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Stastistical power is a probability of small p-value when there is a real effect. Statistical power will not be asked.

Bigger/larger effects are easier to detect, so their statistical power is more. Bigger slope is more statistical power. Smaller sigma better. More data better.

What is least squares?

Find the values of the parameters that minimize the sum of the squared residuals. Residual is the difference between the observed response value and predicted response values.

Predict function

interval='prediction' is individual interval='confidence' is mean

How many different values of X are represented in this output? The answer is 4 as there are 4 rows.

In a simple regression, a line goes through the line $(\overline{x}, \overline{y})$. The prediction interval gets wider the further we get from $\overline{x}$. The prediction interval is the smallest one. In the question d, we just look at `upr - lwr`.

Regression degrees of freedom is $p - 1$ where p is the number of all predictor variables including the intercept. Total degrees of freedom is n - 1 which is the number of data samples minus one. Total sum of squares is regression sum of squares plus the error sum of squares.

R squared is regression sum of squares over the total sum of squares.