

y -on- x and x -on- y regressions

The Coué method • 2 Dec 2024

OLS regression

The OLS (ordinary least square) regression is described in [Simple linear regression model](#). We'll call this regression the y -on- x regression since we are using a value for x to predict a value for y .

Issues with y -on- x regression

- The regression-to-the-mean phenomenon means that the equation of the y -on- x regression is a biased estimate of the true functional relationship between x and y . Specifically, the absolute value of the slope of the y -on- x regression is smaller than the absolute value of the slope of the true relationship between x and y .
- The y -on- x regression is not symmetric. Specifically, if you solve x in terms of y in the y -on- x regression, you do not end up with the x -on- y regression.
- If you plot the y -on- x and x -on- y regressions in the same plane, both regression lines go through the data centroid (\bar{x}, \bar{y}) , but the slope of the x -on- y regression line is greater than or equal to the slope of the y -on- x regression line.

Reference

Simple linear regression model, <https://functor.network/user/1751/entry/653>