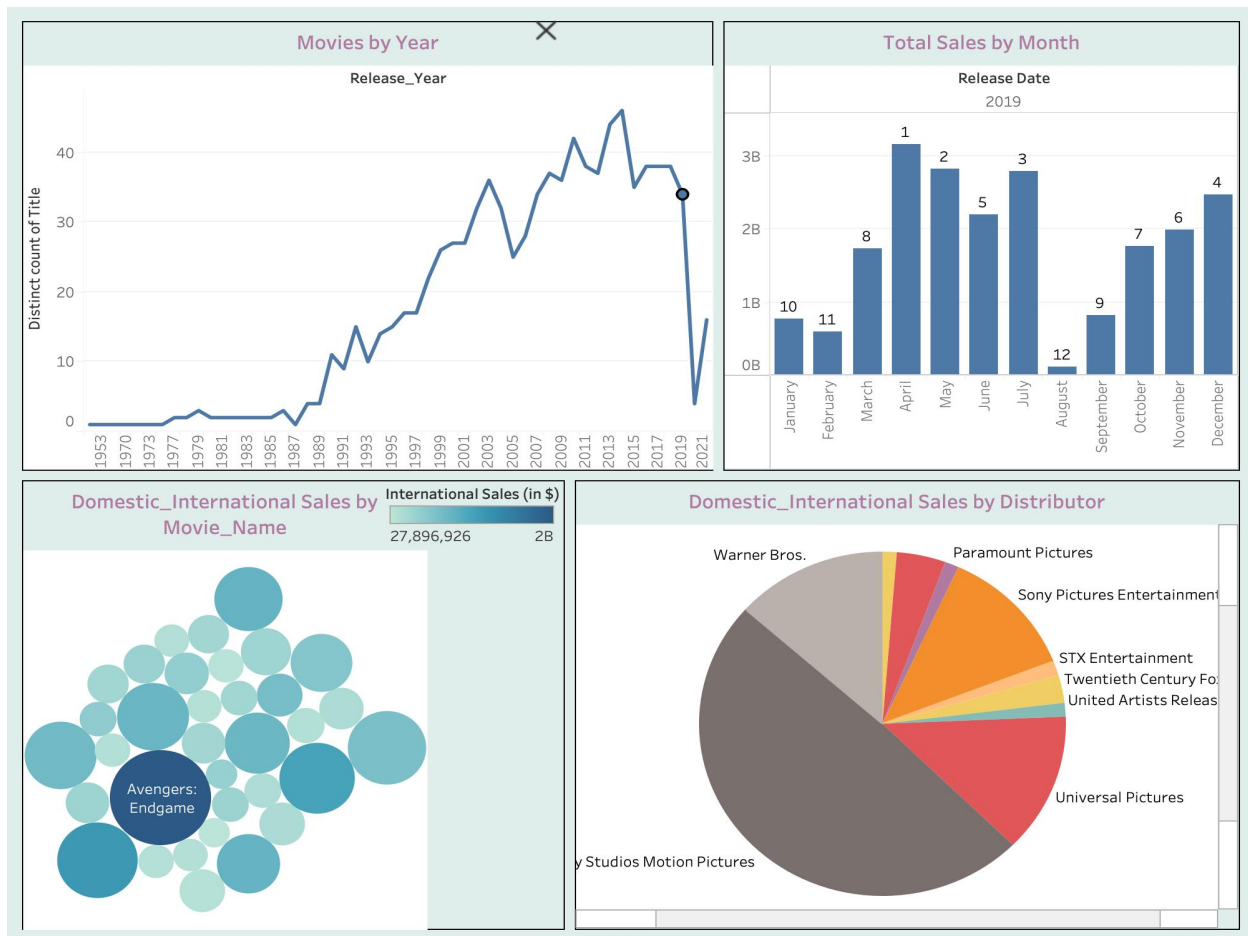
[Group by Distributor, Histogram]



- License G- All ages are admitted
- License PG – Parental Guidance Suggested
- License PG-13 – Parents cautioned-to determine whether their children under age 13 can watch or not.
- License R- Restricted for children under age 17.

