

# Package ‘Hassani.SACF’

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**Type** Package

**Title** Computing Lower Bound of Ljung-Box Test

**Version** 2.0

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**Description** The Ljung-Box test is one of the most important tests for time series diagnostics and model selection. The Hassani SACF (Sum of the Sample Autocorrelation Function) Theorem, however, indicates that the sum of sample autocorrelation function is always fix for any stationary time series with arbitrary length. This package confirms for sensitivity of the Ljung-Box test to the number of lags involved in the test and therefore it should be used with extra caution. The Hassani SACF Theorem has been described in : Hassani, Yeganegi and M. R. (2019) <[doi:10.1016/j.physa.2018.12.028](https://doi.org/10.1016/j.physa.2018.12.028)>.

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Q\_H

*Computing Lower Bound of Ljung-Box Test*

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### **Description**

Because of the sensitivity of the Ljung-Box test to the number of lags involved in the test, this function computes lower bound of this test and draws it's plot.

### **Usage**

```
Q_H(simnum = 10000, TT = 50)
```

### **Arguments**

simnum	number of simulation iterations.
TT	length of time serie.

### **Value**

Lower bound of the Ljung-Box test and it's plot.

### **Author(s)**

Hossein hassani, Masoud yarmohammdi, Mohammad reza yeganegi and Leila Marvian Mashhad.

### **References**

Hassani, H., & Yeganegi, M. R. (2019). "Sum of squared ACF and the Ljung-Box statistics." *Physica A: Statistical Mechanics and Its Applications*, 520, 81-86.

### **See Also**

`Box.test`

### **Examples**

```
Q_H(simnum = 10000, TT = 100)
```

**Description**

The sum of the sample autocorrelation function, found in many standard time series textbooks and software, at lag  $h$  is considered. It is shown that this sum is always minus half for any stationary time series with arbitrary length  $L$ .

**Usage**

```
SACF(x)
```

**Arguments**

$x$  it is stationary time series.

**Value**

A number. It computes SACF.

**Author(s)**

Hossein hassani, Masoud yarmohammdi, Mohammad reza yeganegi and Leila Marvian Mashhad.

**References**

A note on the sum of the sample autocorrelation function Hossein Hassani Statistics Group, Cardiff School of Mathematics, Cardiff University, CF24 4AG, UK 2-Statistical Research and Training Center, Tehran, 1413717911, Iran

**See Also**

`Box.test`

**Examples**

```
x = rnorm(50, mean = 0, sd = 1)
SACF(x)
```

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