So many sequels?

- [Superhero fatigue: Does Marvel still have audience's' attention with its 32nd film?](#)
- [Why Marvel Fatigue Is Finally Setting In](#)
- [Have we gone from Marvel fatigue to Marvel exhaustion?](#)
- Spiderman does well, but Spiderverse movies are made by Sony
- Are sequels economic or lazy?

Context and hypotheses

Bob Iger has declared that Disney will cut down on Marvel production and claiming that fans have felt fatigue from the massive MCU IP that has "diluted focus and attention," according to Iger himself. With data on all of the MCU movies up through 2022, we intend to see whether or not trends would suggest that the MCU has peaked in popularity and whether Iger's claims have validity.

The Process

- Kaggle, community platform for sharing datasets.
  - Unanalyzed CSV on Marvel movies utilized -- metrics on budget, box office, worldwide gross, audience/critic reviews, etc.
- [Our project repository](#)
- Created project1 environment, VSC Jupyter Notebooks utilizing pandas, matplotlib, scipy.stats, numpy
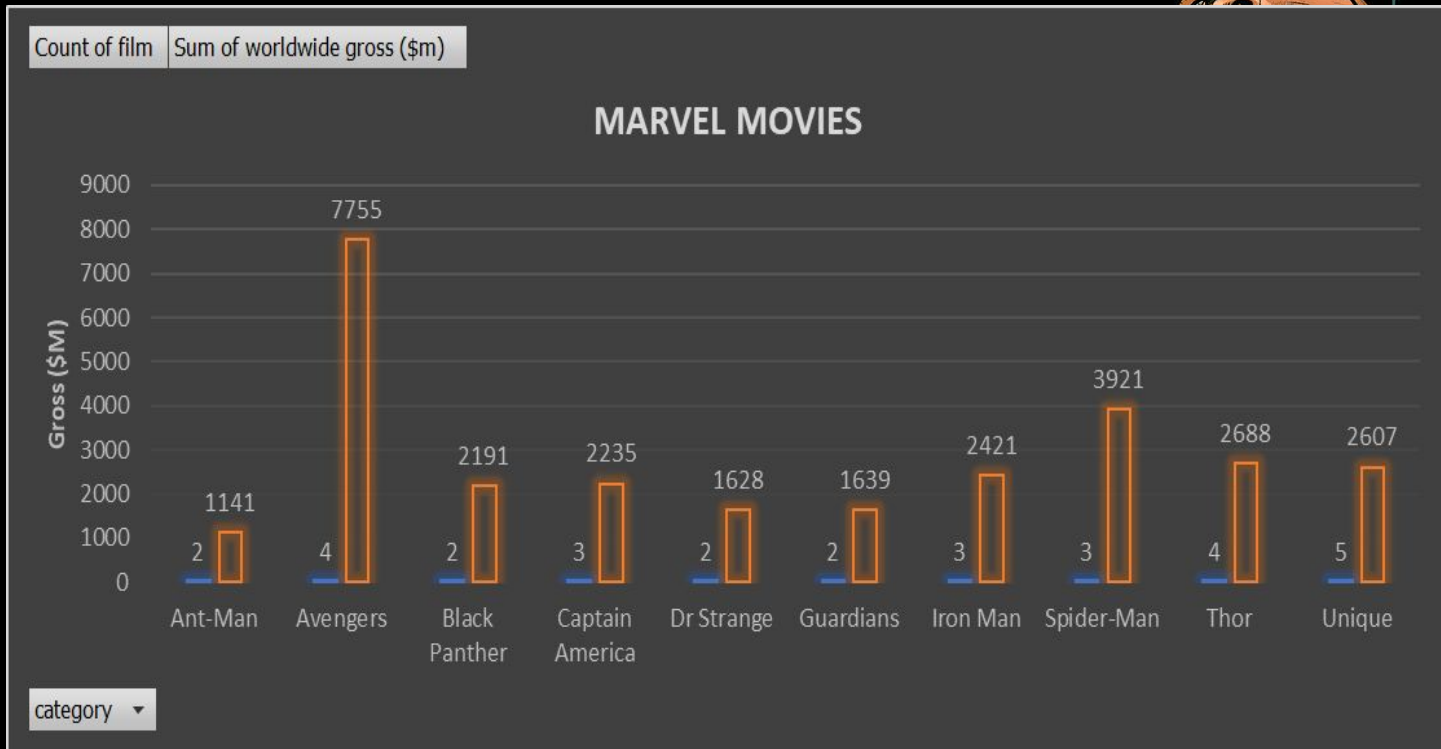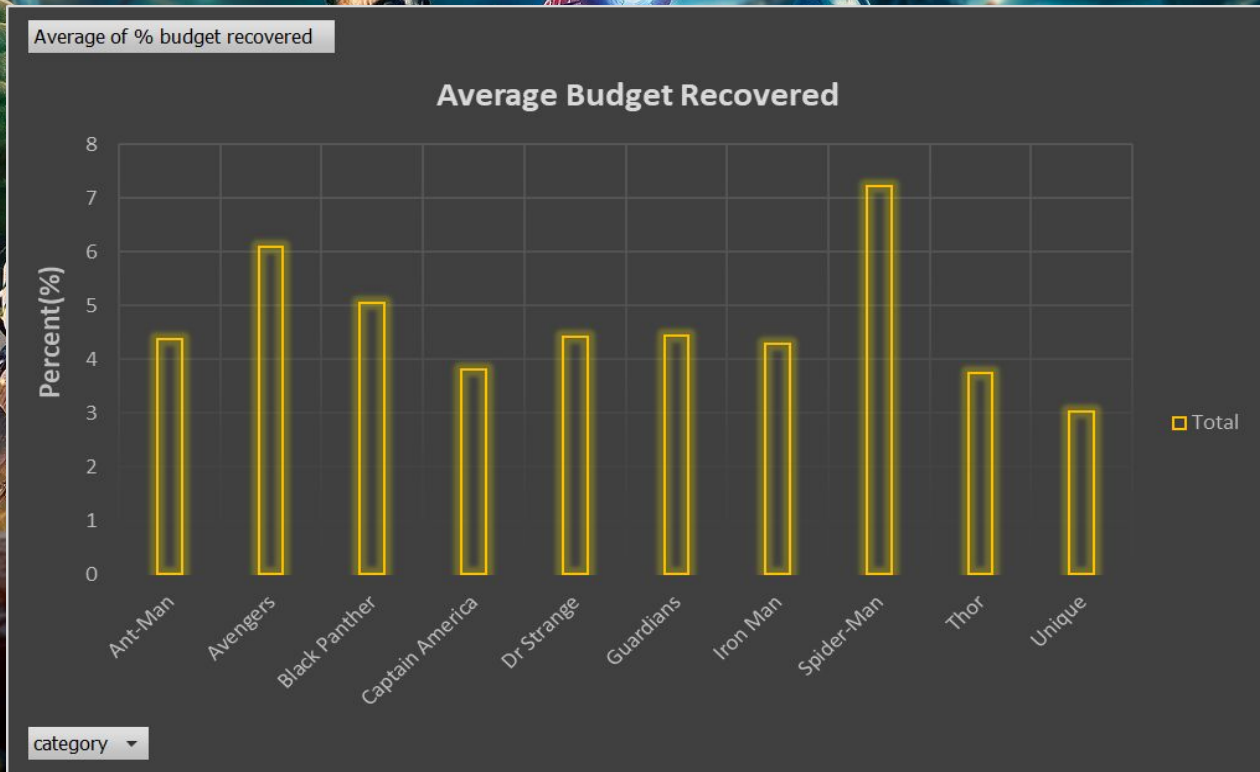

Questions to answer:

```
1. Which franchises are most profitable and which are least profitable? (Moises)