On the X-axis are the top-10 studios within each rating class, and on the Y-axis are the domestic sales for each rating class. There is a huge sales surge for PG-13 movies because it is the most general rating that appeals to the largest audience and therefore generates the most revenue. On the other hand, are gradually decreasing as G and R ratings are increasing, as G-rated films are typically marketed to children, therefore average gross sales are also on the lower end. By using this chart, we can easily determine which studio prefers which type of rating and that helps the moviemaker to decide which he can select or consider for his film. For instance, if a movie maker wanted to make an animation film, it would be wise to approach the studio that has the highest sales for the rating. Since ratings are also important, it's important to be cautious of the movie's content as it ultimately affects its gross.

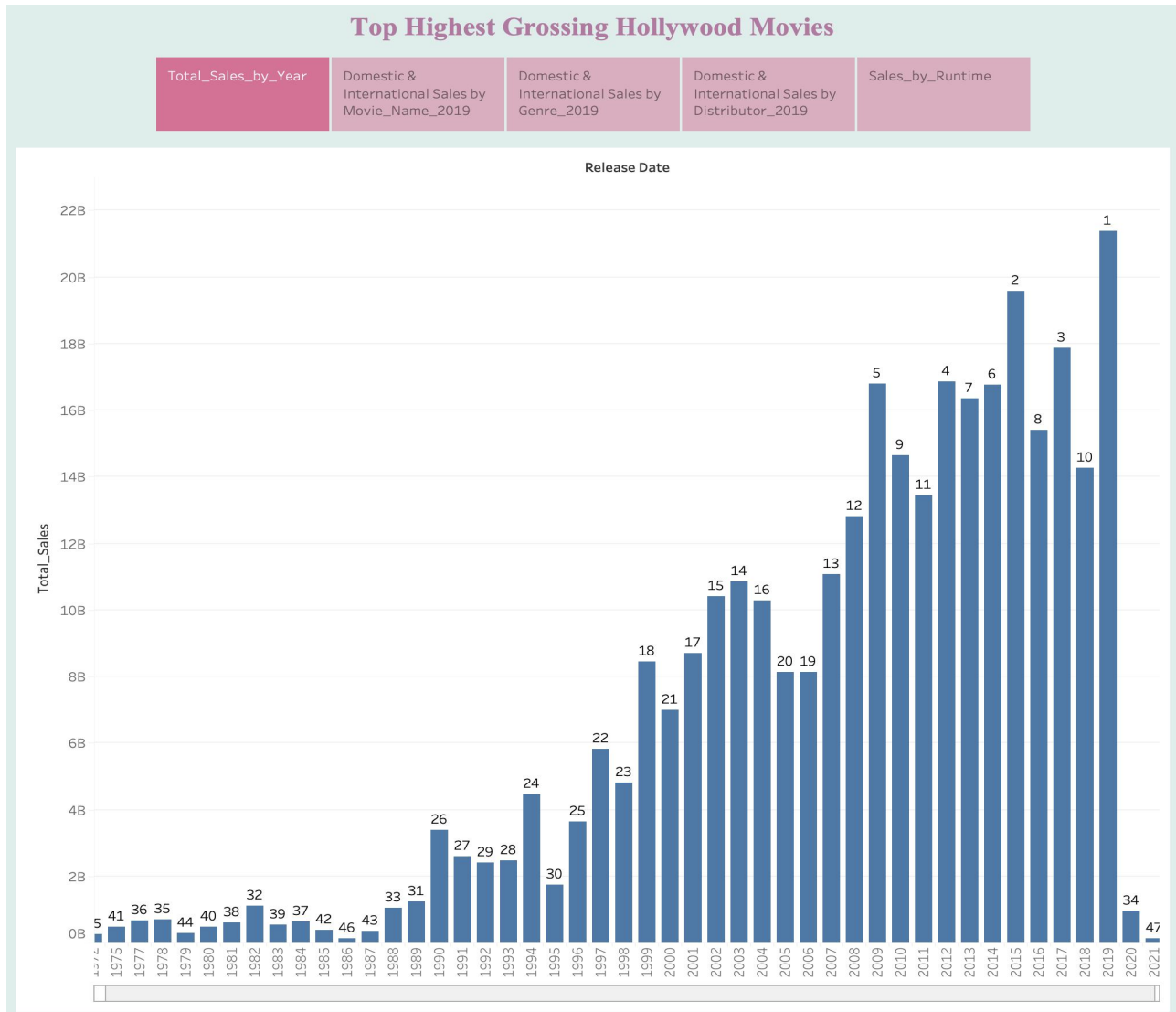
Dashboard



Used: [Type of Histogram, Calculated Field, Dates, Rank, Group]

