

Name: _____

Teacher: _____

M112: Modeling with Data: Two-Variable Measurement Data

Pre-Badge Task

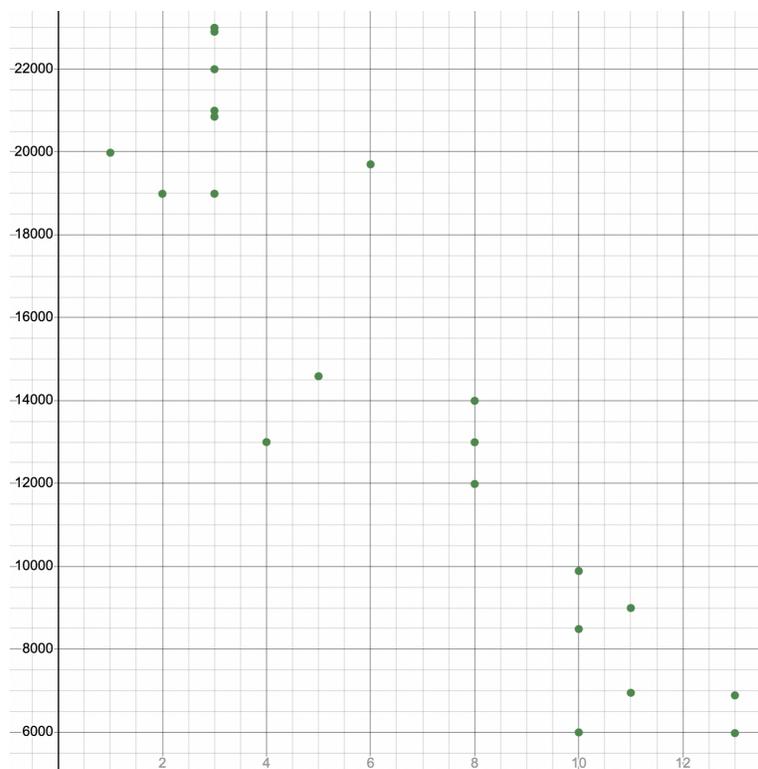
New Badge Alert!

This task will provide a preview of what we will be learning during the M112 - Modeling with Data: Two-Variable Measurement Data Badge. You already know so much math, so use this task to share any understanding that you have before we start our learning. You will have a chance to do the same task at the end of the badge to see how your thinking has evolved.

The Task Illustrative Mathematics, (2016)

Jane wants to sell her Subaru Forester, but doesn't know what the listing price should be. She checks on Facebook Marketplace, finds 22 Subarus listed, and collects data on these cars.

QUESTION 1 Some of the data Jane collected are shown on the graph below. Draw a line that best fits this data. Describe your choice of placement for this line.



QUESTION 2 Referring to the graph from Question 1, what could the variables represent about the Subarus that Jane found? Assume that the x-axis represents the independent variable and the y-axis represents the dependent variable.

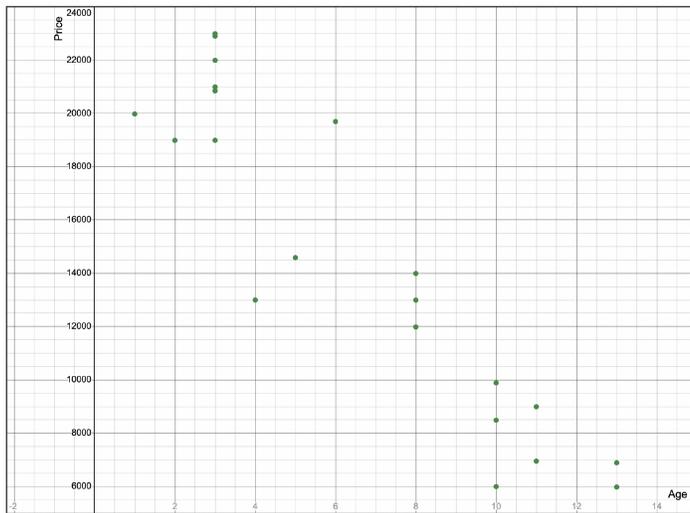


QUESTION 3 In the graph from Question 1, notice that when the independent variable is 10 there are three dependent variable values. Based on your answer from question 2, what could this mean in context? Does this answer make sense? Why or why not?