2. Bob Iger's Marvel fatigue --- see profitability over the years (has it waned?) (Chris)
3. Critic Scores vs. Audience Scores and their impact on Box Office numbers (Andrew)
4. Domestic vs. International (Joseph)

Not included in the data: Ant-Man 3, Guardians 3 (2023)
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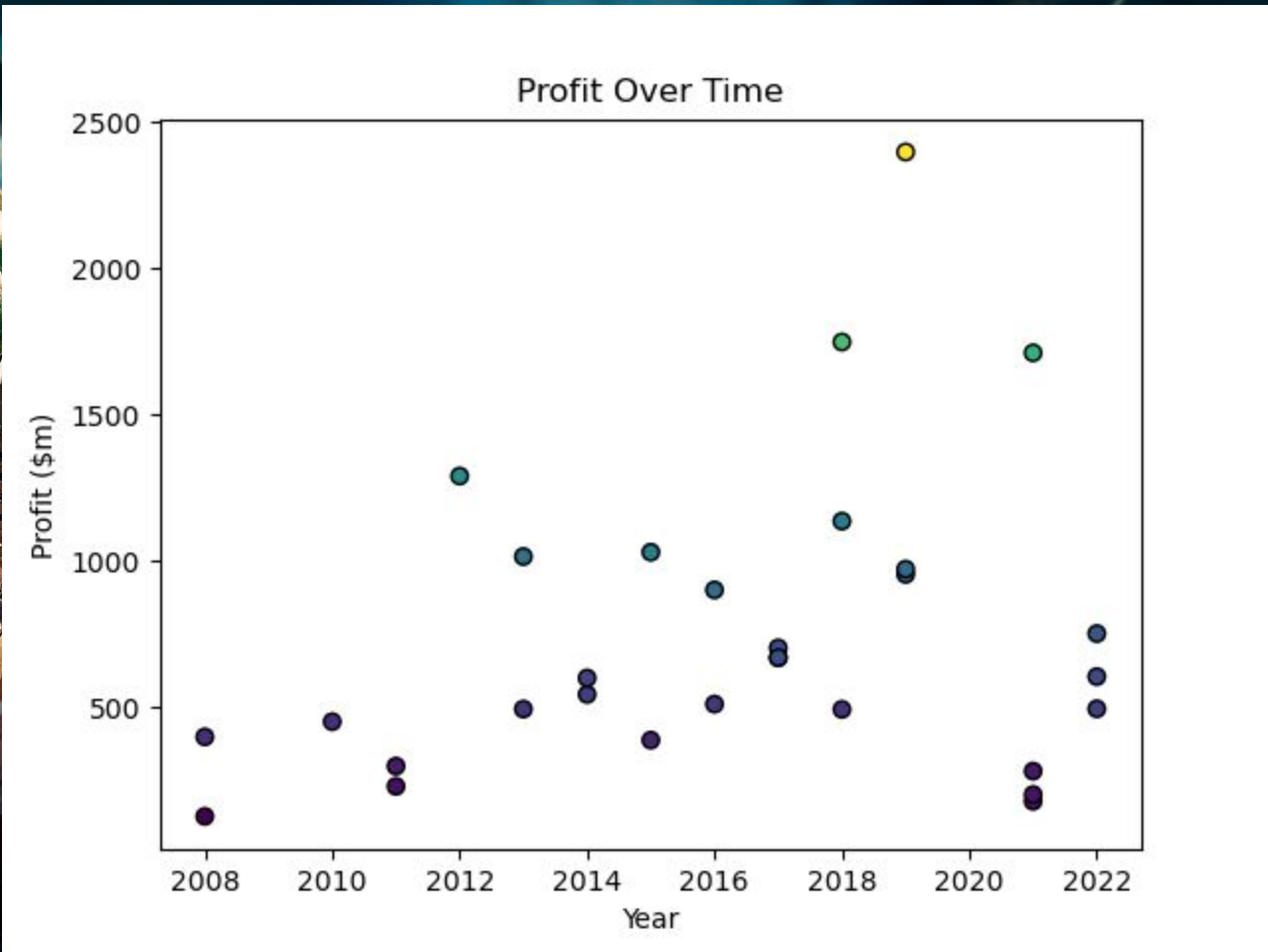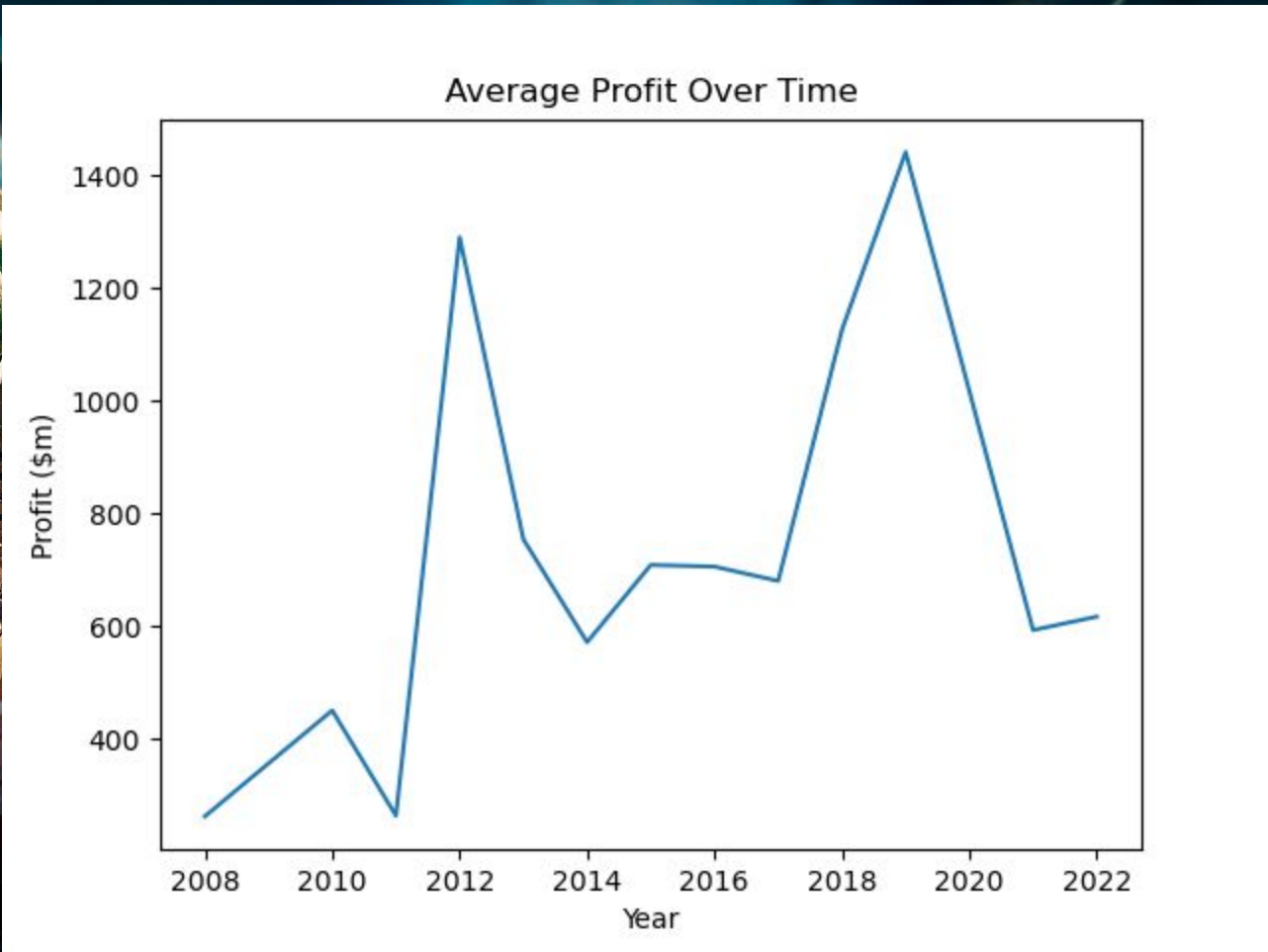
Which franchises are most profitable and which are least profitable?
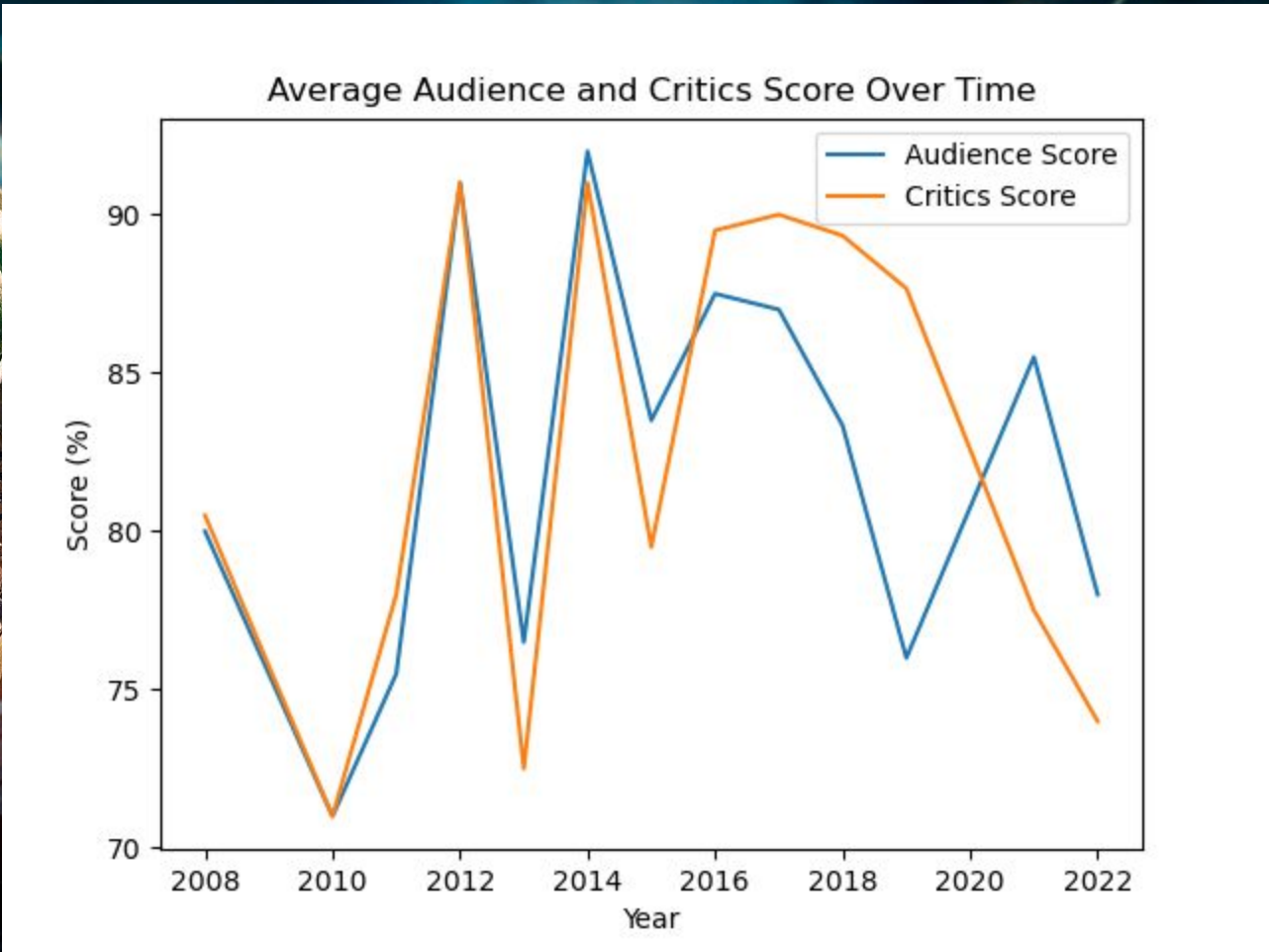
Which franchises are most profitable and which are least profitable?

