

# Package ‘wINEQ’

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**Title** Inequality Measures for Weighted Data

**Version** 1.0.1

**Description** Computes inequality measures of a given variable taking into account weights. Bootstrap method provides distribution of inequality measures and several additional statistics.

**License** GPL-3

**Encoding** UTF-8

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**NeedsCompilation** no

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AF	<i>Allison and Foster</i>
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### Description

Computes Allison and Foster inequality measure of a given variable taking into account weights.

### Usage

```
AF(X, W = rep(1, length(X)))
```

### Arguments

X	is a data vector
W	is a vector of weights

### Value

The value of Allison and Foster coefficient.

### References

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

### Examples

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
AF(X,W)
```

---

Atkinson	<i>Atkinson</i>
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### Description

Computes Atkinson inequality measure of a given variable taking into account weights.

### Usage

```
Atkinson(X, W = rep(1, length(X)), e = 1)
```

**Arguments**

X	is a data vector
W	is a vector of weights
e	is a parameter for calculating the value of the Atkinson coefficient

**Value**

The value of Atkinson coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Atkinson(X,W)
```

---

CoefVar

*CoefVar*

---

**Description**

Computes CoefVar inequality measure of a given variable taking into account weights.

**Usage**

```
CoefVar(X, W = rep(1, length(X)), square = FALSE, na.rm = TRUE)
```

**Arguments**

X	is a data vector
W	is a vector of weights
square	logical, argument of the function CoefVar, for details see below
na.rm	logical, should missing values (NAs) be removed prior to computations? If set to FALSE the computations yield NA

**Value**

The value of CoefVar coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
CoefVar(X,W)
```

---

 Entropy

---

*Entropy*


---

**Description**

Computes Entropy inequality measure of a given variable taking into account weights.

**Usage**

```
Entropy(X, W = rep(1, length(X)), parameter = 0.5, na.rm = TRUE)
```

**Arguments**

X	is a data vector
W	is a vector of weights
parameter	is a entropy parameter
na.rm	logical, should missing values (NAs) be removed prior to computations? If set to FALSE the computations yield NA

**Value**

The value of Entropy coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Entropy(X,W)
```

---

Gini

*Gini*

---

**Description**

Computes Gini inequality measure of a given variable taking into account weights.

**Usage**

```
Gini(X, W = rep(1, length(X)))
```

**Arguments**

X is a data vector  
W is a vector of weights

**Value**

The value of Gini coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)  
W=c(2,5,6,7,3,4,5,2,5)  
Gini(X,W)
```

---

Hoover

*Hoover*

---

**Description**

Computes Hoover inequality measure of a given variable taking into account weights.

**Usage**

```
Hoover(X, W = rep(1, length(X)))
```

**Arguments**

X is a data vector  
W is a vector of weights

**Value**

The value of Hoover coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Hoover(X,W)
```

---

`ineq.weighted`

*ineq.weighted*

---

**Description**

Calculates weighted mean and sum of X, and a set of inequality measures.

**Usage**

```
ineq.weighted(
  X,
  W = rep(1, length(X)),
  Atkinson.e = 1,
  Jenkins.alfa = 0.8,
  Entropy.e = 0.5,
  Kolm.p = 1
)
```

**Arguments**

X	is a data vector
W	is a vector of weights
Atkinson.e	is a parameter for calculating the value of the Atkinson coefficient
Jenkins.alfa	is the Jenkins coefficient parameter
Entropy.e	is a entropy parameter
Kolm.p	is a Kolm parameter

**Value**

The data frame with weighted mean and sum of X, and all inequality measures.

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
ineq.weighted(X,W)
```

---

```
ineq.weighted.boot      ineq.weighted.boot
```

---

**Description**

For weighted mean and weighted total of X as well as for each inequality measure, returns outputs from ineq.weighted and bootstrap outcomes: expected value, bias (in %), standard deviation, coefficient of variation, lower and upper bound of confidence interval.

**Usage**

```
ineq.weighted.boot(
  X,
  W = rep(1, length(X)),
  B = 10,
  Atkinson.e = 1,
  Jenkins.alfa = 0.8,
  Entropy.e = 0.5,
  Kolm.p = 1,
  keepSamples = FALSE,
  keepMeasures = FALSE,
  conf.alpha = 0.05,
  calib.boot = FALSE,
  Xs = rep(1, length(X)),
  total = sum(W),
  calib.method = "truncated"
)
```

**Arguments**

X	is a data vector
W	is a vector of weights
B	numer of bootstrap samples.
Atkinson.e	is a parameter for calculating the value of the Atkinson coefficient
Jenkins.alfa	is the Jenkins coefficient parameter
Entropy.e	is a entropy parameter
Kolm.p	is a Kolm parameter
keepSamples	if TRUE, it returns bootstrap samples of data (Xb) and weights (Wb)

<code>keepMeasures</code>	if TRUE, it returns values of all inequality measures for each bootstrap sample
<code>conf.alpha</code>	significance level for confidence interval
<code>calib.boot</code>	if FALSE, then naive bootstrap is performed, calibrated bootstrap elsewhere
<code>Xs</code>	matrix of calibration variables
<code>total</code>	vector of population totals
<code>calib.method</code>	weights' calibration method for function <code>calib</code> (sampling)

**Value**

By default this functions returns a data frame from `ineq.weighted` for weighted mean and weighted total of `X` as well as for each inequality measure extended with bootstrap results: expected value, bias (in %), standard deviation, coefficient of variation, lower and upper bound of confidence interval. If `keepSamples=TRUE` or `keepMeasures==TRUE` then the output becomes a list. If `keepSamples=TRUE`, the functions returns `Xb` and `Wb`, which are the samples of vector data and the samples of weights, respectively. If `keepMeasures==TRUE`, the functions returns `Mb`, which is a set of inequality measures from bootstrapping.

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
ineq.weighted.boot(X,W)
```