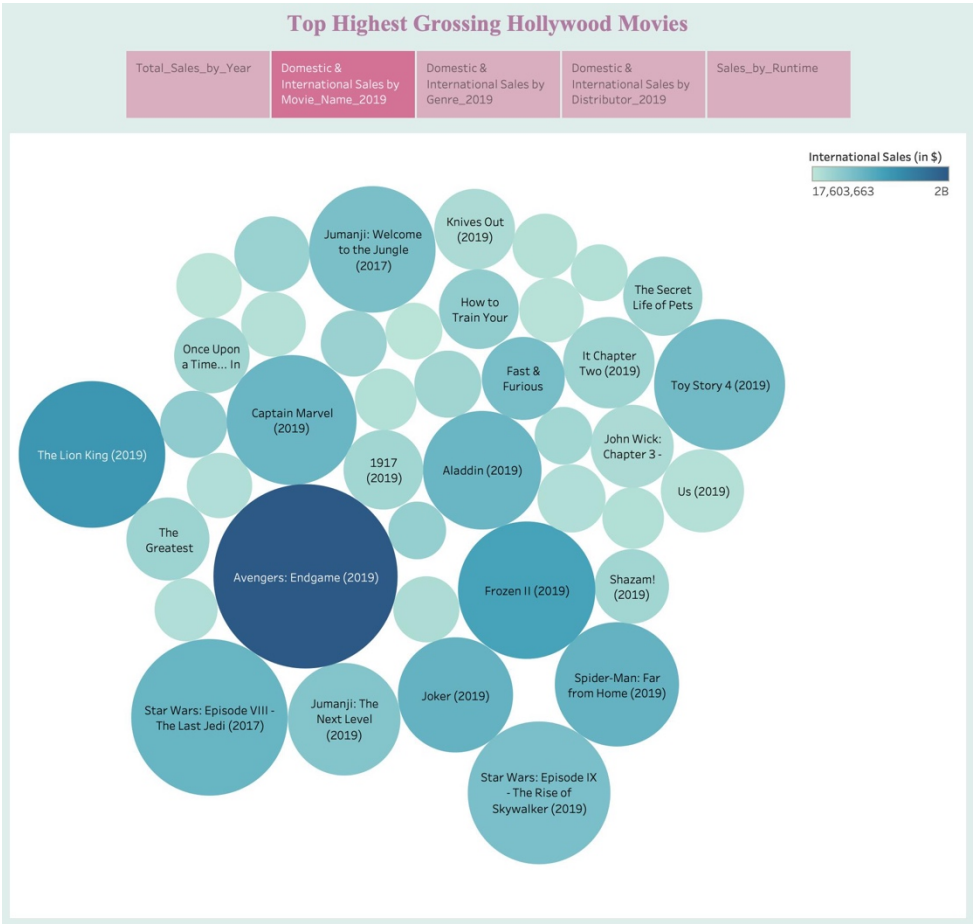
In this dashboard the first graph talks about total movies released in a year. The second graph drill down the movie released in each month of a given year and ranked the total sales of that movies. 3rd graph gives you the view of movies titles released in that year I have used bubble chart in this view where color represents international sales and size represent domestic sales. On the last chart I have grouped movies by production houses and aggregated total they made each year. I have added a filter where you can select a year on chart one and remaining charts will show all the sales details by month, Name, and distributor.

