Meaning of Intercept in Linear Regression

Notes

- 1. The author accepts no responsibility for the topicality, correctness, completeness, or quality of the information provided.

- 2. This pdf is part of a YouTube tutorial: https://youtu.be/nYqaQHSU1b8

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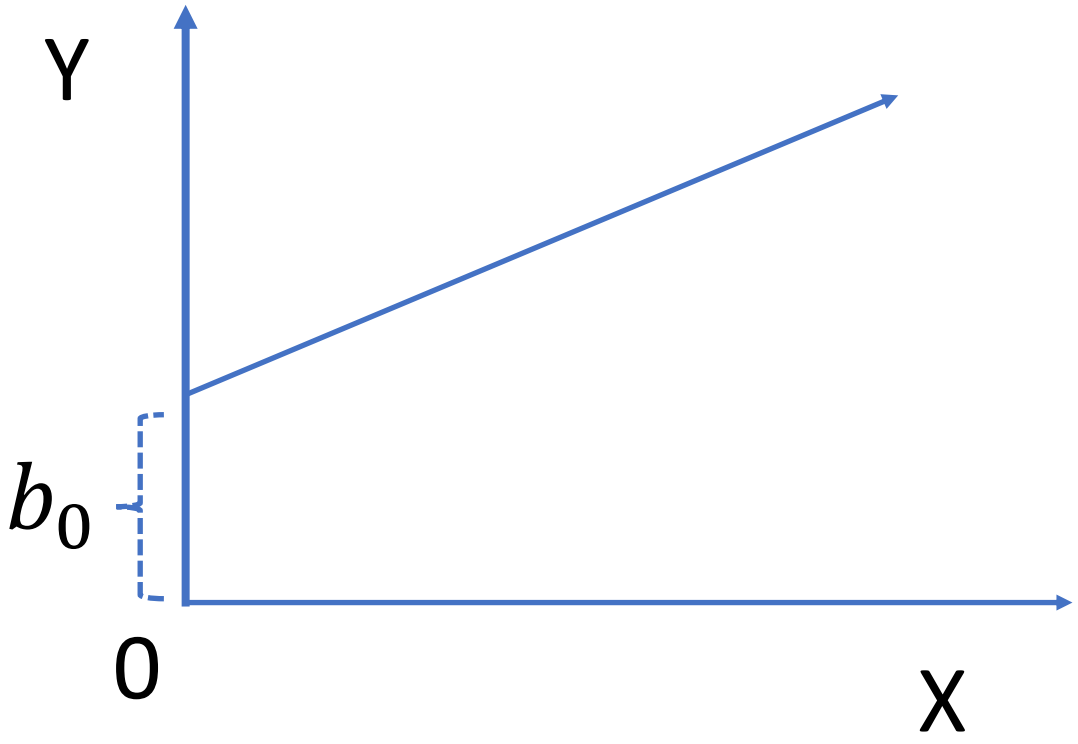
Basic Meaning of Intercept

$$Y = b_0 + b_1 X$$



Intercept (b_0) is the value of Y when X is 0.

How does Centering X Impact Intercept?

