

The IMDb logo is centered in the image. It consists of the letters "IMDb" in a bold, black, sans-serif font. The letters are set against a bright yellow rectangular background with rounded corners. This yellow rectangle is superimposed over a dark gray background that is densely packed with a grid of movie posters. The posters are of various sizes and colors, creating a vibrant, textured backdrop for the logo.

# IMDb





# What is IMDb?

# IMDb

What are we doing with it?

# IMDb

## Help Center

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IMDb: General Information ▼

### General Information

What is IMDb?

Why should I register on IMDb?

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IMDb login/registration issues

Why do I need to enable my cookies on IMDb?

How can I access or delete personal information IMDb stores about me?

How do I update my email address?

I never received my registration email. How do I login?

When I login it says there was a problem. How do I login?

## What is IMDb?

IMDb is the world's most popular and authoritative source for movie, TV and celebrity content, designed to help fans explore the world of movies and shows and decide what to watch.

Our searchable database includes millions of movies, TV and entertainment programs and cast and crew members. We help you jog your memory about a movie, show, or person on the tip of your tongue, find the best movie or show to watch next, and empower you to share your entertainment knowledge and opinions with the world's largest community of fans.

For fans deciding what to watch and where to watch it, we offer local movie [showtimes](#), [ticketing](#), [trailers](#), [critic and user reviews](#), [personalized recommendations](#), photo galleries, entertainment news, quotes, trivia, [box-office data](#), editorial feature sections and a universal [Watchlist](#). To learn more about watching Trailers, Clips, Featurettes, and IMDb Originals, please see the [IMDb Video FAQs](#).

IMDb creates new original video content each week including: The IMDb Show, IMDbbrief, and Casting Calls amongst other interviews and daily topical videos. You can find new videos highlighted every day on the IMDb homepage via your desktop computer or [IMDb app](#).

Certain titles in our database may be available to stream for free with ads for US customers with an IMDb account via [IMDb TV](#). Visit the [IMDb TV FAQ](#) for more information.

IMDb launched online in 1990 and has been a subsidiary of Amazon.com since 1998.



FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro | MORE

SHARE



## Jojo Rabbit (2019)

★ 8.0  
149,792★ Rate  
This

PG-13 | 1h 48min | Comedy, Drama, War | 8 November 2019 (USA)



2:18 | Trailer

32 VIDEOS | 151 IMAGES

## In Theaters Now

A young boy in Hitler's army finds out his mother is hiding a Jewish girl in their home.

**Director:** Taika Waititi**Writers:** Taika Waititi (screenplay), Christine Leunens (novel)**Stars:** Roman Griffin Davis, Thomasin McKenzie, Scarlett Johansson | [See full cast & crew »](#)

See Showtimes

+ Add to Watchlist

58

Metascore

From metacritic.com

Reviews

1,015 user | 358 critic



Popularity

7 (↑ 3)

## Sam Heughan Creates Jamie Fraser's Dating Profile



The "Outlander" star brings his character into the most dangerous situation yet: the world of online dating.

[Watch the video »](#)

## Related News

[TVLine Items: Isla Fisher Is Guilty Party, New Divorce Court Judge and More](#)  
05 March 2020 | TVLine.com

[Taika Waititi To Write & Direct Two Animated 'Charlie & The Chocolate Factory' Series For Netflix](#)  
05 March 2020 | The Playlist

[Taika Waititi to Create Two Charlie and the Chocolate Factory Animated Series for Netflix](#)  
05 March 2020 | TVGuide - Breaking News

Information of the base



# Quick Glossary

So you know what are we talking about

# IMDb

## Help Center

🔍 How can we help?

### Box Office by IMDbPro Glossary

#### Box office tracking

**Box office tracking** refers to theatrical box office earnings. Additional sources of revenue, such as home entertainment sales and rentals, television rights, product placement fees, etc. are not included. Grosses published without an identified location reflect domestic earnings (i.e. United States and Canada) unless otherwise noted.

#### Production budget

**Production budget** refers to the cost to make the movie and it does not include marketing or other expenditures.

#### Gross

**Gross** refers to gross earnings in U.S. dollars. On average, a movie's distributor receives a little more than half of the final gross (often referred to as the "rentals") with the remainder going to the exhibitor (i.e. movie theater). The money split varies from movie to movie, but, generally, the contract favors the distributor in early weeks and shifts to the exhibitor later on.

This is just for you to know where the gross comes from. They track the box office earnings and sum them to generate the gross income.

For the purpose of this analysis we are going to assume that the budget is the whole expense, we want to know if the movie made it or break it

For Gross Income, we considered all the data instead of just half, since we don't know how much of that half is for the distributor and in simple numbers we wanted to know if the movie 'made' money or loss it.



# HOW WE CREATE THE METAScore MAGIC

[About Metacritic](#) | 
 [About Metascores](#) | 
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## A PEEK BEHIND THE CURTAIN

Creating our proprietary Metascores is a complicated process. We carefully curate a large group of the world's most respected critics, assign scores to their reviews, and apply a weighted average to summarize the range of their opinions. The result is a single number that captures the essence of critical opinion in one Metascore. Each movie, game, television show and album featured on Metacritic gets a Metascore when we've collected at least four critics' reviews.

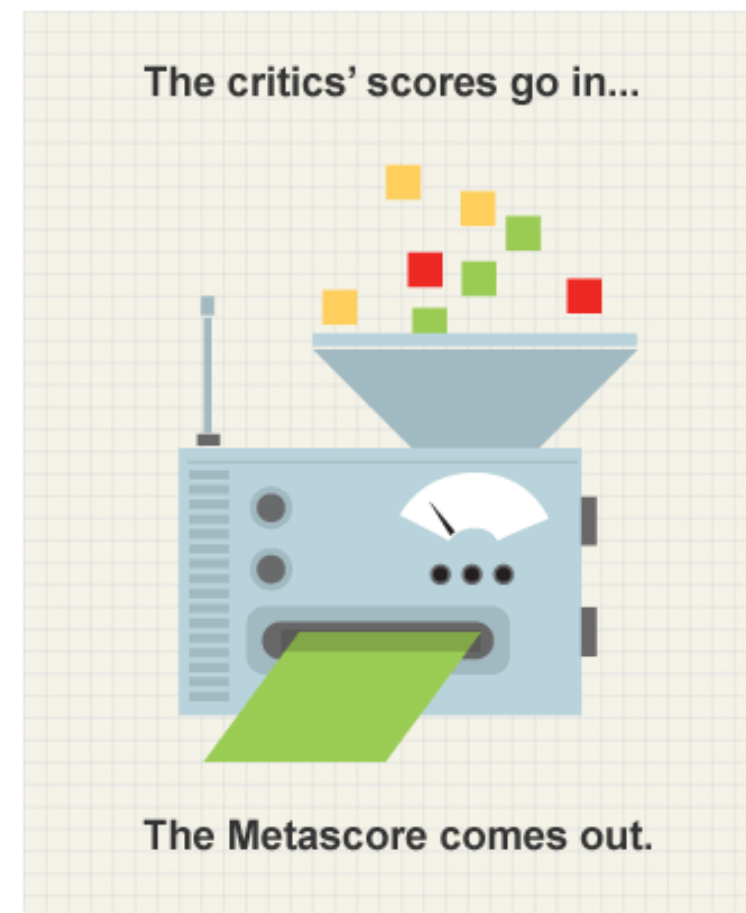
## WHY THE TERM "WEIGHTED AVERAGE" MATTERS

Metascore is a weighted average in that we assign more importance, or weight, to some critics and publications than others, based on their quality and overall stature. In addition, for music and movies, we also normalize the resulting scores (akin to "grading on a curve" in college), which prevents scores from clumping together.

## HOW TO INTERPRET A METAScore

Metascores range from 0-100, with higher scores indicating better overall reviews. We highlight Metascores in three colors so that you can instantly compare: green scores for favorable reviews, yellow scores for mixed reviews, and red scores for unfavorable reviews.

... in more simple words, the metascore is a normalize weighted average of the critics score (at least 4 critics to generate the metascore)



# Question #1: Who are tougher reviewers with their ratings, the viewers or the critics?



The old debate will finally be decided



# But first... what do we consider rating?

- Viewer Ratings
  - “Weighted Average Vote” of all viewer ratings for a specific movie
- Critic Ratings
  - Weighted score based on IMDb’s “Metascore” methodology



# Ratings

## User

- IMDb registered users can cast a vote (range from 1 to 10).
- Individual votes are aggregated and summarized as a single IMDb rating.
- There is only one vote per title per user.

## Critics ([Metascore in glossary](#))

- IMDb assigns more importance, to some critics and publications, based on quality and overall stature.
- A movie gets a Metascore when at least four critics review that movie.
- Range from 0-100.
- IMDb normalizes the resulting scores (akin to "grading on a curve" in college), which prevents scores from clumping together.



# Data Cleaning

```
Out[91]: title      81273  
         avg_vote   81273  
         metascore  12722  
         reviews_from_users  74196  
         reviews_from_critics 70286  
         year       81273  
         dtype: int64
```



```
Out[92]: title      12662  
         avg_vote   12662  
         metascore  12662  
         reviews_from_users  12662  
         reviews_from_critics 12662  
         year       12662  
         dtype: int64
```

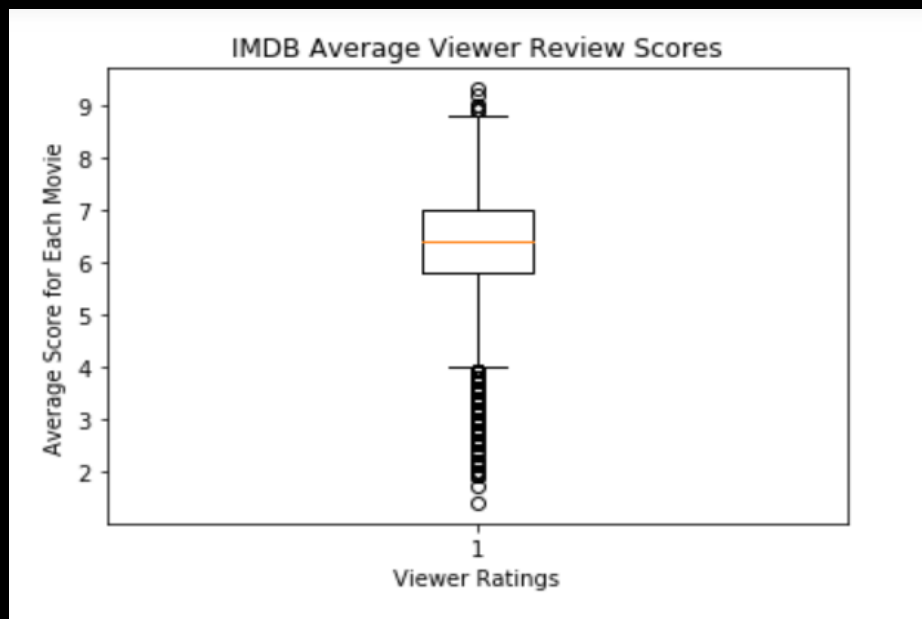
- only 74,196 of the total movies listed in IMDB have been reviewed by viewers
- only 70,286 have been reviewed by critics.
- ***more importantly***, only 12,722 movies have been given a metascore

	Mean Rating	Median Rating	Rating Variance	Rating Std Dev	Rating SEM
avg_vote	6.35	6.4	0.95	0.97	0.01
metascore	55.77	56.0	314.90	17.75	0.16

	Total # of Reviews	Mean # of Reviews	Median # of Reviews	Reviews Volume Variance	Reviews Volume Std Dev	Reviews Volume SEM
reviews_from_users	2269464.0	179.23	71.0	122881.87	350.55	3.12
reviews_from_critics	1286996.0	101.64	66.0	11274.84	106.18	0.94

- **# of Reviews:** Greater numbers of overall user reviews than critic reviews, but more consistency in the number of critic reviews of any given movie received vs. the number of user reviews each movie received.
- **Quality Ratings:** more variability in the quality ratings given to movies by critics than by users → there was more consistency among what the viewers thought of the quality of the movie than what the critics thought.