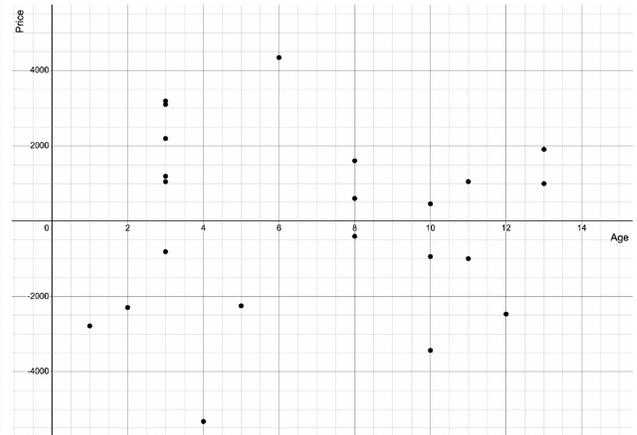


The data Jane collected include age (in years), mileage (in miles), and listed price (in dollars) for the 22 Subaru. Refer to the graphs below for Questions 4-6.

Listed Price (in dollars) vs. Age (in years)

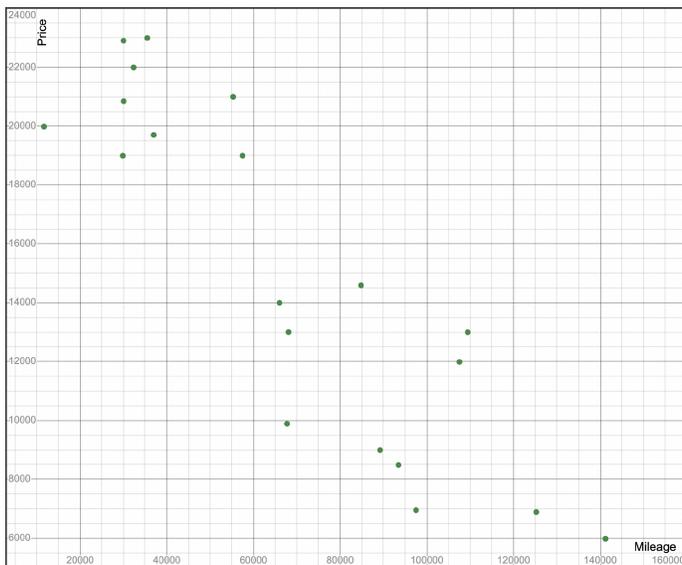


Residual Plot

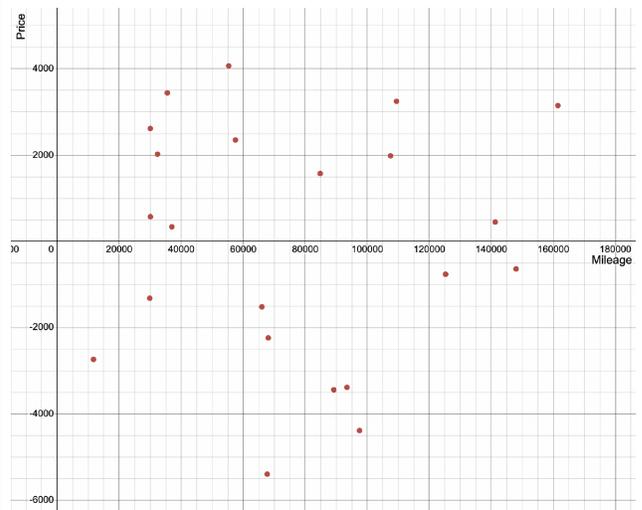


Least Squares Regression Line: $y = -1482.062x + 24247.560$
 Correlation Coefficient: $r = -0.9251$

Listed Price (in dollars) vs. Mileage (in miles)



Residual Plot



Least Squares Regression Line: $y = -0.133x + 24265.529$
 Correlation Coefficient: $r = -0.8995$

QUESTION 4 Which of the linear models provided (Listed Price vs. Age or Listed Price vs. Mileage) better predicts the listed price? Justify your reasoning.



QUESTION 5 If Jane's car is 9 years old with 95,000 miles on it, what listing price would you suggest? Explain how you arrived at this price.



QUESTION 6 Jane's friend Shelbi has a Subaru Forester that is 24 years old with 200,000 miles on it. Would it be appropriate to use either of the models to predict a listing price for Shelbi's car? Why or why not?

