

Practice Assignment: Coefficient of Determination

Questions 1–5: These questions reference the “House prices in FL” dataset, which can be accessed in the *DCMP Linear Regression* tool at https://lumen-learning.shinyapps.io/linear_regression/. We recommend opening this dataset using the *Linear Regression* tool to answer the following questions.

The scatterplot below visualizes the price and property taxes for 100 homes in Florida. The graphic can be reproduced in the tool by selecting price as the x variable and selecting taxes as the y variable.



- 1) Using technology, fit a linear regression model to these data. Draw a sketch of the line representing the model on the graph shown above.
- 2) Describe the relationship, in context.
- 3) Using technology, find the R^2 value. Then interpret this value, in context.
- 4) Now, let's hone in on two data values.

Part A: Circle two homes on the previous graph. The first should be the home priced between \$100–\$150 thousand with almost \$4,000 in taxes. Label this point “A.” The second should be the home priced over \$250 thousand with less than \$3,000 in taxes. Label this point “B.”

Part B: If we removed Home A from this dataset, would the R^2 value increase or decrease? Explain.

- 5) Florida has no state income tax, so the state depends on property taxes for a relatively large share of its revenue. Various factors, such as different tax rates by county and by school district, create the variation in tax amounts that you see in the graph. Hence, it's possible that a home valued at \$260,000 (Home B) could pay less in taxes than a home valued at \$118,300 (Home A).

Part A: If Florida were to impose a flat rate property tax (every household pays the exact same percentage of their home value in property taxes), what would the scatterplot look like? What would the R^2 value be?

Part B: Which would be more "fair:" the variable property tax rates visualized in the previous image or flat rate property taxes? Explain.