

Mean Square Error = MSE

@wikipedia

Synonym: [Mean Square Deviation \(MSD\)](#) = [Mean Square Error \(MSE\)](#)

[Statistical metric](#) characterizing the [model](#) prediction quality ([goodness of fit](#)) between the [datasets](#) of a given variable x and its [estimator](#) $\hat{x}$:

$$MSE(x, \hat{x}) = \frac{1}{n} \sum_{i=1}^n (x_i - \hat{x}_i)^2$$

where

x	a variable represented by data set
$\hat{x}$	estimator of variable x
$\{x_1, x_2, x_3, \dots x_N\}$	discrete set of numerical samples of variable x
$\{\hat{x}_1, \hat{x}_2, \hat{x}_3, \dots \hat{x}_N\}$	discrete set of predictors for the corresponding samples of variable x

The [MSE](#) is a positive number, making zero for a constant dataset only.

The upper value of [MSE](#) is not limited and defined by the variable and its predictor, which can be troublesome in computations.

There are many normalized measures of prediction quality which are more comfortable for computations, with [Coefficient of determination \(R2\)](#) being the most popular.

The terms [MSD](#) and [MSE](#) are used in mathematics and engineering interchangeably.

See also

[Formal science](#) / [Mathematics](#) / [Statistics](#) / [Statistical Metric](#)

[[Root Mean Square Error \(RMSE\)](#)] [[Coefficient of determination \(R2\)](#)]