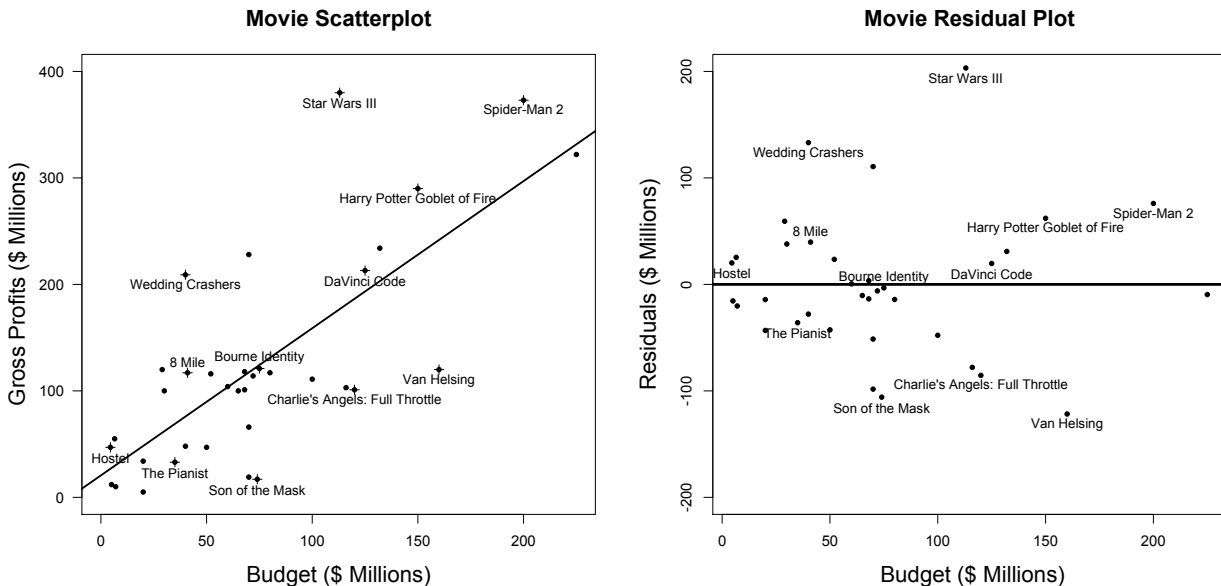# STAT 101 Regression Worksheet   Name:_____

The movie industry is a big business. But how does the amount of money spent producing a money affect it's profits. Does spending massive amount of money guarantee a successful movie? Or do low budget movies outperform large budget movies. A regression model provides a metric which we can use to make these types of comparisons.

Movie Scatterplot

Movie Residual Plot

The relationship between the Movie Budget and the Gross Profits can be modeled using a linear regression. Below is some JMP output regarding the model.

Linear Fit

Predicted Gross = 20.62 + 1.38*Budget

Summary of Fit

RSquare	0.554
RSquare Adj	0.541
Root Mean Square Error	67.79
Mean of Response	123
Observations (or Sum Wgts)	35

1. Describe the Scatterplot. Be sure to mention the form, direction, strength and outliers.

2. State the formula for the regression line.

3. What percent of variation in the Gross profits is accounted by the linear regression using the Movie Budget? *(hint: This is the interpretation for R^2)*

4. Complete the interpretation of the slope b_1.

For every _____ increase in a movie's budget, the gross profit

_____ by _____ Million dollars, _____.

5. Complete the interpretation of the intercept b_0.

A movie with a Budget of _____ has an expected gross profit of

_____ Million Dollars.

6. Does the residual plot indicate that a linear regression is an appropriate model in this situation?

☐ Yes. There is not a pattern in the residual plot and hence a linear regression is appropriate.
☐ No. There is a curved patter in the residual plot and thus a linear regression is not appropriate.
☐ No. There is too much data to determine if the model is accurate.

7. What is the range of movie budgets for which we should feel safe making predictions?
☐ $0 - $225 million
☐ $100 - $200 million
☐ $100 - $1.0 Billion
☐ Predictions for any budget amount are reasonable. Just plug the numbers in.

8. "Star Wars III" would be considered a movie with... (check all that apply)
☐ A Large Residual
☐ High Leverage
☐ An Influential Point

9. Which of the labelled movies did you enjoy the most?