# TESTING A VARIANCE IN R

By  [**Joseph Schmuller**](https://www.dummies.com/?s=&a=joseph-schmuller)

You might think that the function chisq.test() would be the best way to test a variance in R. Although base R provides this function, it’s not appropriate here. Statisticians use this function to test other kinds of hypotheses.

Instead, turn to a function called varTest, which is in the EnvStats package. On the Packages tab, click Install. Then type **EnvStats** into the Install Packages dialog box and click Install. When EnvStats appears on the Packages tab, select its check box.

Before you use the test, you create a vector to hold the ten measurements:

FarKlempt.data2 <- c(12.43, 11.71, 14.41, 11.05, 9.53, 11.66, 9.33,11.71,14.35,13.81)

And now, the test:

varTest(FarKlempt.data2,alternative="greater",conf.level = 0.95,sigma.squared = 2.25)

The first argument is the data vector. The second specifies the alternative hypothesis that the true variance is greater than the hypothesized variance, the third gives the confidence level (1 – ɑ), and the fourth is the hypothesized variance.

Running that line of code produces these results:

Results of Hypothesis Test  
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Null Hypothesis: variance = 2.25  
Alternative Hypothesis: True variance is greater than 2.25  
Test Name: Chi-Squared Test on Variance

Estimated Parameter(s): variance = 3.245299

Data: FarKlempt.data2

Test Statistic: Chi-Squared = 12.9812

Test Statistic Parameter: df = 9  
P-value: 0.163459  
95% Confidence Interval: LCL = 1.726327

UCL = Inf

Among other statistics, the output shows the chi-square (12.9812) and the p-value (0.163459). (The chi-square value in the previous section is a bit lower because of rounding.) The p-value is greater than .05. Therefore, you cannot reject the null hypothesis.

How high would chi-square (with df = 9) have to be in order to reject? Hmmm. . . .