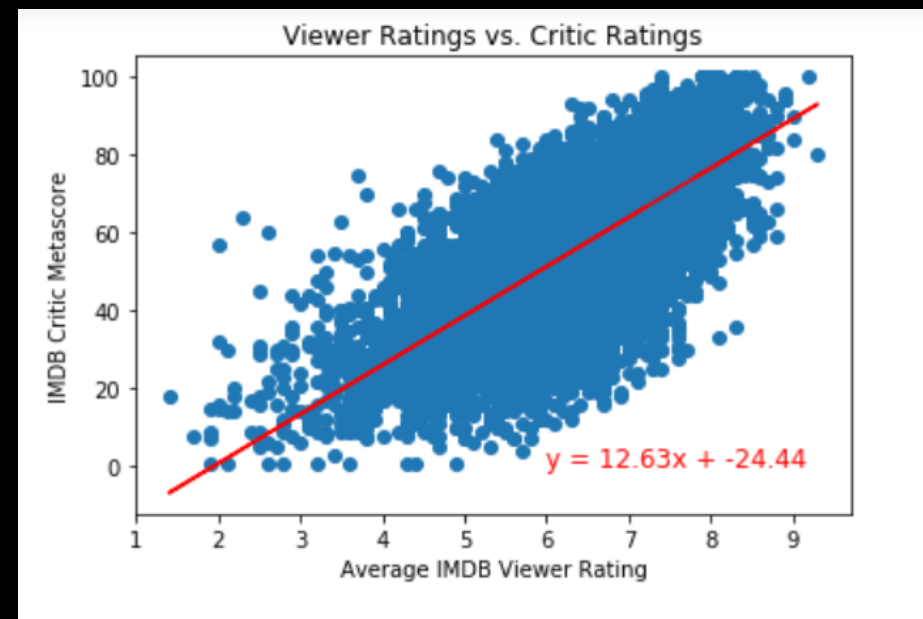
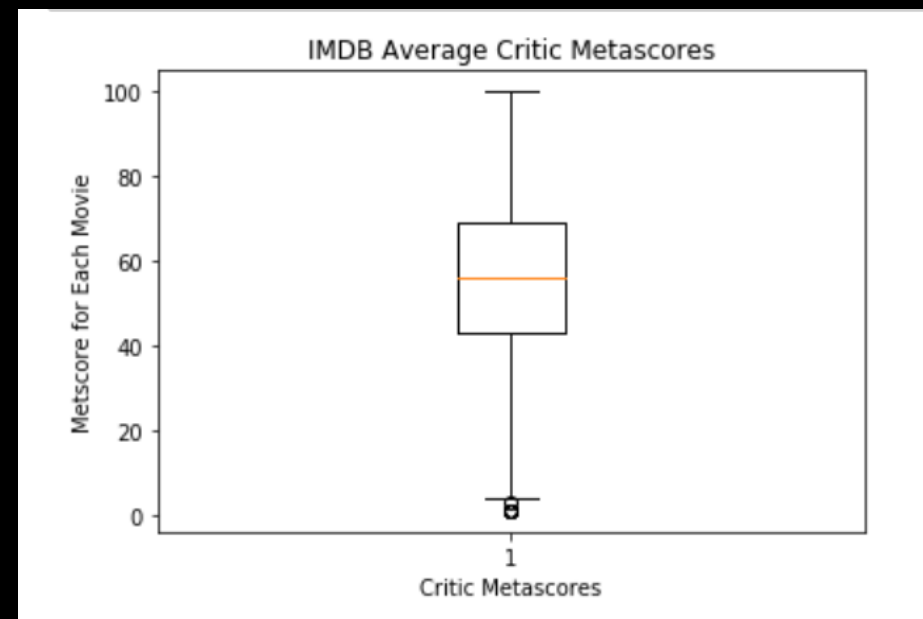




Lower Quartile of Viewer Reviews: 5.8  
 Upper Quartile of Viewer Reviews: 7.0  
 Viewer Review IQR: 1.2  
 Outliers: below 4.0 or above 8.8

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Lower Quartile of Critic Metascores: 43.0  
 Upper Quartile of Critic Metascores: 69.0  
 Critic Metascore IQR: 26.0  
 Outliers: below 4.0 or above 108.0



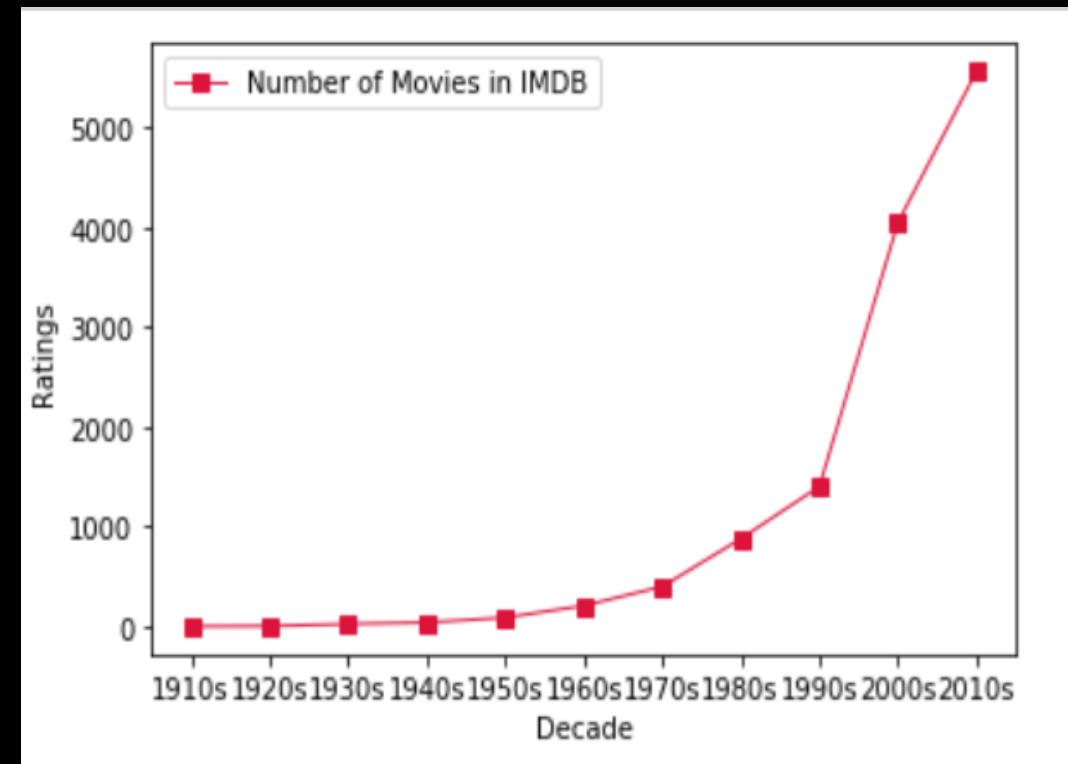
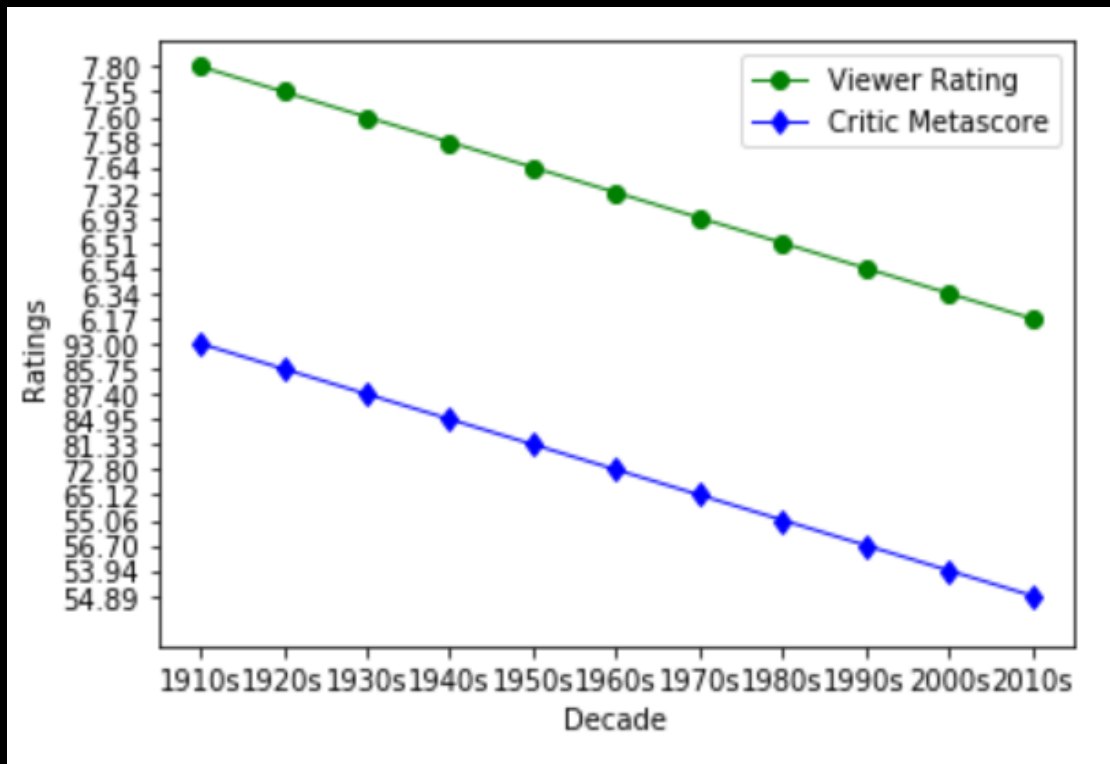
# Viewers vs. Critics: Summary

- Overall, there is a positive correlation between higher viewer scores and critic metascores.
- With the metascore methodology applied by IMDB, critic metascores are already normalized (i.e. adjusted to a normal curve).
- Viewer ratings are scaled from 1-10, metascores are scaled 1-100
  - Not be directly comparable without additional statistical analysis.
  - If we compare ave metascore relative to its range (1-100) to the ave voter score relative to its range (1-10), viewers do seem to rate movies overall slightly more favorably than critics.



