How to calculate Cramer’s V in R?

Authored by

stats writer

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Cramer's V is a measure of the strength of association between two .

It ranges from 0 to 1 where:

0 indicates no association between the two variables.
1 indicates a strong association between the two variables.

It is calculated as:

Cramer's V = √(X2/n) / min(c-1, r-1)

where:

X2: The Chi-square statistic
n: Total sample size
r: Number of rows
c: Number of columns

This tutorial provides a couple examples of how to calculate Cramer's V for a contingency table in R.

Example 1: Cramer's V for a 2×2 Table

The following code shows how to use the **CramerV** function from the **rcompanion** package to calculate Cramer's V for a 2×2 table:

```
#create 2x2 table
data = matrix(c(7,9,12,8), nrow = 2)

#view dataset
data

7 12
9 8

#load rcompanion library
library(rcompanion)

#calculate Cramer's V
cramerV(data)

Cramer V
0.1617
```

Cramer's V turns out to be **0.1617**, which indicates a fairly weak association between the two variables in the table.

Note that we can also produce a confidence interval for Cramer's V by indicating **ci = TRUE**:

cramerV(data, ci = TRUE)

Cramer.V lower.ci upper.ci
1 0.1617 0.003487 0.4914

We can see that Cramer's V remains unchanged at **0.1617**, but we now have a 95% confidence interval that contains a range of values that is likely to contain the true value of Cramer's V.

This interval turns out to be: .

Example 2: Cramer's V for Larger Tables

The following code shows how to calculate Cramer's V for a table with 2 rows and 3 columns:

#create 2x3 table
data = matrix(c(6, 9, 8, 5, 12, 9), nrow = 2)

#view dataset
data

6 8 12
9 5 9

#load rcompanion library
library(rcompanion)

#calculate Cramer's V
cramerV(data)

Cramer V
0.1775

Cramer's V turns out to be **0.1775**.

You can find the complete documentation for the CramerV function .