How to Calculate RMSE in R: A Step-by-Step Guide

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March 11, 2026

Root mean squared error (RMSE) is a commonly used metric for evaluating the accuracy of a predictive model. In R, it can be calculated using the "rmse" function, which takes in two inputs: the actual values and the predicted values. The function then calculates the square root of the mean of the squared differences between the actual and predicted values. This provides a measure of the average difference between the predicted values and the actual values, with lower values indicating a better fit of the model. Utilizing the "rmse" function in R allows for a quick and efficient way to evaluate the performance of a predictive model.

Calculate RMSE in R

The root mean square error (RMSE) is a metric that tells us how far apart our predicted values are from our observed values in a regression analysis, on average. It is calculated as:

RMSE = √

where:

Σ is a fancy symbol that means "sum"Pi is the predicted value for the ith observation in the datasetOi is the observed value for the ith observation in the datasetn is the sample size

This tutorial explains two methods you can use to calculate RMSE in R.

Method 1: Write Your Own Function

Suppose we have a dataset with one column that contains the actual data values and one column that contains the predicted data values:

```
#create dataset
data <- data.frame(actual=c(34, 37, 44, 47, 48, 48, 46, 43, 32, 27, 26, 24),
predicted=c(37, 40, 46, 44, 46, 50, 45, 44, 34, 30, 22, 23))

#view dataset
data
```

	actual	predicted
1	34	37
2	37	40
3	44	46
4	47	44
5	48	46
6	48	50
7	46	45
8	43	44
9	32	34
10	27	30
11	26	22
12	24	23

To compute the RMSE, we can use the following function:

```
#calculate RMSE
sqrt(mean((data$actual - data$predicted)^2))
```

```
2.43242
```

The root mean square error is 2.43242.

Method 2: Use a Package

We could also calculate RMSE for the same dataset using the rmse() function from the Metrics package, which uses the following syntax:

```
rmse(actual, predicted)
```

where:

actual: actual valuesprediced: predicted values

Here is the syntax we would use in our example:

```
#load Metrics package
library(Metrics)
```

```
calculate RMSE
rmse(data$actual, data$predicted)

2.43242
```

The root mean square error is 2.43242, which matches what we calculated earlier using our own function.

How to Interpret RMSE

RMSE is a useful way to see how well a regression model is able to fit a dataset.

The larger the RMSE, the larger the difference between the predicted and observed values, which means the worse a regression model fits the data. Conversely, the smaller the RMSE, the better a model is able to fit the data.

It can be particularly useful to compare the RMSE of two different models with each other to see which model fits the data better.

RMSE Calculator

How to Calculate MSE in R

How to Calculate MAPE in R