# Viewer Ratings by film production year

Decade	Average Viewer Rating	Average Critic Metascore	Ave # Viewer Reviews per movie	Ave # Critic Reviews per movie	Number of Movies
1910s	7.80	93.00	105.00	77.00	1
1920s	7.55	85.75	231.00	83.75	4
1930s	7.60	87.40	252.24	100.92	25
1940s	7.58	84.95	253.51	92.92	39
1950s	7.64	81.33	200.39	85.40	89
1960s	7.32	72.80	182.25	74.41	208
1970s	6.93	65.12	176.79	77.35	400
1980s	6.51	55.06	154.97	69.39	880
1990s	6.54	56.70	209.16	68.63	1403
2000s	6.34	53.94	204.42	97.89	4050
2010s	6.17	54.89	156.04	120.90	5563



- Both viewers and critics rated movies from 1960s and earlier higher.
- Majority of the movies in IMDB were made in the 1970s and afterwards.
- It could be that the better the quality of movies made before 1970, the more likely it is to be listed and reviewed on IMDB.

# Top Movies

## Viewers

title	Average Viewer Rating
The Shawshank Redemption	9.3
The Godfather	9.2
The Godfather: Part II	9.0
The Dark Knight	9.0
Schindler's List	8.9

## Critics

title	Average Viewer Rating
Sweet Smell of Success	8.1
The Wizard of Oz	8.0
Boyhood	7.9
Au hasard Balthazar	7.9
Rear Window	8.4

## Viewers

Average Viewer Rating	Average Metascore	Average # Viewer Reviews per movie	Average # Critic Reviews per movie	Average Year of Release
8.525	81.76	1444.18	245.75	1990.8

## Critics

Average Viewer Rating	Average Metascore	Average # Viewer Reviews per movie	Average # Critic Reviews per movie	Average Year of Release
7.989	96.58	542.83	211.76	1973.07



# Worst Movies

## Viewers

title	Average Viewer Rating
Saving Christmas	1.4
The Price of Air	1.7
Superbabies: Baby Geniuses 2	1.9
Disaster Movie	1.9
The Singing Forest	1.9

## Critics

title	Average Viewer Rating
Bio-Dome	4.4
United Passions	2.1
InAPProPriaTe Comedy	2.8
10 Rules for Sleeping Around	3.6
The Garbage Pail Kids Movie	2.6

## Viewers

Average Viewer Rating	Average Metascore	Average # Viewer Reviews per movie	Average # Critic Reviews per movie	Average Year of Release
2.812	22.72	152.69	46.77	2007.04

## Critics

Average Viewer Rating	Average Metascore	Average # Viewer Reviews per movie	Average # Critic Reviews per movie	Average Year of Release
4.086	8.99	131.52	46.9	2004.52

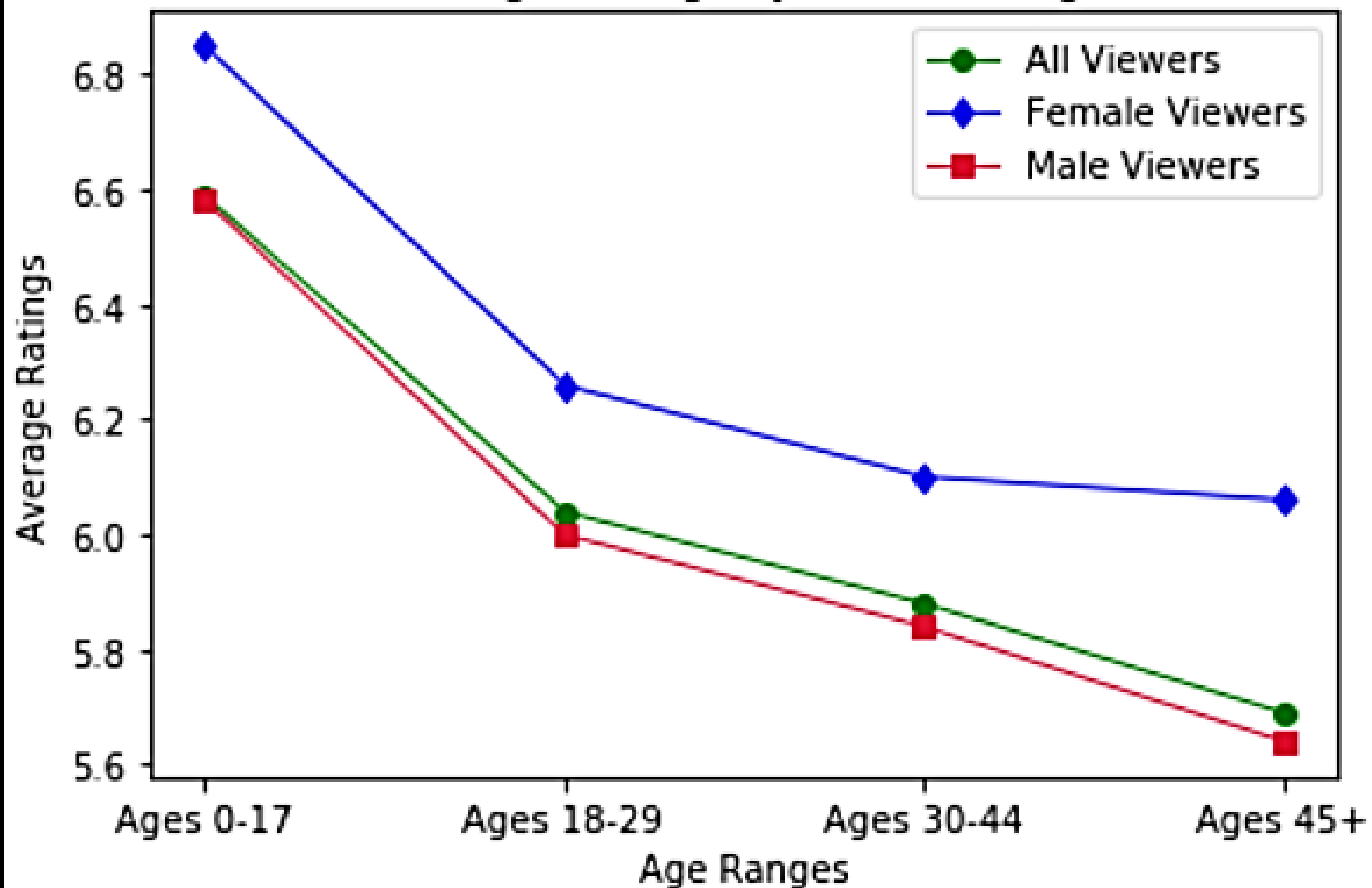
# Viewers ratings by Gender

Ave Rating Overall	5.93
Ave Female Rating	6.06
Ave Male Rating	5.85



	Ave Overall	Female Ave Rating	Male Ave Rating
Ages 0-17	6.59	6.85	6.58
Ages 18-29	6.04	6.26	6.00
Ages 30-44	5.88	6.10	5.84
Ages 45+	5.69	6.06	5.64

Average Ratings by Gender & Age





# Viewers Ratings: US vs. Non-US

- Females viewers rate movies slightly more favorably than male viewers. This trend is consistent across all age ranges when the data are divided by age.
- Older viewers (both male and female) consistently give less favorable ratings than viewers younger than them.
- Average ratings from US viewers trend slightly higher than for viewers in other countries.

Ave US Voter Rating	5.97
Ave non-US Voter Rating	5.78

# Question #2:

## Is the success of a movie related to the director?

Let's see directors with more than 1 movie



# But first... what is success?

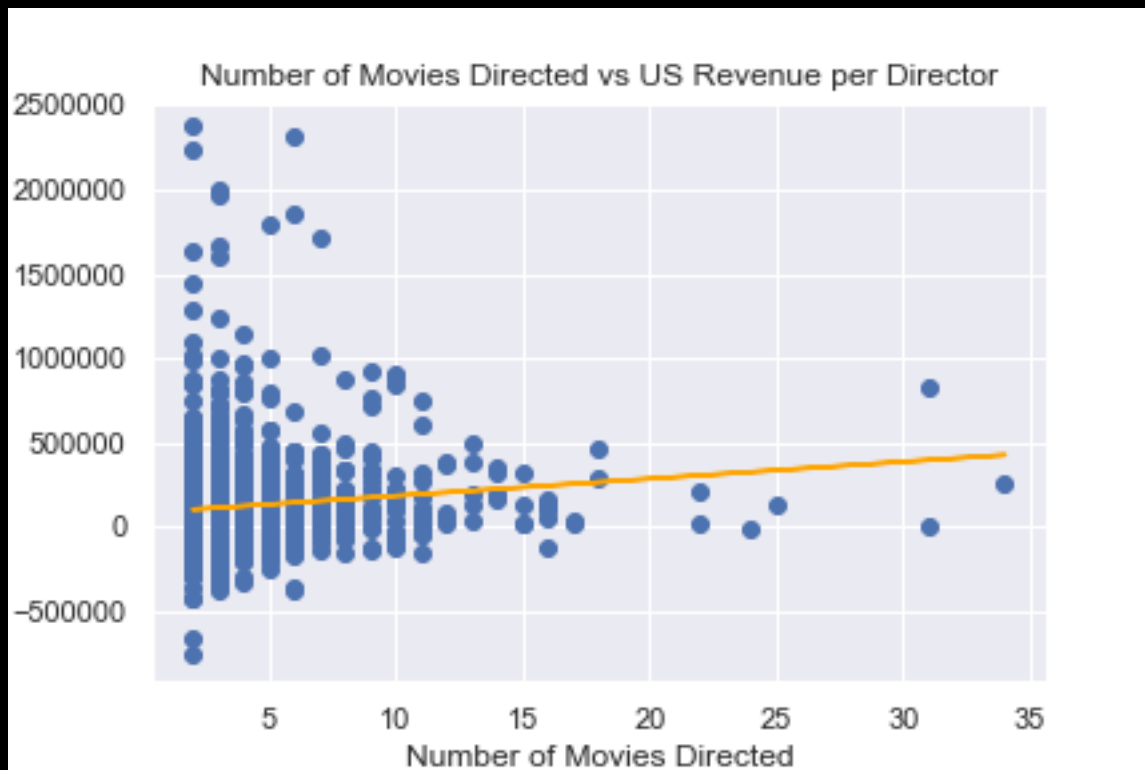
- Revenue: We want to know if a movie made money or lose it.
  - US Gross income – budget
  - Worldwide Gross income – budget
- Users ratings: We base it on user ratings considering that is the people who at the end of the day pays to see the movie.
  - US
  - Worldwide





