

MATH 134A Review: Least-squares regression

1. You have two points on a scatterplot. They are $(0, 0)$ and $(1, 0)$. You decide to plot a third point at $(2, t)$, where t is a variable. What is the value of t so that the slope of the least-squares regression line is 1.

Solution:

$$1 = b = \frac{(0 \cdot 0 - 0 \cdot \frac{t}{3}) + (1 \cdot 0 - 1 \cdot \frac{t}{3}) + (2 \cdot t - 2 \cdot \frac{t}{3})}{(0^2 - 0 \cdot 1) + (1^2 - 1 \cdot 1) + (2^2 - 2 \cdot 1)} = \frac{t}{2}$$
$$t = 2.$$