Average of % budget recovered

Average Budget Recovered

Profit Over Time

Average Profit Over Time

Average Audience and Critics Score Over Time

Profits by Marvel Franchise

Andrew

Profits by Marvel Franchise

category	worldwide gross ($m)	critics % score	audience % score	domestic gross ($m)	international gross ($m)	opening weekend ($m)
Avengers	1938.75	86.500000	88.500000	654.500000	1283.750000	253.000000
Spider-Man	1307.00	91.666667	92.000000	512.666667	794.000000	156.666667
Black Panther	1095.50	90.000000	86.500000	576.500000	518.500000	191.500000
Guardians	819.50	88.500000	89.500000	361.000000	458.000000	120.000000
Dr Strange	814.00	81.500000	81.500000	321.500000	491.500000	136.000000
Iron Man	807.00	81.333333	80.000000	346.000000	460.000000	134.666667
Captain America	745.00	86.333333	85.333333	281.000000	463.333333	113.000000
Thor	672.00	75.000000	75.250000	261.250000	411.000000	104.000000
Ant-Man	570.50	85.000000	82.500000	198.000000	372.000000	66.400000
Unique	521.40	72.600000	72.000000	226.200000	294.400000	86.860000

The Avengers franchise has the highest average worldwide gross. Their unique category (stand-alone films) have the lowest average worldwide gross. Captain America, despite being the fan-favorite Avenger in poll-data, is low along with Thor and Ant-Man. This data does not include movies from 2023.

Reviews by Marvel Franchise

Andrew

Reviews by Marvel Franchise

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Spider-Man has the highest average critic score and their Unique category (Stand-alone films) again has the lowest in both critics and audience score averages. The Avengers franchise falls to 4th in this category.

In Summary (Andrew's findings)

Context and hypotheses

Bob Iger has declared that Disney will cut down on Marvel production and claiming that fans have felt fatigue from the massive MCU IP that has "diluted focus and attention," according to Iger himself. With data on all of the MCU movies up through 2022, we intend to see whether or not trends would suggest that the MCU has peaked in popularity and whether Iger's claims have validity.

Summary

1. Martin Scorsese said that Marvel movies aren't cinema. But critics and audiences didn't differ too much in their opinions on MCU movies.
2. The MCU Box office has definitely grown but, like with many of these graphs linearly represented, it is hard to tell whether or not Marvel has peaked.
3. Positive reviews from critics and audiences alike helped gross international revenues.
4. Positive reviews from critics and audiences alike potentially spurred more enthusiasm on opening weekend.
5. The Avengers and Spiderman have been Disney's most successful IPs.
6. For everyone complaining about all of the endless sequels, people aren't showing up for MCU original IPs.

My question: "Did critics' and audiences' reviews affect Box Office numbers?" Yes, it appears that they did.
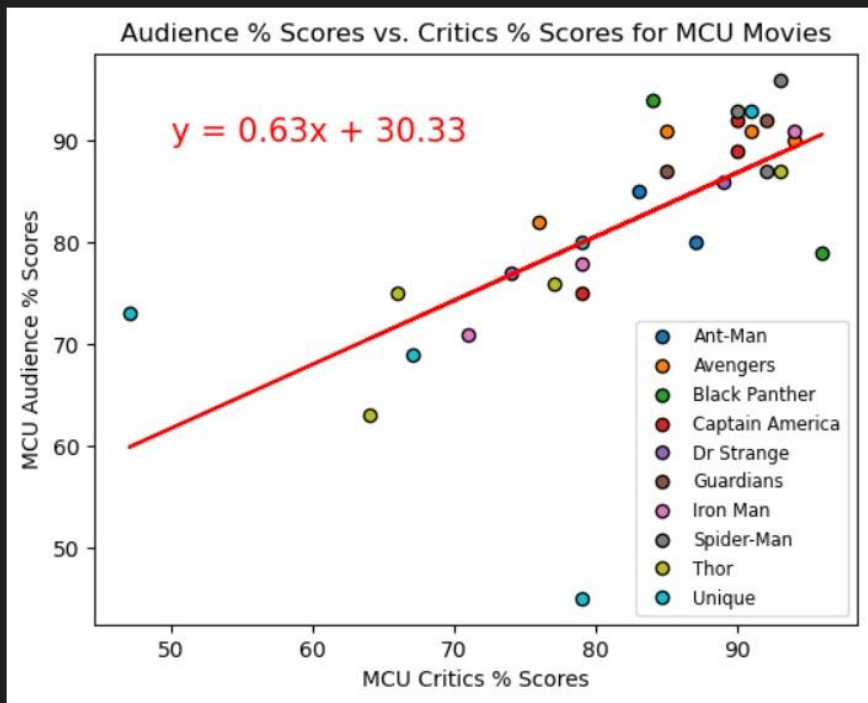
```
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4. Domestic vs. International (Joseph)

Not included in the data: Ant-Man 3, Guardians 3 (2023)
```

Audience vs. Critic Scores

Andrew

The r-value between audience reviews and critics reviews is 0.64.