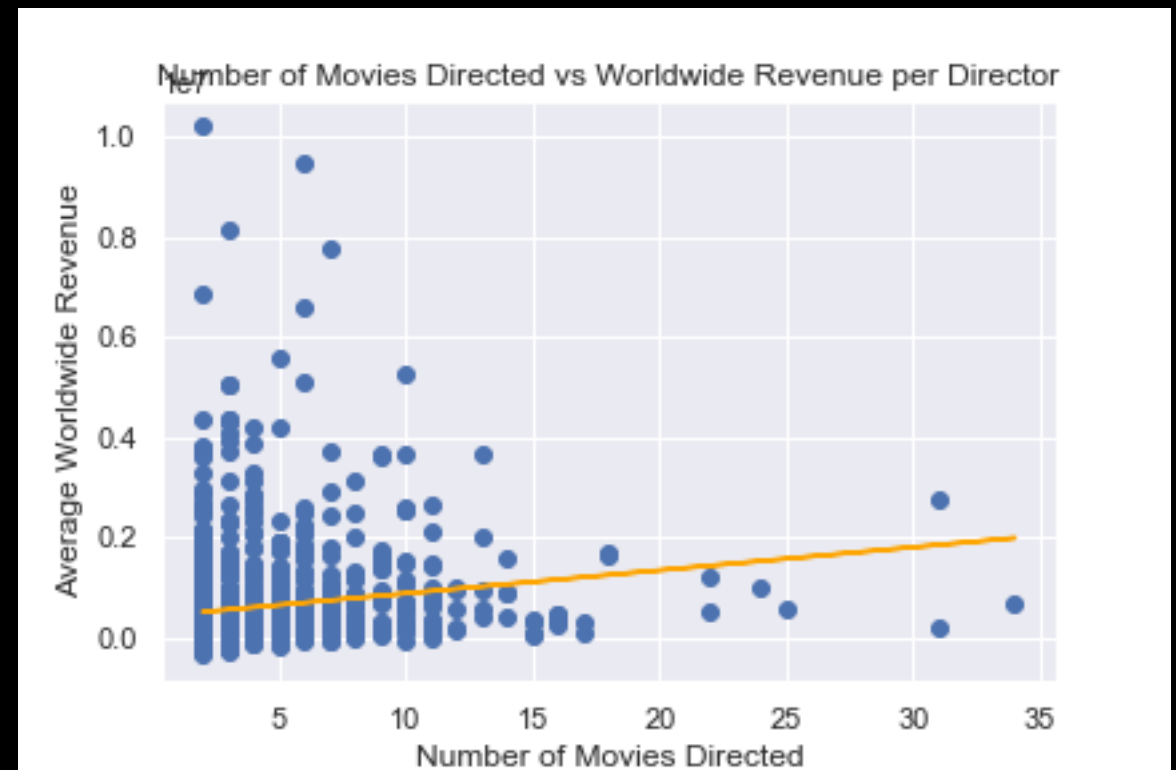
# Number of movies vs Revenue

## US



The correlation between the number of movies directed and the average revenue in US is 0.11

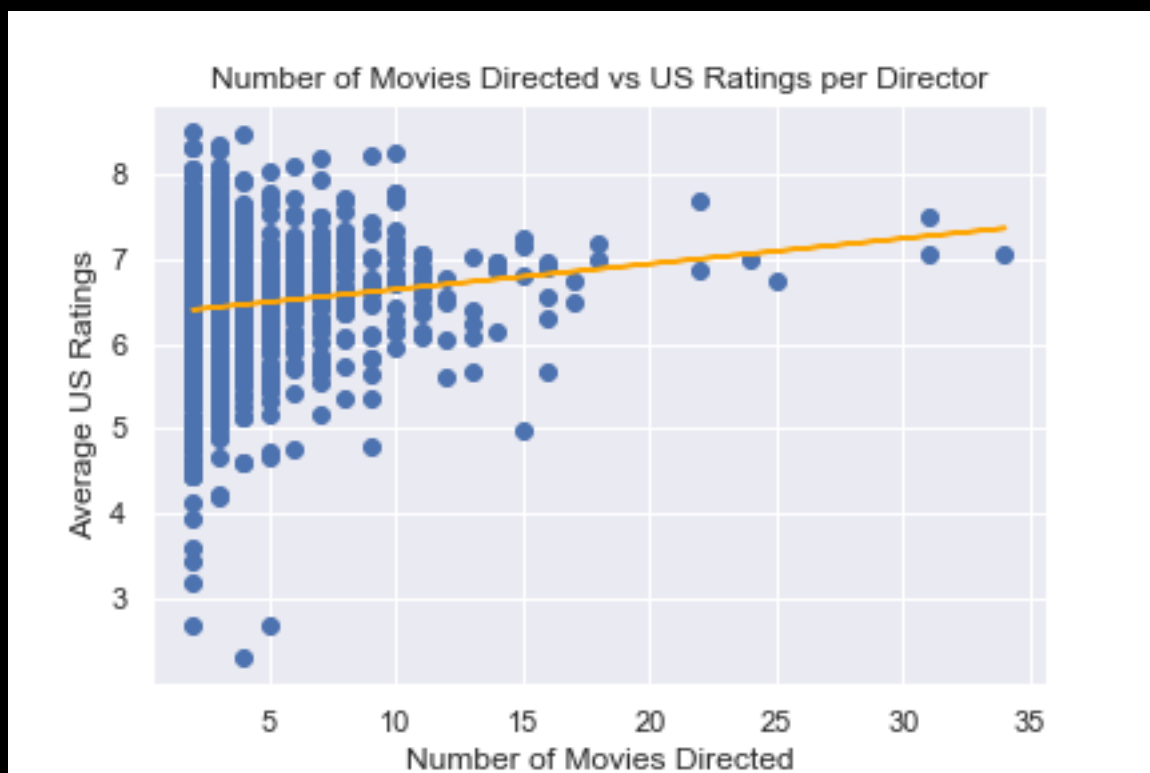
## Worldwide



The correlation between the number of movies directed and the average revenue Worldwide is 0.15

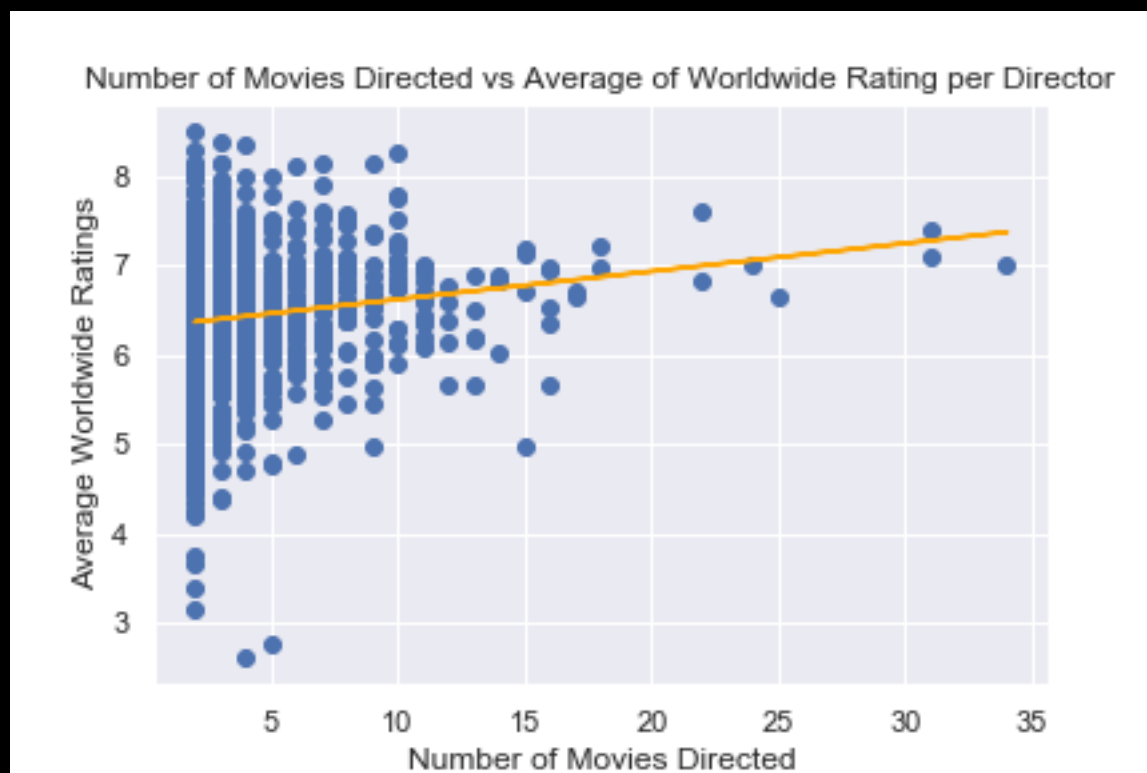
# Number of movies vs Rating

## US



The correlation between the number of movies directed and the average US Ratings is 0.13

## Worldwide



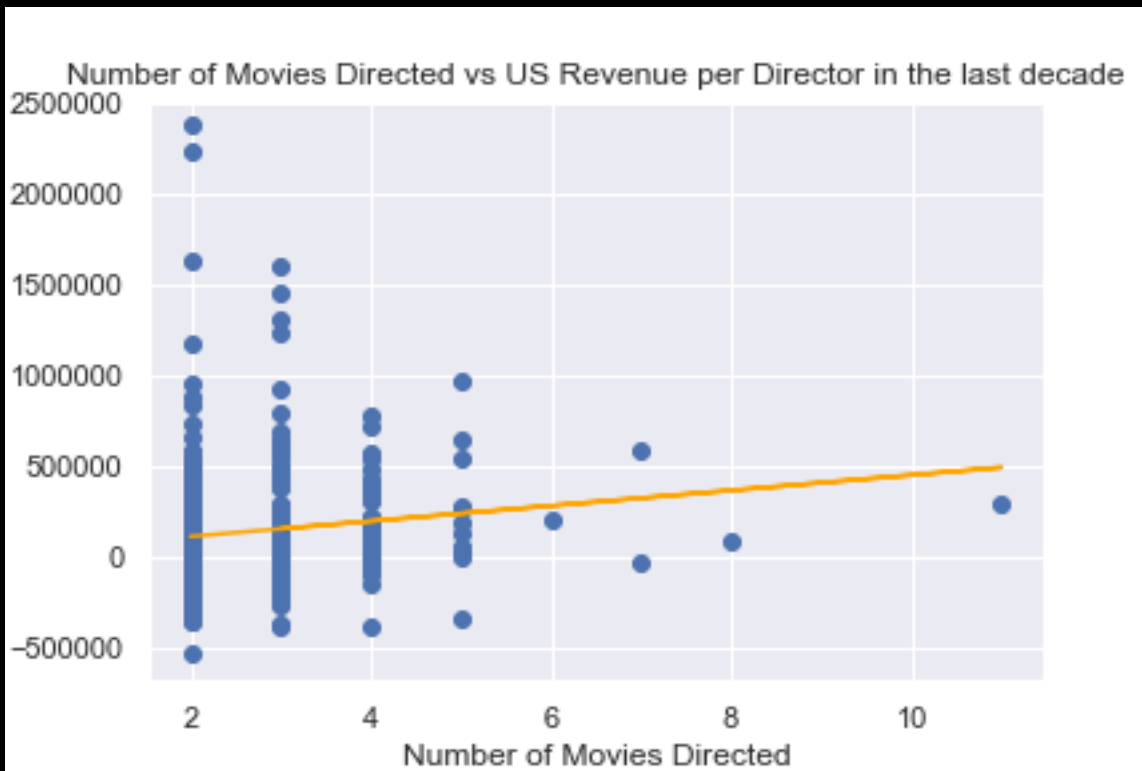
The correlation between the number of movies directed and the average Worldwide Ratings is 0.14