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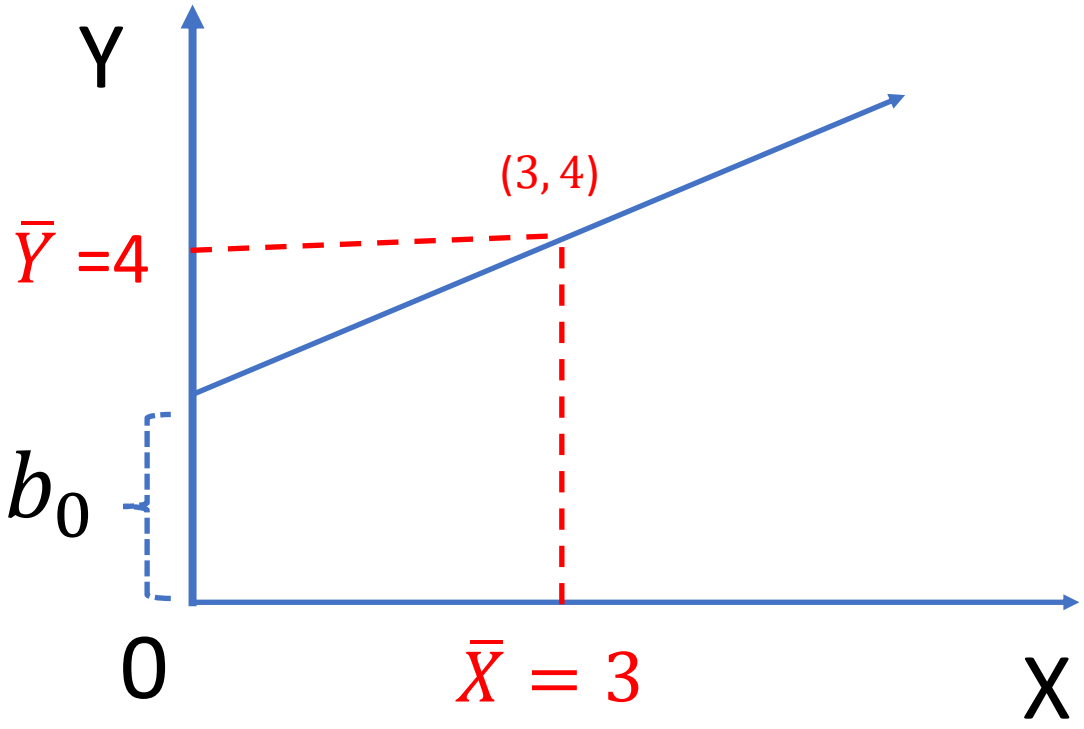
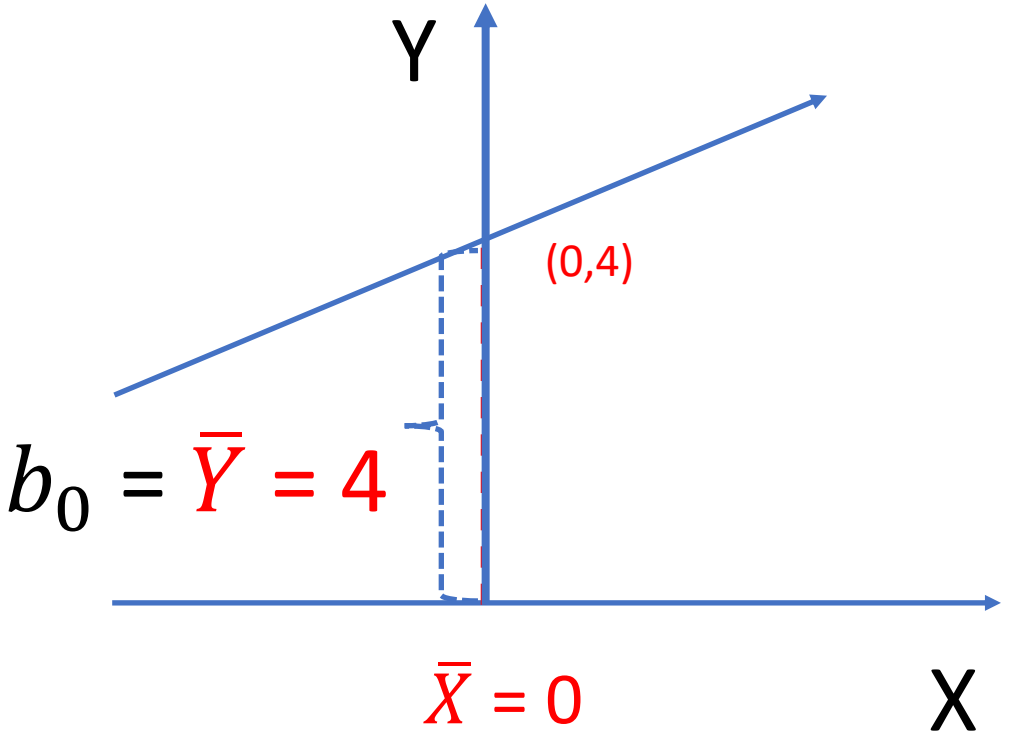
$$Y = b_0 + b_1 X$$

No Centering



Intercept (b_0) is the value of Y when X is 0.

With Centered X



Intercept (b_0) is still the value of Y when X is 0. b_0 is also the mean of Y ($\bar{Y}$).

Conclusions:

1. Before centering, intercept (b_0) is the Y value when X =0.

2. After centering X, intercept (b_0) is still the value of Y when X is 0. But, Intercept (b_0) is also the mean of Y ($\bar{Y}$).

Additional Knowledge:

1. In simple linear regression, a regression line always passes ($\bar{X}$, $\bar{Y}$), regardless of centering X or not.

2. Centering X does not change slope (b_1), but it does change intercept (b_0).