Audience % Scores vs. Critics % Scores for MCU Movies

$y = 0.63x + 30.33$

Legend:
- Ant-Man
- Avengers
- Black Panther
- Captain America
- Dr Strange
- Guardians
- Iron Man
- Spider-Man
- Thor
- Unique

MCU Audience % Scores (y-axis)
MCU Critics % Scores (x-axis)

Audience scores versus critics scores are highly correlated but still tend to differ. The outlier on the bottom was Captain Marvel and the outlier on the left was Eternals.

Code Example from Andrew

```python
#Graph critics % score against audience % score
groups = reviews_df.groupby("category")
for name, group in groups:
    plt.plot(group["critics % score"], group["audience % score"], marker="o", linestyle="", label=name, markeredgecolor='black')
plt.legend(fontsize='small')
plt.xlabel("MCU Critics % Scores")
plt.ylabel("MCU Audience % Scores")
plt.title("Audience % Scores vs. Critics % Scores for MCU Movies")
(slope, intercept, rvalue, pvalue, stderr) = st.linregress(reviews_df["critics % score"], reviews_df["audience % score"])
correlation = st.pearsonr(reviews_df["critics % score"], reviews_df["audience % score"])
regress_values = reviews_df["critics % score"] * slope + intercept
line_eq = f"y = {str(round(slope, 2))}x + {str(round(intercept, 2))}"
plt.plot(reviews_df["critics % score"], regress_values, color="red")
plt.annotate(line_eq, (50,90), fontsize=15, color="red")
print(f"The r-value between audience reviews and critics reviews is {round(correlation[0], 2)}.")
plt.savefig("Outputs/Fig1.png")
```

MCU Opening Weekend Box Office over time

Andrew

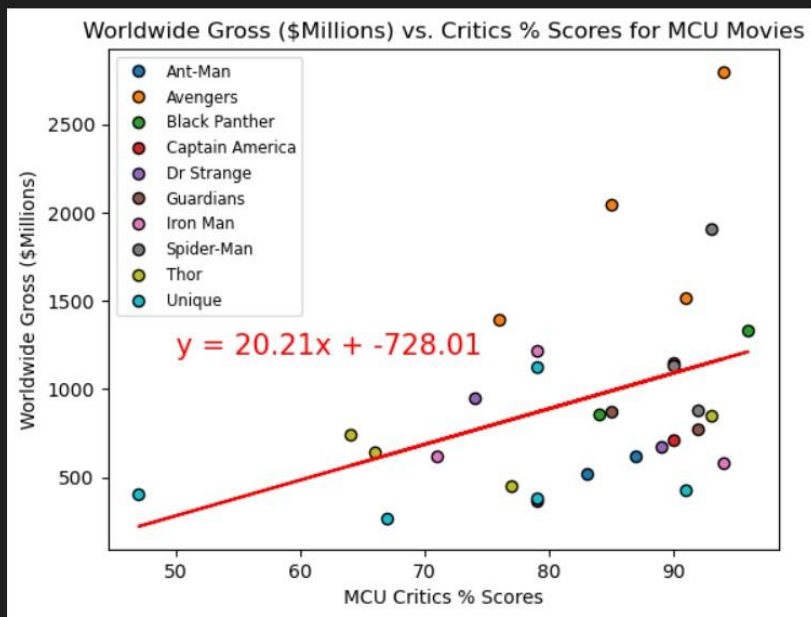The r-value between year and opening weekend box office is 0.32.
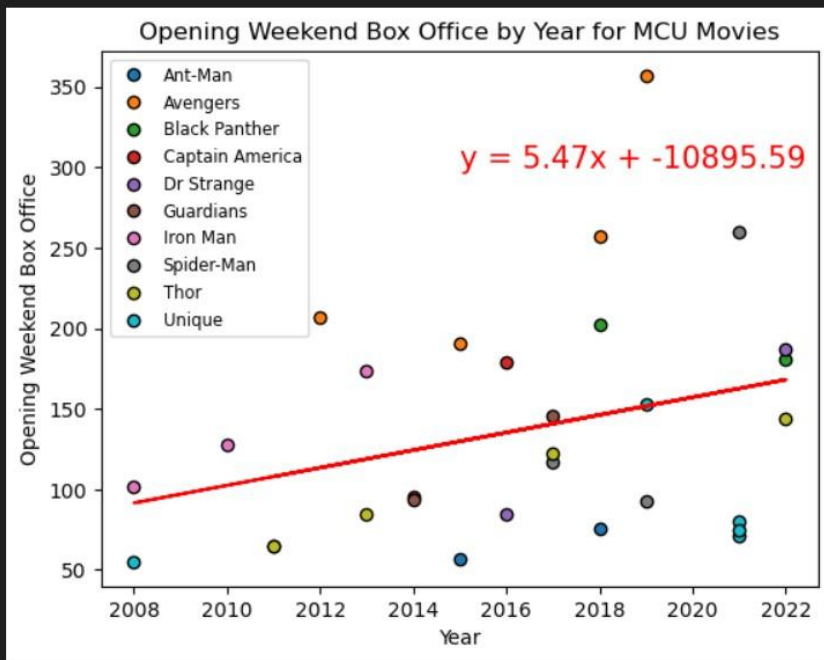
Opening Weekend's have gotten more profitable for Marvel as it built the MCU brand. But post Avengers: Endgame may suggest that a linear regression is not the best fit here.

Do Critics Scores affect Worldwide Gross?

