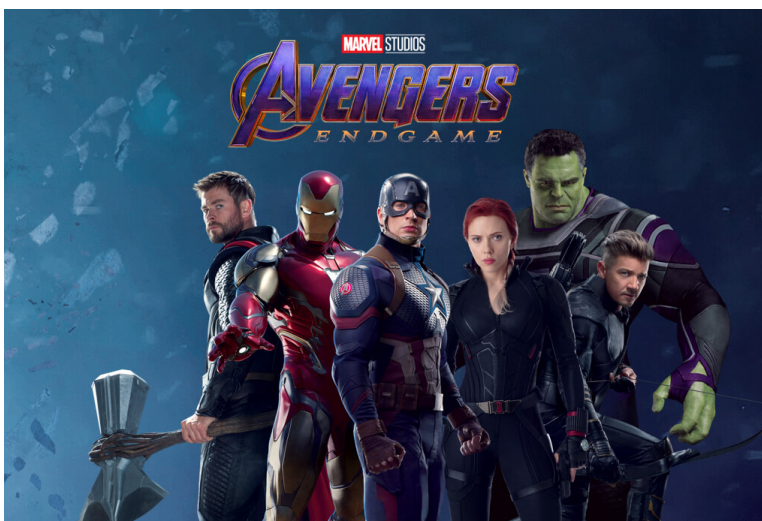


Opening Weekend: Avengers: Endgame



Avengers: Endgame opened in theatres in the US on April 26, 2019

This past weekend, *Avengers: Endgame* had a tremendous opening weekend with earning of 350 million dollars in the US.

In opening weekends, a movie's opening gross income is often quoted as a way of measuring the movie's eventual success. Can you predict a movie's total gross income from its opening weekend gross income?

Here's data on 14 movies that you might have seen (15 if you've already seen the new *Avengers*). We've included the gross amount that they earned on their opening weekend (U.S.) and the gross amount that they have earned (U.S.) in total at theatres. We've also included the new *Avengers* movie but did not give its long-term gross income.