**NADA.**



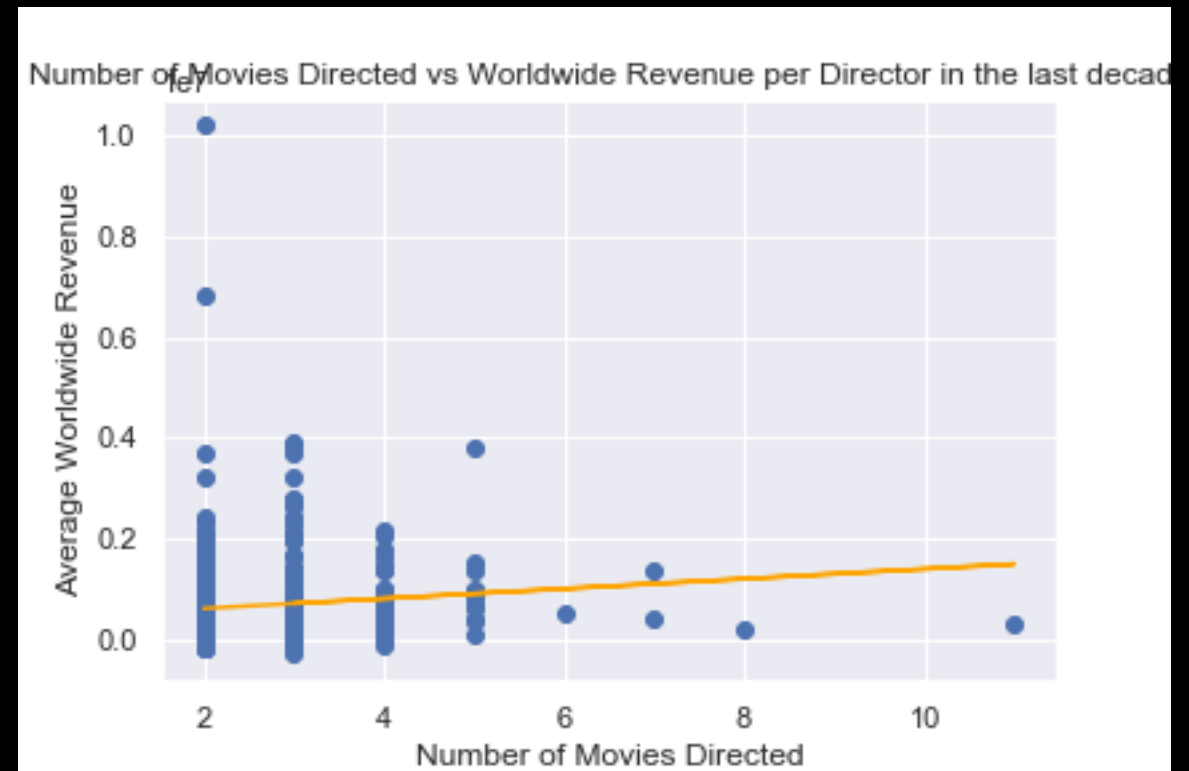
# Number of movies vs Revenue in the last decade

## US



The correlation between the number of movies directed and the average revenue in US is 0.13

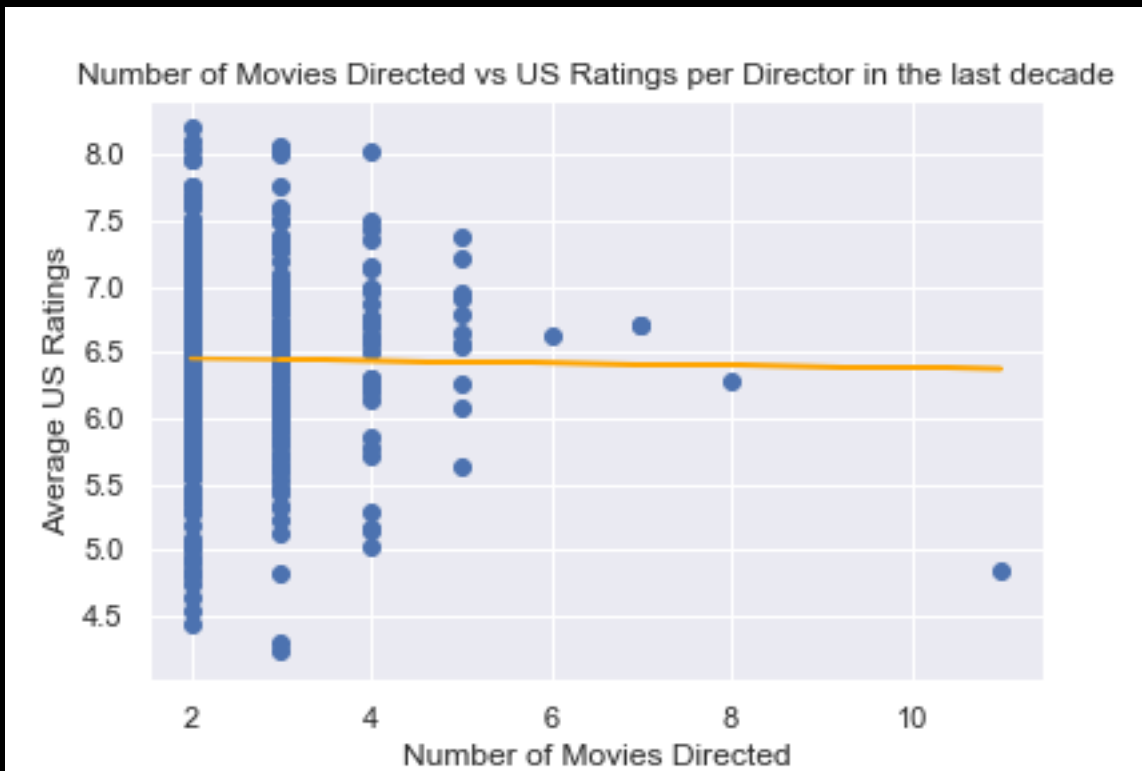
## Worldwide



The correlation between the number of movies directed and the average revenue Worldwide is 0.1

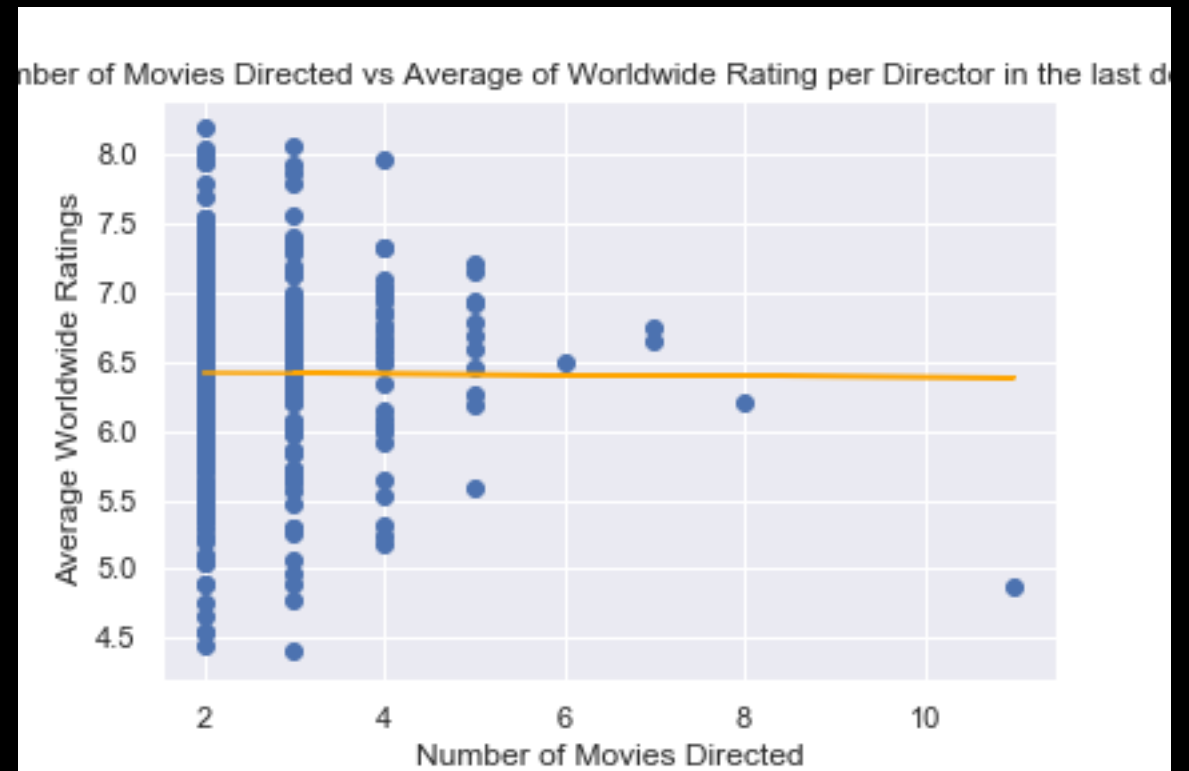
# Number of movies vs Ratings in the last decade

## US



The correlation between the number of movies directed and the average US Ratings is  $-0.01$

## Worldwide



The correlation between the number of movies directed and the average Worldwide Ratings is  $-0.01$



# Quick recap

- There is no correlation between the director and the success of a movie.
- As an exercise we reviewed the top directors in movies directed, revenue us/worldwide and ratings us/worldwide.
  - None of them are the same

Director	Director	Director	Director	Director	US Revenue	WW Revenue	US Ratings	WW Ratings	# of Movies made
Clint Eastwood	Pierre Coffin, Chris Renaud	Kyle Balda, Pierre Coffin	Charles Chaplin	Charles Chaplin	-14,086.21	-12,610.83	8.5	8.5	2
Steven Spielberg	George Lucas	Anthony Russo, Joe Russo	Alfred Hitchcock	Sergio Leone	175,333.3	175,895.8	8.33	8.37	3
Woody Allen	Kyle Balda, Pierre Coffin	Joss Whedon	Sergio Leone	Alfred Hitchcock	176,990.4	177,861.8	8.45	8.35	4
Steven Soderbergh	Joss Whedon	James Cameron	Victor Fleming, George Cukor	Giuseppe Tornatore	-7,176.775	-5,937.345	8.05	8.3	2
Ridley Scott	Ryan Coogler	Pierre Coffin, Chris Renaud	Orson Welles	Christopher Nolan	901,595.2	3,651,896	8.23	8.25	10
Ron Howard	Anthony Russo, Joe Russo	David Yates	David Lean	Thomas Vinterberg	-14,152.34	66,492.4	8	8.15	2
Martin Scorsese	J.J. Abrams	J.J. Abrams	Akira Kurosawa	Orson Welles	10,821.86	11,061.64	8.3	8.15	2
Robert Zemeckis	James Cameron	Peter Jackson	Christopher Nolan	Quentin Tarantino	422,110.4	1,642,625	8.2	8.14	9
Tim Burton	Colin Trevorrow	George Lucas	Quentin Tarantino	Stanley Kubrick	147,474.5	3,12,931	8.17	8.14	7
Brian De Palma	Jordan Peele	Eric Darnell, Tom McGrath	Stanley Kubrick	David Lean	517,427.8	519,431.5	8.3	8.13	3
Spike Lee	Andy Muschietti	Colin Trevorrow	Franklin J. Schaffner	Akira Kurosawa	-31,891.47	-31,749.35	8.27	8.13	3
Joel Schumacher	Patty Jenkins	David Leitch	Hayao Miyazaki	Hayao Miyazaki	-114,456	1,593,997	8.08	8.1	6
Barry Levinson	Joel Zwick	Ryan Coogler	Asghar Farhadi	Victor Fleming, George Cukor	1,094,444	2,108,596	8.3	8.05	2
Oliver Stone	Gareth Edwards	Dean DeBlois	Giuseppe Tornatore	Asghar Farhadi	5,345.99	95,154.01	8.05	8.05	2
Rob Reiner	Phil Lord, Christopher Miller	J.A. Bayona	Denis Villeneuve	Stephen Chbosky	585,828.8	1,531,609	7.95	8	2



