

# How can Levene's test be performed in Python?

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## RECOMMENDED CITATION

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Levene's test is a statistical method used to assess the equality of variances among multiple groups or samples. It is commonly used in data analysis to determine if there is a significant difference in variability between groups. In Python, Levene's test can be performed using the "levene" function from the "scipy.stats" module. This function takes in the data from the different groups as input and returns the test statistic and p-value. The test statistic can then be compared to the critical value at a chosen significance level to determine if there is a significant difference in variance between the groups. Additionally, visualizations such as box plots can be used to aid in interpreting the results of Levene's test. Overall, performing Levene's test in Python allows for a quick and efficient way to assess the homogeneity of variances in data.

## Perform Levene's Test in Python

**Levene's Test is used to determine whether two or more groups have equal variances. It is commonly used because many statistical tests make the assumption that groups have equal variances and Levene's Test allows you to determine if this assumption is satisfied.**

**This tutorial explains how to perform Levene's Test in Python.**

**Example: Levene's Test in Python**

**Researchers want to know if three different fertilizers lead to different levels of plant growth. They randomly select 30 different plants and split them into three groups of 10, applying a different fertilizer to each group. At the end of one month they measure the height of each plant.**

Use the following steps to perform Levene's Test in Python to determine whether or not the three groups have equal variances.

**Step 1: Input the data.**

First, we'll create three arrays to hold the data values:

```
group1 =  
group2 =  
group3 =
```

**Step 2: Perform Levene's Test.**

Next, we'll perform Levene's Test using the `levene` from the SciPy library, which uses the following syntax:

```
levene(sample1, sample2, ..., center='median')
```

where:

**sample1, sample2, etc:** Names of the samples.  
**center:** Method to use for Levene's test. The default is 'median', but other choices include 'mean' and 'trimmed.'

As mentioned in , there are actually three different

variations of Levene's test you can use. The recommended usages are as follows:

'median': recommended for skewed distributions.  
'mean': recommended for symmetric, moderate-tailed distributions.  
'trimmed': recommended for heavy-tailed distributions.

The following code illustrates how to perform Levene's test using both the mean and the median as the center:

```
import scipy.stats as stats
```

```
#Levene's test centered at the median
```

```
stats.levene(group1, group2, group3, center='median')
```

```
(statistic=0.1798, pvalue=0.8364)
```

```
#Levene's test centered at the mean
```

```
stats.levene(group1, group2, group3, center='mean')
```

```
(statistic=0.5357, pvalue=0.5914)
```

In other words, the three groups have equal variances. If we were to perform some statistical test (like a ) that assumes each group has equal variance, then this

**assumption would be met.**

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