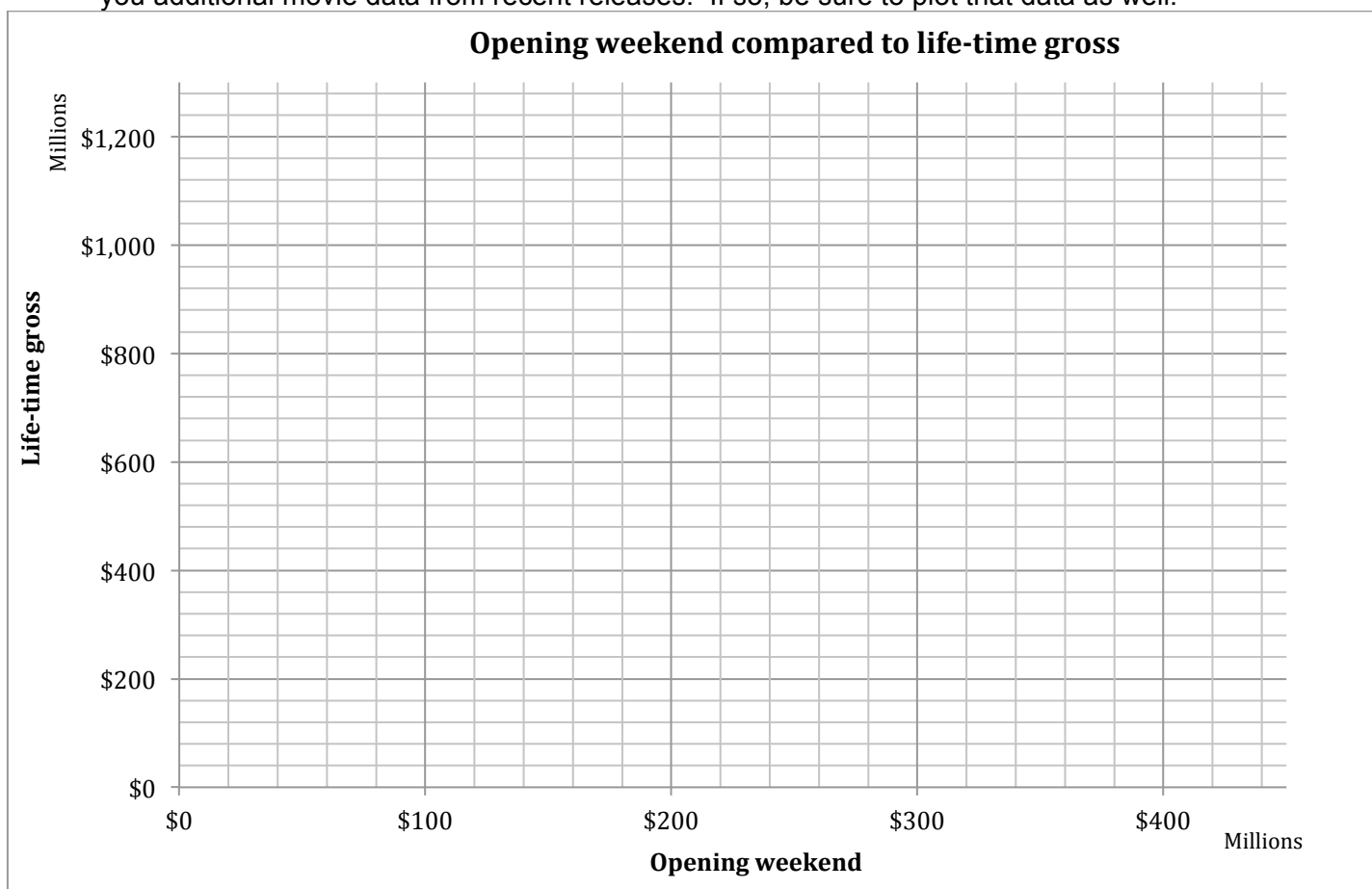
Title	Opening	Total Gross	Release
Avatar	\$77,025,481	\$760,507,625	12/18/09
Frozen	\$67,391,326	\$400,738,009	11/27/13
The Martian	\$54,308,575	\$228,433,663	10/2/15
The Jungle Book (2016)	\$103,261,464	\$364,001,123	4/15/16
Star Trek Beyond	\$59,253,211	\$158,848,340	7/22/16
Fantastic Beasts and Where To Find Them	\$74,403,387	\$234,037,575	11/18/16
Pirates of the Caribbean: Dead Men Tell No Tales	\$62,983,253	\$172,558,876	5/26/17
Wonder Woman	\$103,251,471	\$412,563,408	6/2/17
Spider Man: Homecoming	\$117,027,503	\$334,201,140	7/7/17
Star Wars: The Last Jedi	\$220,009,584	\$620,181,382	12/15/17
Black Panther	\$202,003,951	\$700,059,566	2/16/18
Coco	\$50,802,605	\$209,726,015	2/19/18
Avengers: Infinity Wars	\$257,698,183	\$678,815,482	4/27/18
How to Train your dragon	\$55,022,245	\$159,242,320	2/2/19
Avengers: Endgame	\$350,000,000		4/26/19

We wonder if you can predict what this movies total gross income will be by studying the opening weekend data. Maybe there is a pattern between the opening weekend data and the final gross total income of the movie. Let's see if that is true.

[We've left a few blank lines in the chart above for you to add your favorite movies or other recent movies. You can find the opening weekend and final gross data at <http://boxofficemojo.com/>.

1. On the next page we've created a graph for you to use to create a scatter plot. The horizontal axis will represent the opening weekend income of each film. The vertical axis will be the final gross

income of the movie. Plot the data from above on the next page's chart. Your teacher may also give you additional movie data from recent releases. If so, be sure to plot that data as well.



2. Is the relationship between Opening weekend income and the film's final income a linear association or something else? Describe the association between the two variables.
3. Can you predict what *Avengers: Endgame* will finally earn in U.S. theaters? What about any additional movies that you plotted?
4. Based on the data, how much would you expect movies to make in gross that had opening weekends of \$80 million, \$100 million, \$200 million and \$250 million? How did you determine your estimates?
5. Draw a line of best fit that models the data. How do you decide where to draw your line?

6. Write the linear equation for your line of best fit. This equation should give a reasonable (yet rough) prediction of the amount of money a movie will gross for any opening weekend total. Please show or explain how you came to your rule.

7. If future *Avenger* films beat the opening weekend numbers and make \$350,000,000 or \$400,000,000 in the U.S., how much might they make in total at theaters?

8. For a film to make a billion dollars in U.S. theaters how much would it need to make during its opening weekend? Explain and justify your reasoning.

9. Once the data is available (probably several weeks after opening) go back check and the actual data for *Avengers*. You can get this data from the Internet or your teacher may provide it for you. Describe how accurate your predictions were. Did the data follow the association or was this movie an outlier?

Sources: <http://boxofficemojo.com/>
<http://www.the-numbers.com/>