

Prediction Interval for a Future Measurement from A Population

Assumptions

1. The data are Y_1, Y_2, \dots, Y_n where $Y_j = \mu + \epsilon_j$.
2. The ϵ_j are from a $N(0, \sigma^2)$ population.
3. σ^2 is unknown.

Formulas

A level L prediction interval for a future observation is

$\left(\hat{Y}_{new} - \hat{\sigma}(Y_{new} - \hat{Y}_{new})t_{n-1, \frac{1+L}{2}}, \hat{Y}_{new} + \hat{\sigma}(Y_{new} - \hat{Y}_{new})t_{n-1, \frac{1+L}{2}} \right)$, where $\hat{\sigma}(Y_{new} - \hat{Y}_{new}) = S\sqrt{1 + 1/n}$, and $t_{n-1, \frac{1+L}{2}}$ may be obtained from a table of quantiles of the t distribution ([click here](#)).

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