

Classwork Day 21: Linear regression

Group members:

Go to the website <http://setosa.io/ev/ordinary-least-squares-regression/> (link on course webpage).

- 1) In the first graph, the regression line is $5.00 + 0.81 * \text{hand size} = \text{height}$
Move the points so that they do not have a linear relationship (for example, maybe they curve), but still have a similar regression line.

Draw a rough picture of your graph below.

- 2) In the second graph, you can move the dials to change the regression line. A visualization of the squares of the residuals is shown on the right. What regression line minimizes the sum of the squares of the residuals?

3) The third graph adds a second x variable, and the regression line becomes a plane in 3D space. The article notes that regression in higher dimensions can be counter-intuitive. Move the data points around. What counter-intuitive behavior do you notice?

4) In the fourth graph, you can adjust the regression equation to try to minimize the sum of the squares of the residuals. What regression equation minimizes this sum?