Andrew

The r-value between worldwide gross (millions) and critics reviews is 0.4.

Worldwide Gross ($Millions) vs. Critics % Scores for MCU Movies

Legend: Ant-Man, Avengers, Black Panther, Captain America, Dr Strange, Guardians, Iron Man, Spider-Man, Thor, Unique

$y = 20.21x + -728.01$

Critics scores have had effects on the worldwide revenue for Marvel movies. Or maybe worldwide revenues pressured critics into giving better ratings? Perhaps both of these are affected by a counfounding variable. The relationship may not be so obvious.

Do Audience Scores affect Worldwide Gross?

Andrew

The r-value between worldwide gross (millions) and audience reviews is 0.29.

Worldwide Gross ($millions) vs. Audience % Scores for MCU Movies

$y = 14.8x + -276.17$
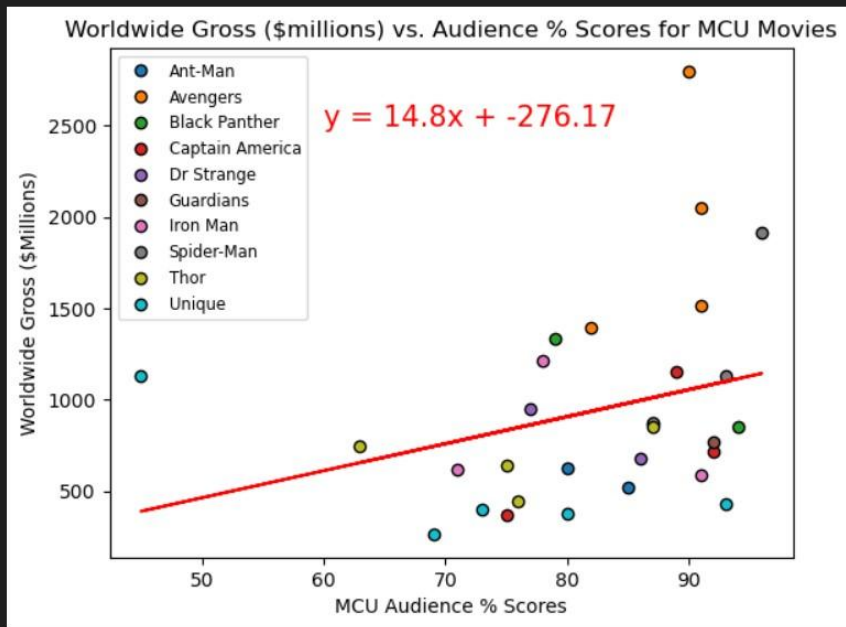
The same logic applies here. At first glance, the relationship seems to suggest that audience reviews and spreading the word really does excite or dampen a movie's profits. But a potential alternative would be that as more people see the movie and rate it, the scores tend to steady-state at a higher review score.

Do Critics Scores affect Opening Weekend?

Andrew

The r-value between opening weekend box office and critics reviews is 0.31.

Opening Weekend ($Millions) vs. Critics % Scores for MCU Movies
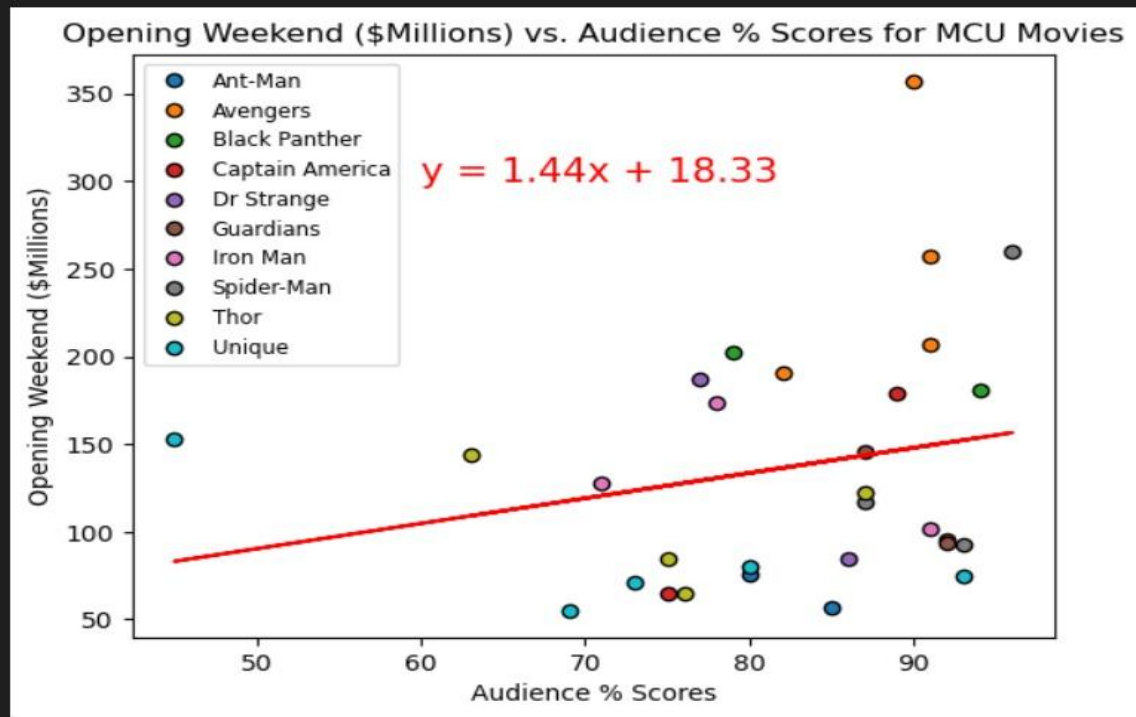
$y = 2.0x + -28.06$
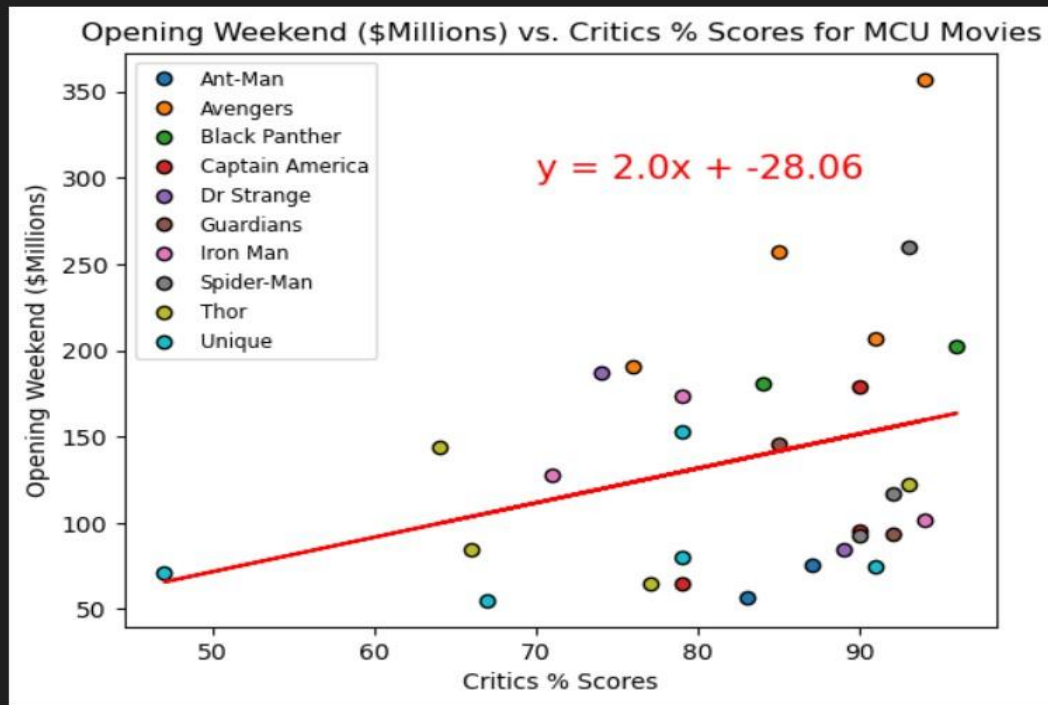