---

 Jenkins

*Jenkins and Cowell\_and\_Flachaire*


---

**Description**

Computes Jenkins and Cowell\_and\_Flachaire inequality measure of a given variable taking into account weights.

**Usage**

```
Jenkins(X, W = rep(1, length(X)), alfa = 0.8)
```

**Arguments**

<code>X</code>	is a data vector
<code>W</code>	is a vector of weights
<code>alfa</code>	is the Jenkins coefficient parameter

**Value**

The value of Jenkins and Cowell\_and\_Flachaire coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9 F A Cowell: Measurement of Inequality, 2000, in A B Atkinson / F Bourguignon (Eds): Handbook of Income Distribution, Amsterdam

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Jenkins(X,W)
```

---

 Kolm

*Kolm*


---

**Description**

Computes Kolm inequality measure of a given variable taking into account weights.

**Usage**

```
Kolm(X, W = rep(1, length(X)), parameter = 1, na.rm = TRUE)
```

**Arguments**

X	is a data vector
W	is a vector of weights
parameter	is a Kolm parameter
na.rm	logical, should missing values (NAs) be removed prior to computations? If set to FALSE the computations yield NA

**Value**

The value of Kolm coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Kolm(X,W)
```

Leti

*Leti*

---

**Description**

Computes Leti inequality measure of a given variable taking into account weights.

**Usage**

```
Leti(X, W = rep(1, length(X)))
```

**Arguments**

X	is a data vector
W	is a vector of weights

**Value**

The value of Leti coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Leti(X,W)
```

---

Palma*Palma*

---

**Description**

Palma proportion - the ratio of the total income of the 10% richest people to the 40% poorest people.

**Usage**

```
Palma(X, W = rep(1, length(X)))
```

**Arguments**

X	is a data vector
W	is a vector of weights

**Value**

The value of Palma coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9 Putting the Gini Back in the Bottle? 'The Palma' as a Policy-Relevant Measure of Inequality

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Palma(X,W)
```

---

 Prop20\_20

 Prop20:20
 

---

**Description**

20:20 ratio - the ratio of thr total income of the 20% richest people to the 20% poorest people.

**Usage**

```
Prop20_20(X, W = rep(1, length(X)))
```

**Arguments**

X is a data vector  
W is a vector of weights

**Value**

The value of 20:20 ratio coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9 Panel Data Econometrics: Theoretical Contributions And Empirical Applications edited by Badi Hani Baltag Notes on Statistical Sources and Methods - The Equality Trust.

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Prop20_20(X,W)
```

---

RicciSchutz

*RicciSchutz*

---

### Description

Computes RicciSchutz inequality measure of a given variable taking into account weights.

### Usage

```
RicciSchutz(X, W = rep(1, length(X)), na.rm = TRUE)
```

### Arguments

X	is a data vector
W	is a vector of weights
na.rm	logical, should missing values (NAs) be removed prior to computations? If set to FALSE the computations yield NA

### Value

The value of RicciSchutz coefficient.

### References

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9

### Examples

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
RicciSchutz(X,W)
```

---

Theil\_L

*Theil L*

---

### Description

Computes Theil\_L inequality measure of a given variable taking into account weights.

### Usage

```
Theil_L(X, W = rep(1, length(X)))
```

**Arguments**

X is a data vector  
 W is a vector of weights

**Value**

The value of Theil\_L coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9 A. Serebrenik, M. van den Brand. Theil index for aggregation of software metrics values. 26th IEEE International Conference on Software Maintenance. IEEE Computer Society.

**Examples**

```
X=c(1,2,3,4,5,6,7,8,9)
W=c(2,5,6,7,3,4,5,2,5)
Theil_L(X,W)
```

---

 Theil\_T

*Theil T*


---

**Description**

Computes Theil\_T inequality measure of a given variable taking into account weights.

**Usage**

```
Theil_T(X, W = rep(1, length(X)))
```

**Arguments**

X is a data vector  
 W is a vector of weights

**Value**

The value of Theil\_T coefficient.

**References**

Philip B. Coulter: (1989) Measuring Inequality ISBN 0-8133-7726-9 A. Serebrenik, M. van den Brand. Theil index for aggregation of software metrics values. 26th IEEE International Conference on Software Maintenance. IEEE Computer Society.

**Examples**

$X=c(1,2,3,4,5,6,7,8,9)$

$W=c(2,5,6,7,3,4,5,2,5)$

$Theil\_T(X,W)$

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