# Question #3:

## Is the success of a movie related to the director's budget?

Let's think in terms of money



# General considerations of the initial data

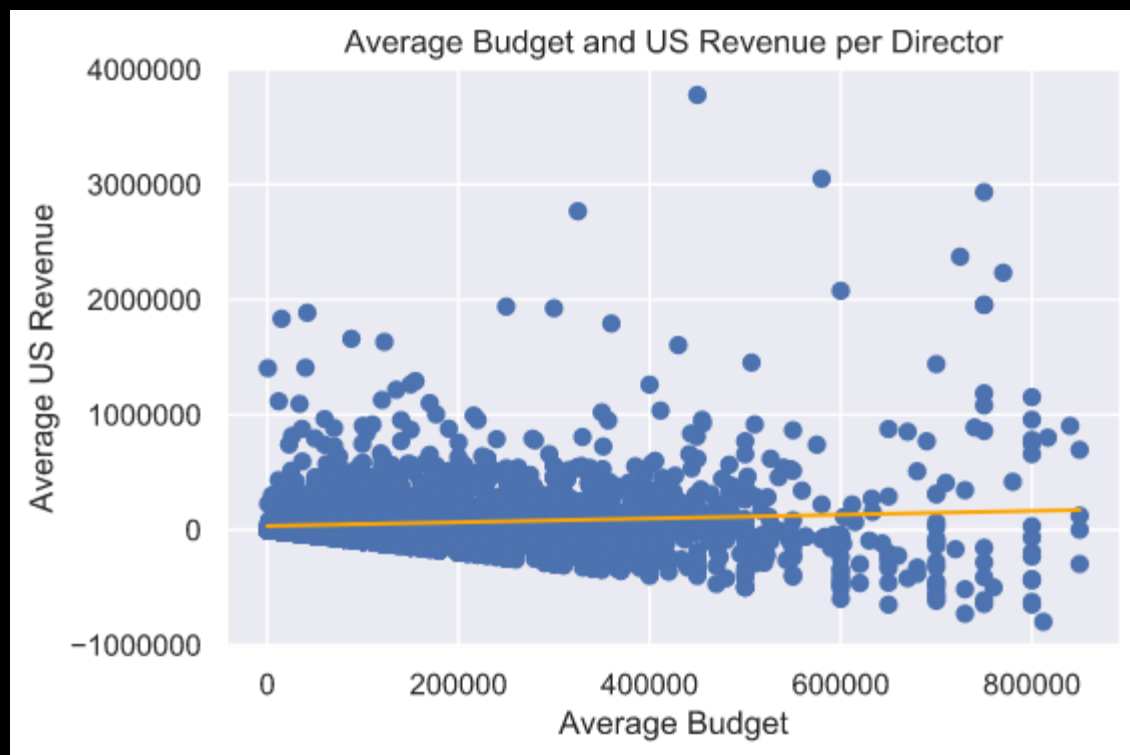
<b># Directors</b>	2,542
<b># of Movies</b>	5,400
<b>Max # Movies per Director</b>	33
<b>Years</b>	1931 to 2019
<b>Budget</b>	From \$0.2k to \$880,000k

- Deleted outliers from budget (upper)
- Only information stored in US Dollars and displayed in USD
- Information presented in thousands of dollars, to minimize 0's



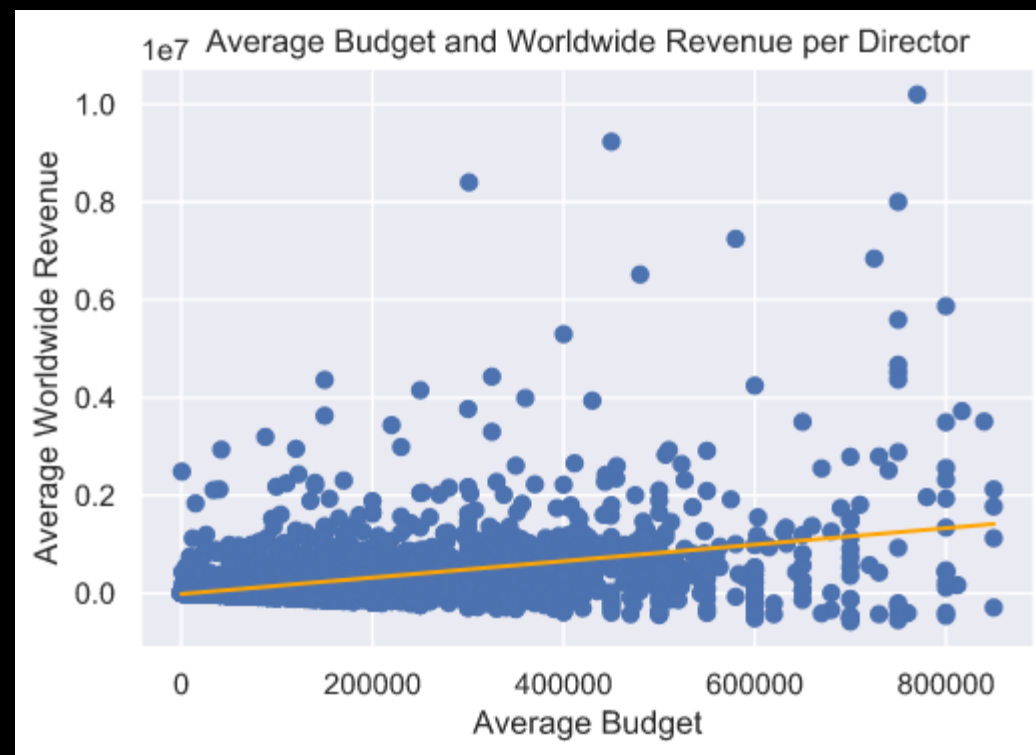
# Budget vs Revenue

## US



The correlation between the average budget and the average revenue in US is 0.1

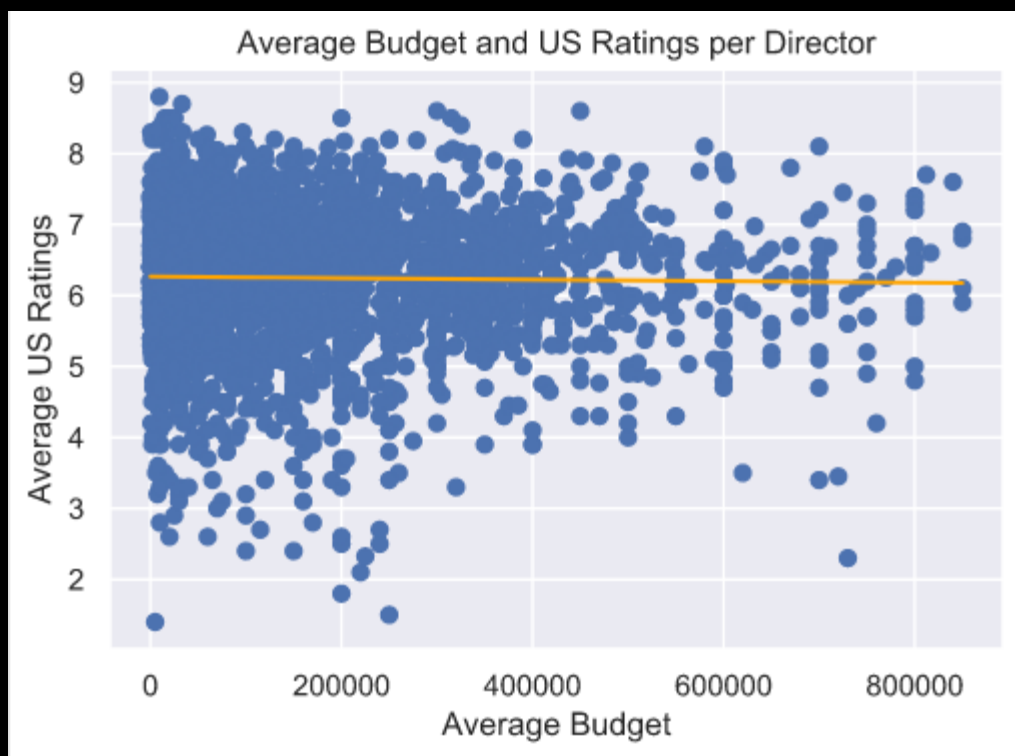
## Worldwide



The correlation between the average budget and the average revenue Worldwide is 0.4

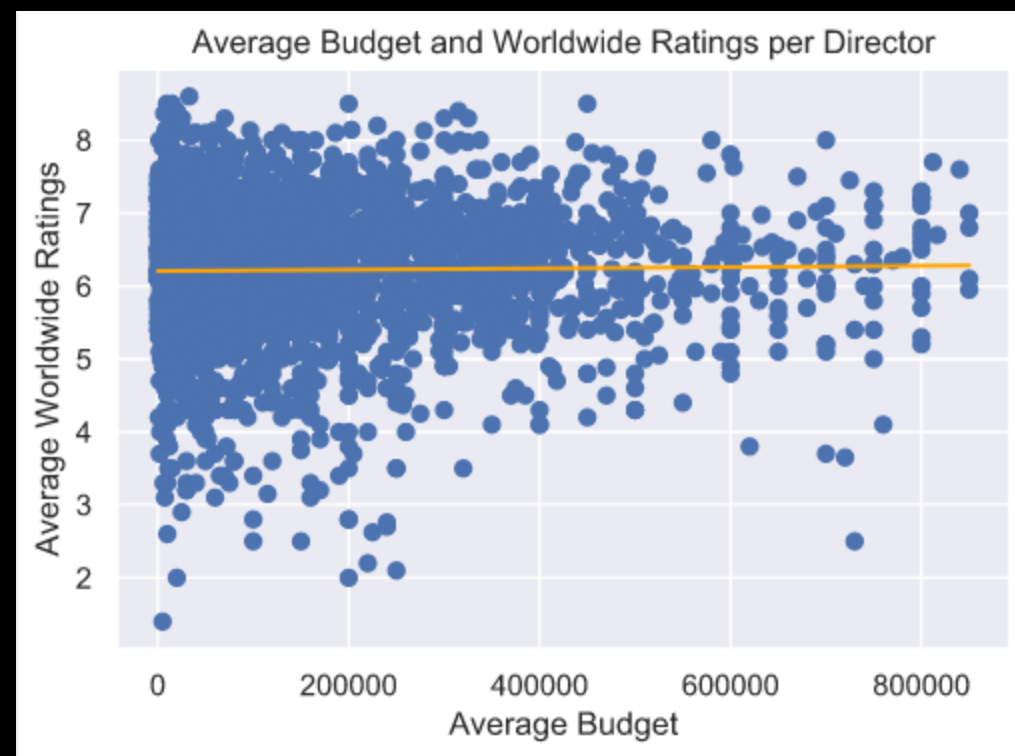
# Budget vs Ratings

## US



The correlation between the average budget and the average ratings in US is  $-0.02$

## Worldwide



The correlation between the average budget and the average ratings Worldwide is  $0.02$



# Results



- There is a mild correlation between the Budget and the Worldwide Revenue
- The rest of the information doesn't make that much of a sense
- So far, there is no correlation between the budget and ratings per director's budget.