As review embargos lift, is opening weekend a game of momentum and turnout? Positive critics scores appear to have increased box office traffic.

Do Audience Scores affect Opening Weekend?

Andrew

The r-value between opening weekend box office and audience reviews is 0.22.

Opening Weekend ($Millions) vs. Audience % Scores for MCU Movies

Legend:
- Ant-Man
- Avengers
- Black Panther
- Captain America
- Dr Strange
- Guardians
- Iron Man
- Spider-Man
- Thor
- Unique

$y = 1.44x + 18.33$

Higher opening weekend revenues and audience ratings also correlated with one another positively.

Primary Question

What is the distribution of gross earnings in the MCU by domestic vs international viewership?
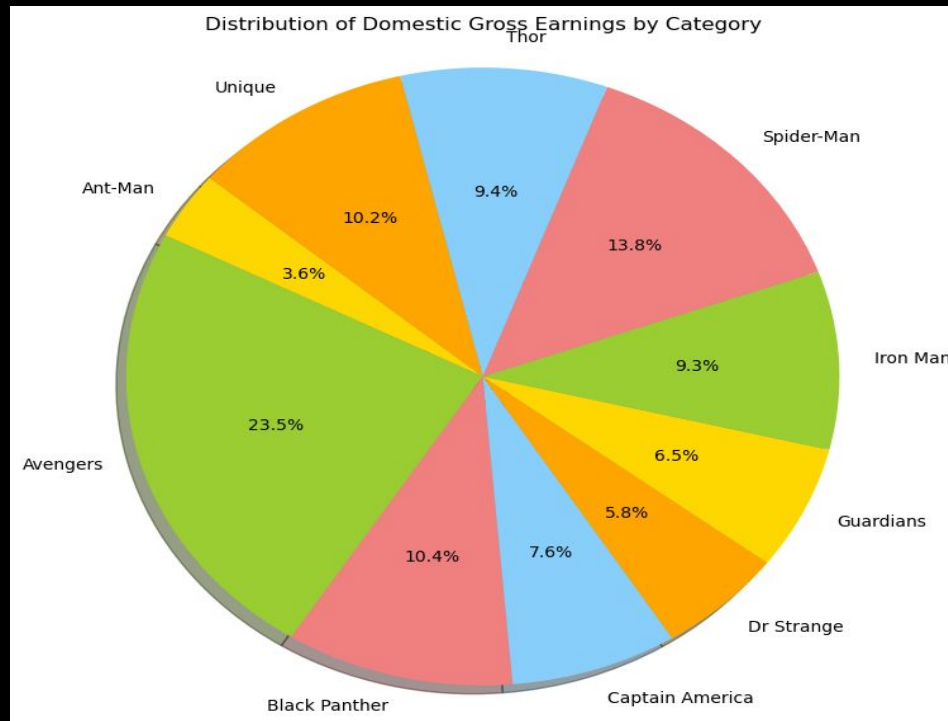
Joseph D Yiga

Joseph Y - Code Example

```python
#   Data Visualization – Pie Chart
# Calculate total domestic gross earnings for each category
grouped_domestic_earnings = grouped_data['domestic gross ($m)'].sum()

# Create a pie chart
labels = grouped_domestic_earnings.index
sizes = grouped_domestic_earnings.values
colors = ['gold', 'yellowgreen', 'lightcoral', 'lightskyblue', 'orange']


plt.figure(figsize=(8, 8))
plt.pie(sizes, labels=labels, colors=colors,
        autopct='%1.1f%%', shadow=True, startangle=140)
plt.title('Distribution of Domestic Gross Earnings by Category')
plt.axis('equal')  # Equal aspect ratio ensures that pie is drawn as a circle.