Story Telling

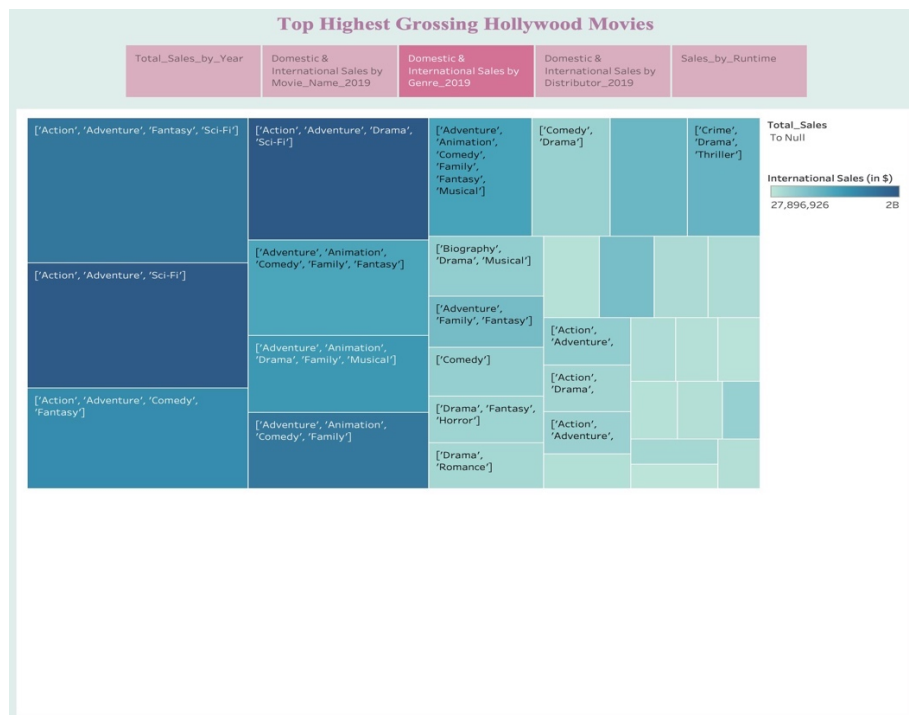


As shown in the above chart, I have organized the data as follows: Total Sales on the Y-axis and Year on the X-axis. For a clear understanding of each year's sales, I have also ranked them. This gives me an idea of the year with the highest sales, and that year is 2019. The year 2019 will be

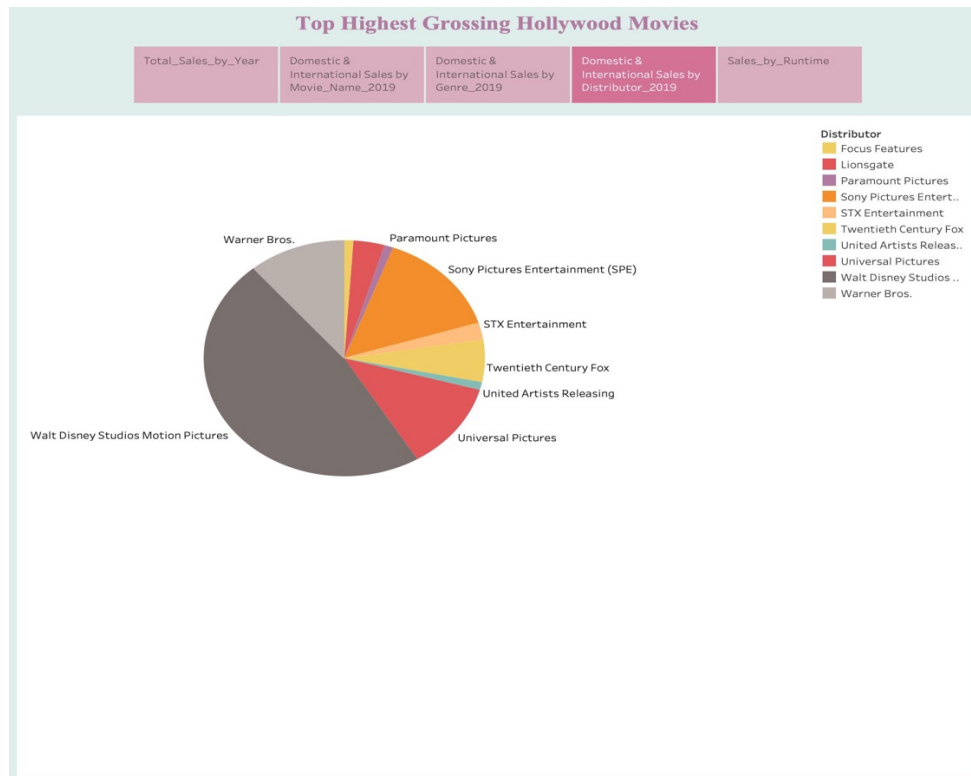
the subject of my story in more detail. Additionally, I noticed that the year 2021 had the lowest sales in comparison to the last 25-30 years. The 2021 film industry has been adversely affected by COVID, therefore sales in that year have decreased significantly.



