Lab 4F: Some Models Have Curves
Response Sheet

Directions: Record your responses to the lab questions in the spaces provided.

Problems with lines

• Describe, in words, how the line fits the data. Are there any values for `critics_rating` that would make obviously poor predictions?

• Compute the MSE of the model for the `testing` data and write it down for later.

Making bend-y models

• What is the role of the number 2 in the `poly()` function?

• Write down the model equation in the form:

$$y = a + bx + cx^2$$

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Comparing lines and curves

• Compare how the *line of best fit* and the *quadratic* model fit the data. Use the difference in each model's testing MSE to describe why one model fits better than the other.

On your own

• Create a model that predicts `audience_rating` using a 3 degree polynomial (called a cubic model) for the `critics_rating` using the training data.

• By using a plot, describe why you think a 2 or 3 degree polynomial will make better predictions for the testing data.

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- Compute the MSE for the model with a 3 degree polynomial and use the MSE to justify whether the 2 or 3 degree polynomial fits the `testing` data better.

- Using the linear model from above which has the smallest MSE, include an additional numerical variable to the model and recompute the MSE. Does modeling the variable you chose as a quadratic polynomial improve the MSE further?