plt.show()
```
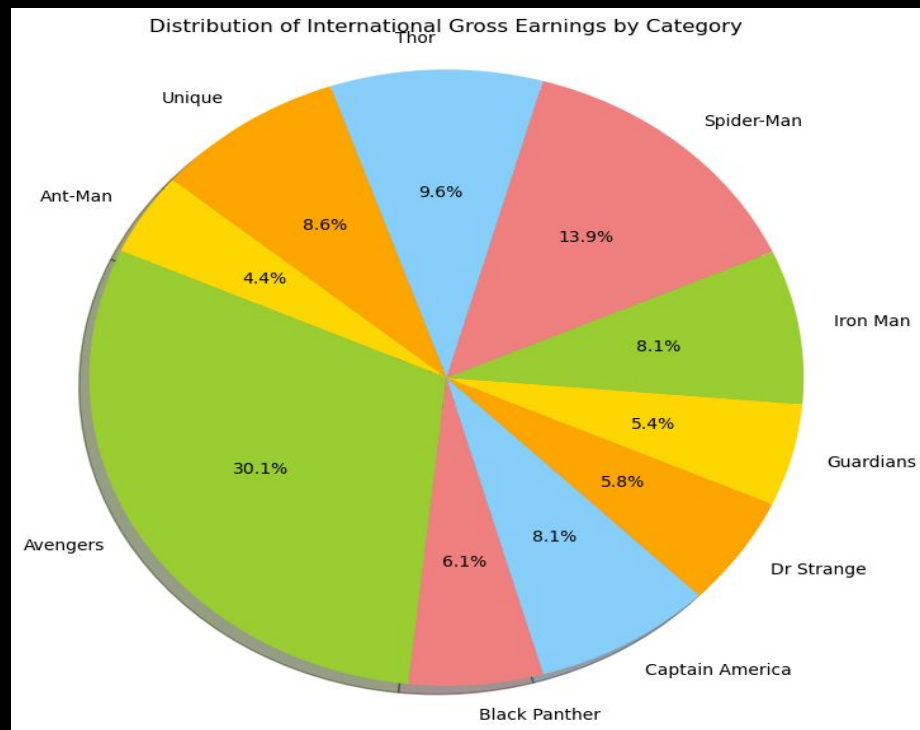
[6]   ✓   0.1s   Python
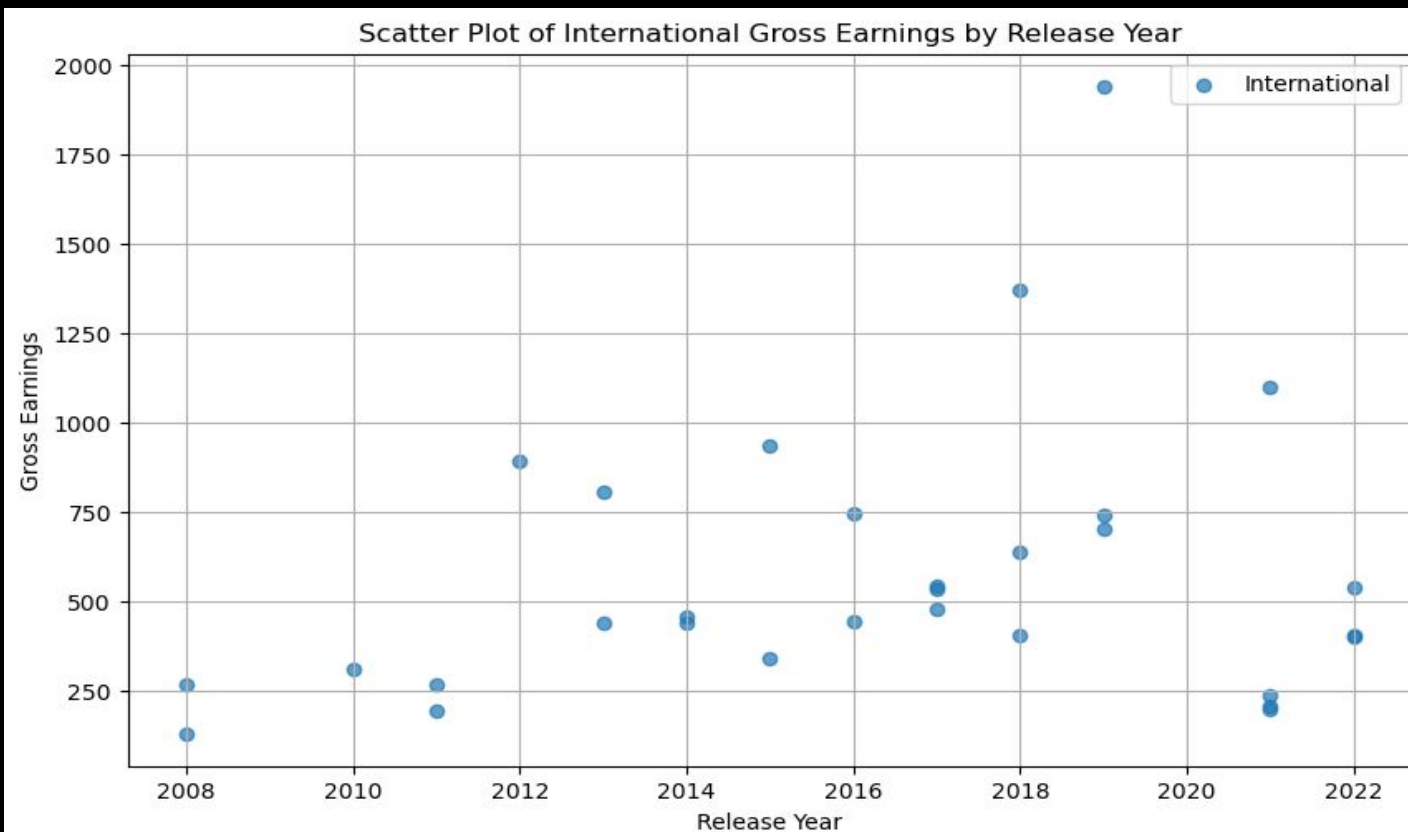
Domestic Gross Earnings by category

Domestic

Distribution of Domestic Gross Earnings by Category

International Gross Earnings by Category

International

Distribution of International Gross Earnings by Category

Scatter Plot of International Gross Earnings by Release Year