What if...?

# General considerations of last decade

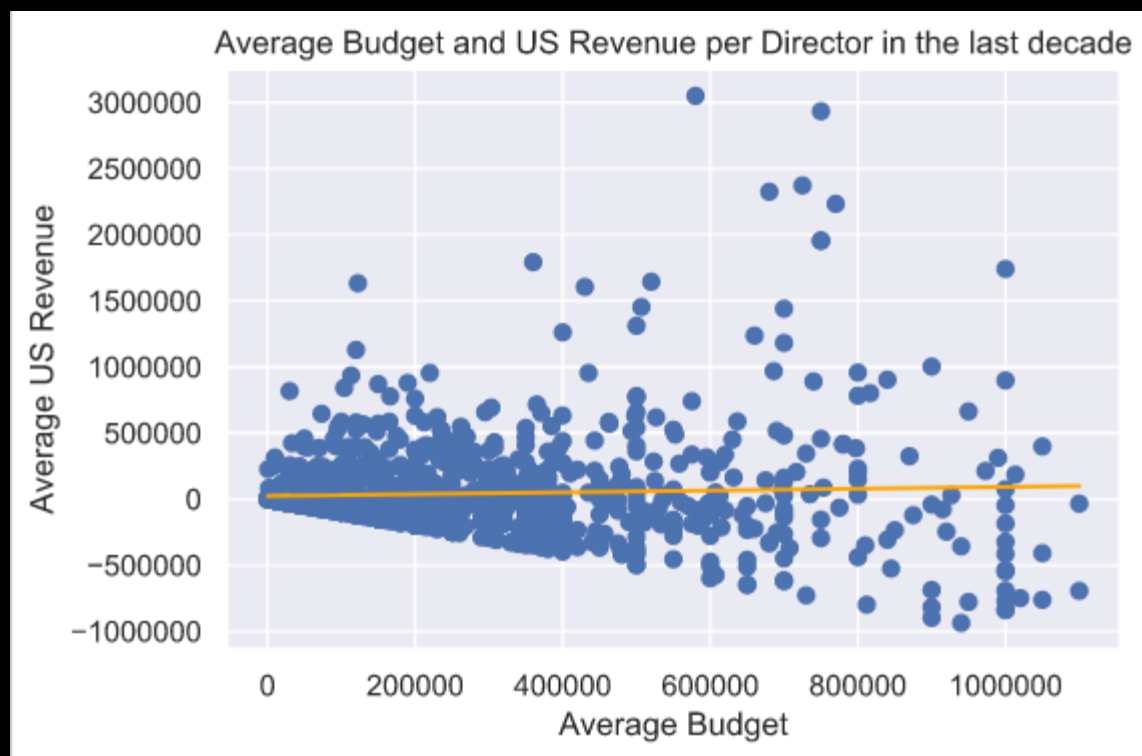
<b># Directors</b>	1,188
<b># of Movies</b>	1,752
<b>Max # Movies per Director</b>	11
<b>Years</b>	2009 to 2019
<b>Budget</b>	From \$120k to \$1,120,000k

- Deleted outliers from budget in new data (upper)
- USD and thousands of dollars



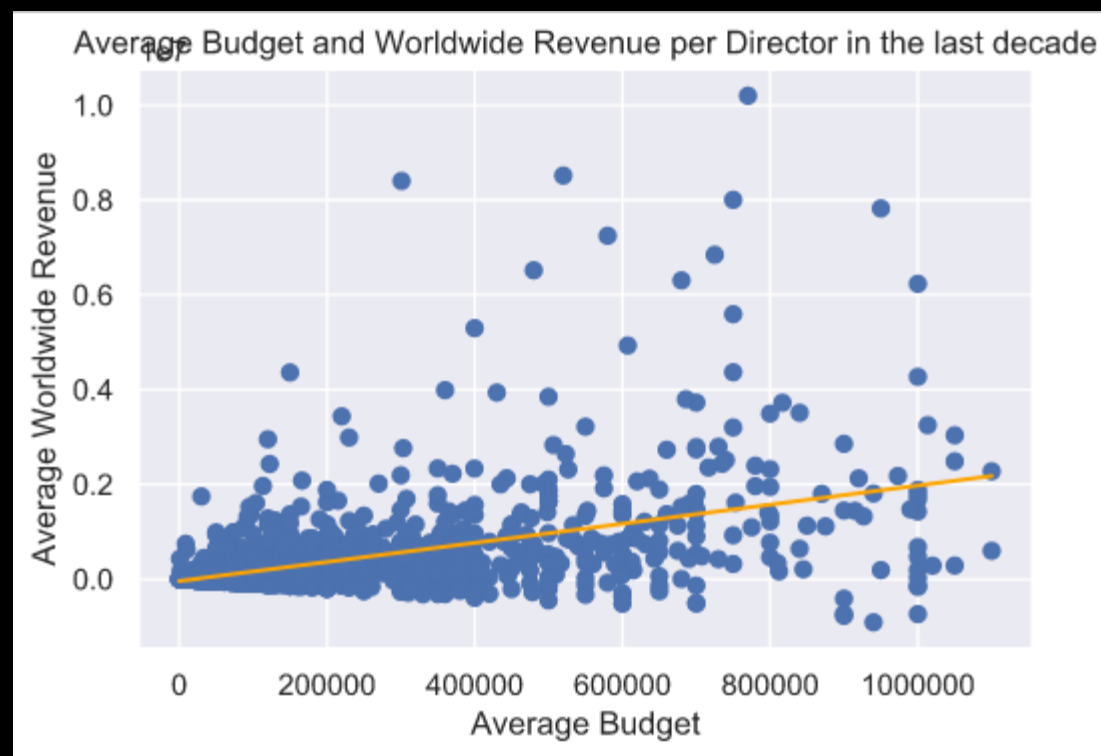
# Budget vs Revenue in the last decade

## US



The correlation between the average budget and the average revenue in US in the last decade is 0.05

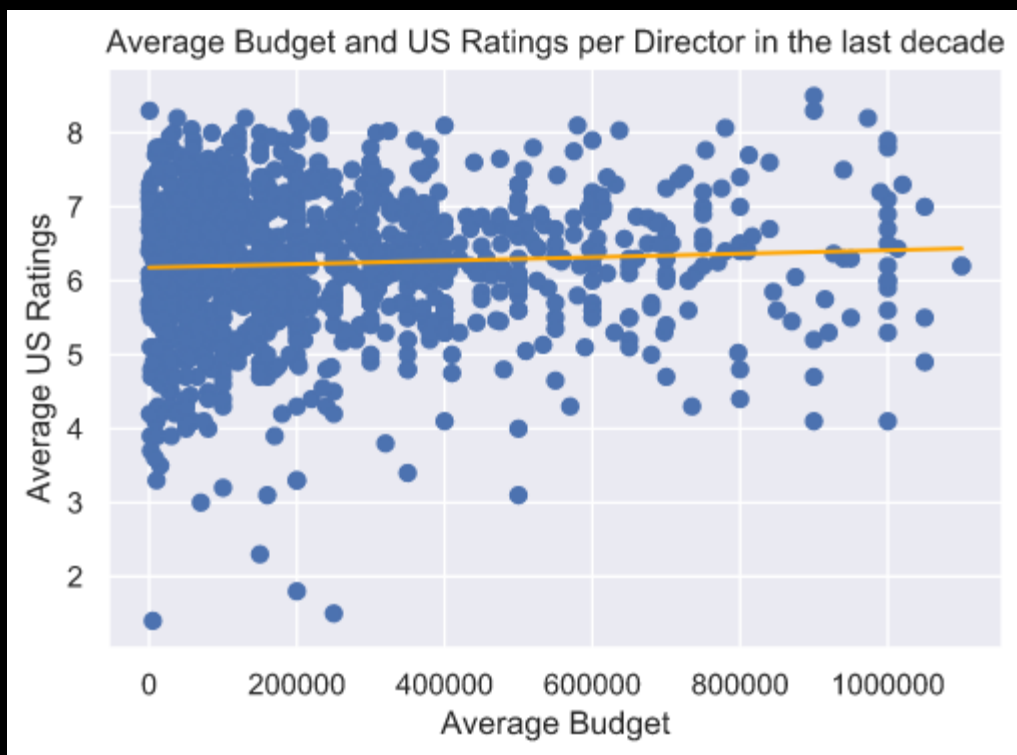
## Worldwide



The correlation between the average budget and the average revenue Worldwide in the last decade is 0.48

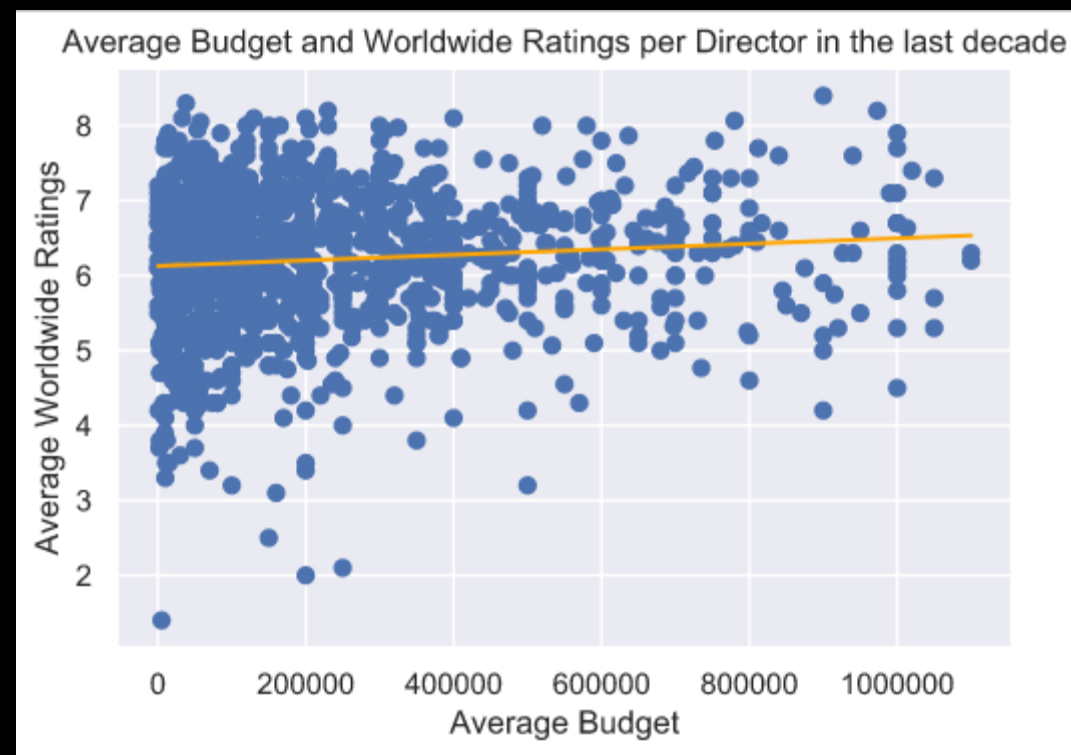
# Budget vs Ratings in the last decade

## US



The correlation between the average budget and the average ratings in US in the last decade is 0.06