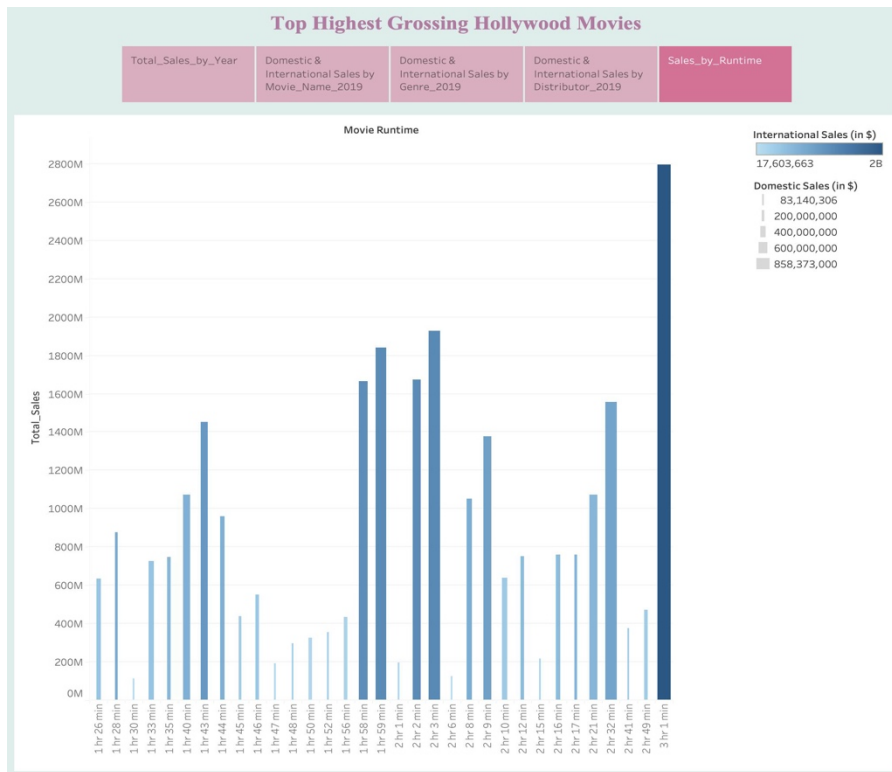
In the following analysis, I have taken both domestic and international sales for the year 2019 and connected them with movies to determine which movie had the highest sales in 2019. Avengers: Endgame was the most successful title in 2019, helping the year be among the topmost successful years in terms of sales. In the chart, the size of the bubble indicates domestic sales, and the color indicates international sales. The titles are determined by the sales of the movie. Additionally, there are a few movies such as The Lion King, Frozen, Star Wars, Joker, and Aladdin which made the highest domestic sales and made it to the top of the list.



I have noted above in my analysis that a movie's genre plays a significant role in its sales. I have arranged my data in the chart in such a way that I may be able to gain a better understanding of what types of movies are released more frequently in the year 2019, which helped make it the most successful. The chart indicates domestic sales by size and international sales by color. According to the results, genres such as Action, Adventure, Sci-Fi, Animation, and Drama are likely to increase sales. A movie's sales are not solely determined by its genre, but they are also affected by the season during which the movie was released. This is because the holiday season is always a good time to release movies. I was able to determine that June and December will be the months when film sales will be at their highest.



There is one area of my data that I want to go deeper into. The distributors are the backbone of a movie. For this reason, I wanted to see who the top distributors are for this success story to be shared. In contrast to other distributors, I was amazed to see that Walt Disney had fared better than the other distributors when compared to the competition. Universal Pictures and Warner Brothers are in second and third place, respectively. Additionally, Walt Disney ranked first in the production of films rated PG-13, which is a general rating that appeals to the largest audience, therefore generating the most revenues for the company.



As a final point, I would like to know the run time of the movies released during the year 2019, as well as their domestic and international performance. In the chart, the size of the bar represents domestic sales, and the color of the bar represents international sales. In my chart, I have organized my data in the following manner: runtime on X-axis and total sales on Y-axis. In accordance with the report, the average running time of the movies that are part of the big sales is 3h1min. Ultimately, we could say that the year 2019 was the most successful year for the film industry with huge domestic and international sales. Even though I do not have the details of the topmost directors who are responsible for these films in my report, I would like to say that Steven Spielberg is the most successful director, and he is one of the top most directors responsible for the huge sales in the year 2019. To have a successful film, three elements are essential: securing funding for the production; securing an A-list cast that will connect with the audience; and finding a major distributor to promote the movie. There is no doubt that voting has a substantial impact on how much money a movie makes, as the votes that are cast can have a very important impact on the

nature of the movie and can restrict the market for it. To conclude, in my project I have shown the graph of the movies that are released every year, the domestic and international sales of each movie along with their genre and running time. I also explained in my analysis how genre, license, and other factors contribute to the sales of a movie and how sales are different from local to international sales.

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