## Worldwide



The correlation between the average budget and the average ratings Worldwide in the last decade is 0.1



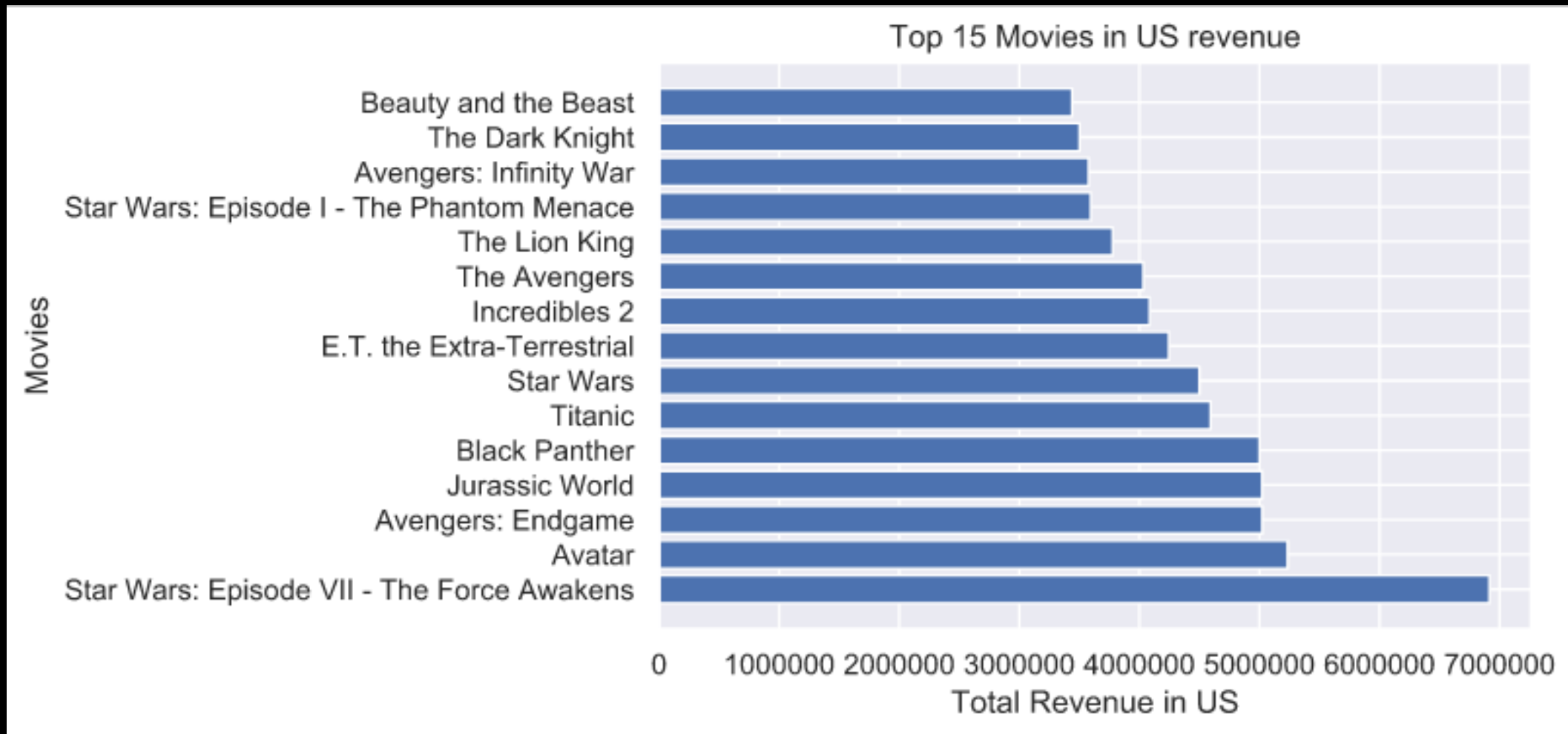
# Results

- There is no much of a difference.
- We still see a mild correlation between the revenue Worldwide and the budget, but again, doesn't seem that significant.

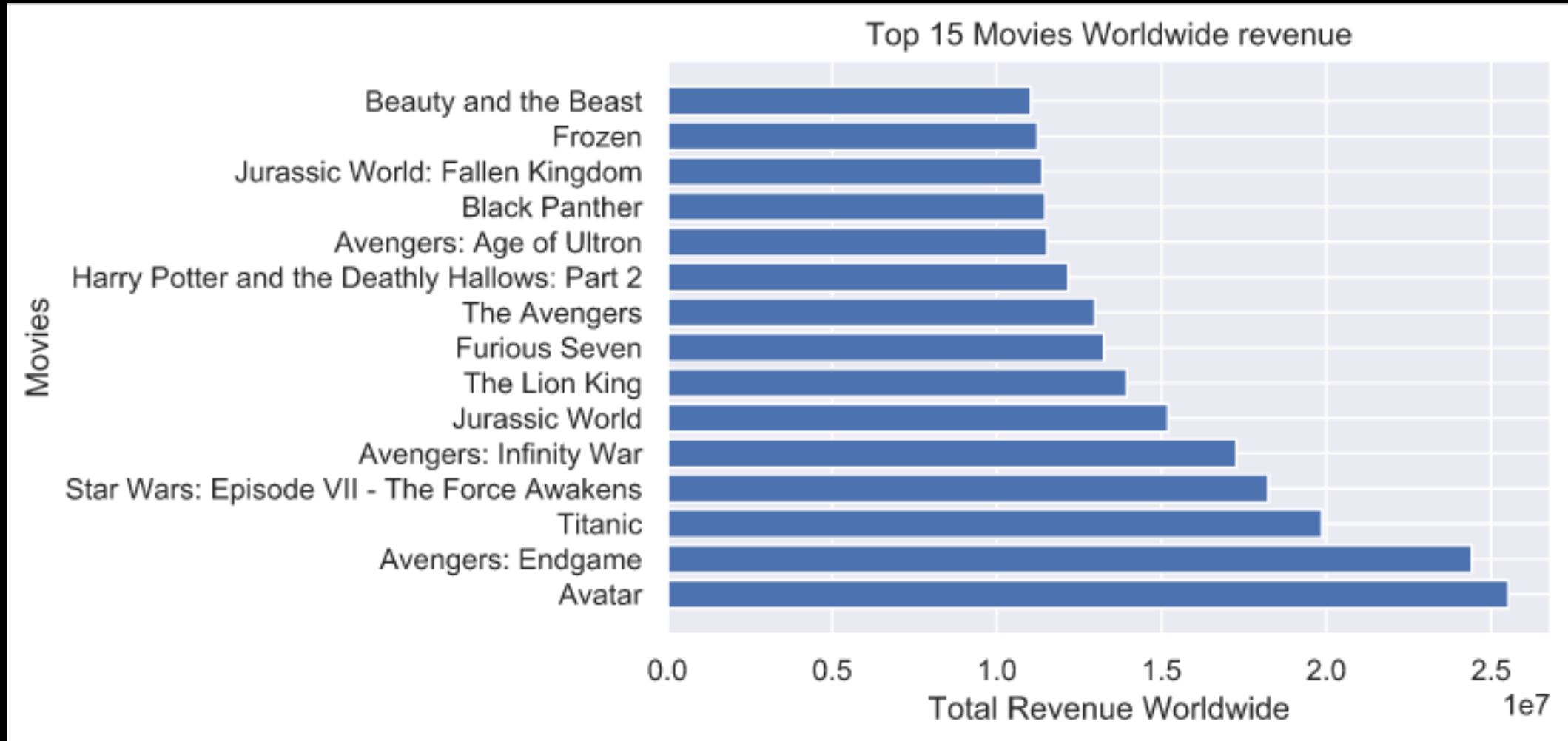
What if...?



# Top 15 movies with biggest revenue in US



# Top 15 movies with biggest revenue Worldwide



# Top movies summary

Title	Year	Director	US Revenue	WW Revenue	Top US	Top WW
<b>The Lion King</b>	2019	Jon Favreau	2,834,968	13,951,569	11	7
<b>Avengers: Endgame</b>	2019	Anthony Russo, Joe Russo	5,023,730	24,418,006	3	2
Incredibles 2	2018	Brad Bird	4,085,817	10,428,054	9	-
Jurassic World: Fallen Kingdom	2018	J.A. Bayona	2,477,198	11,384,679	-	13
<b>Avengers: Infinity War</b>	2018	Anthony Russo, Joe Russo	3,578,155	17,273,598	13	5
<b>Black Panther</b>	2018	Ryan Coogler	5,000,596	11,469,132	5	12
<b>Beauty and the Beast</b>	2017	Bill Condon	3,440,142	11,035,211	15	15
<b>Star Wars: Episode VII - The Force Awakens</b>	2015	J.J. Abrams	6,916,622	18,232,236	1	4
<b>Jurassic World</b>	2015	Colin Trevorrow	5,022,706	15,204,006	4	6
Avengers: Age of Ultron	2015	Joss Whedon	2,090,059	11,528,059	-	11
Furious Seven	2015	James Wan	1,630,070	13,250,477	-	8
Frozen	2013	Chris Buck, Jennifer Lee	2,507,380	11,242,190	-	14
<b>The Avengers</b>	2012	Joss Whedon	4,033,579	12,988,130	10	9
Harry Potter and the Deathly Hallows: Part 2	2011	David Yates	2,564,093	12,169,324	-	10
<b>Avatar</b>	2009	James Cameron	5,235,076	25,529,683	2	1
The Dark Knight	2008	Christopher Nolan	3,502,340	8,199,340	14	-
Star Wars: Episode I - The Phantom Menace	1999	George Lucas	3,595,447	9,120,827	12	-
<b>Titanic</b>	1997	James Cameron	4,593,639	19,874,639	6	3
The Lion King	1994	Roger Allers, Rob Minkoff	3,777,838	9,235,118		
E.T. the Extra-Terrestrial	1982	Steven Spielberg	4,246,106	7,824,106	8	-
Star Wars	1977	George Lucas	4,499,985	7,645,121	7	-



# Conclusion

- Overall, critics are slight tougher reviewers, but it depends on the movie. Critics and viewers like different types of movies.
- Men and non-US viewers are typically harsher critics.
- There is not relation between the director and the success of a movie
- There is a small relationship between the budget a director has and the worldwide revenue of a movie.

