Package 'iIneq'

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Type Package

Title Computing Individual Components of the Gini and the Theil Indices

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Description Computes individual contributions to the overall Gini and Theil's T and Theil's L measures and their decompositions by groups such as race, gender, national origin, with the three functions of iGini(), iTheiT(), and iTheilL(). For details, see Tim F. Liao (2019) <doi:10.1177/0049124119875961>.

License GPL-2

Depends R (>= 3.6.0), foreach(>= 1.4.8), parallel, doParallel(>= 1.0.15)

Encoding UTF-8

LazyData true

RoxygenNote 7.0.2

NeedsCompilation no

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iGini *Individual decomposition of the Gini Index*

Description

The function computes individual components of the Gini index and their group-based decompositions. It takes as input an outcome variable, a grouping variable, and an optional sampling weight. It returns a data matrix of three columns containg individual contributions and their between- and within-group components. Because iGini is computational insensive, parallel processing is recommended, and the number of cores can be specified.

Usage

```
iGini(x, g, w=rep(1,length(x)),core=1)
```

Arguments

x	Input continuous variable such as income.
g	A grouping variable containing integers, such gender coded 1 & 2.
w	An optional sampling weight variable.
core	An optional input for specifying the number of processing cores in your computer. When specified, you will need to have the **doParallel** package and the **foreach** package installed for conducting parallel processing to speed up the computation.

Value

The function outputs three variables, *g.i*, *g.ikb*, and *g.ikw*.

g.i	This variable gives the individual contribtions to the overall Gini index.
g.ikb	This variable provides for each individual component of the Gini its between-group subcomponent.
g.ikw	This variable provides for each individual component of the Gini its within-group subcomponent. The g.ikb and g.ikw sum up to g.i for each i observation.

References

Tim F. Liao. 2019. "Individual Components of Three Inequality Measures for Analyzing Shapes of Inequality." *Sociological Methods & Research* Advance online publication. doi:10.1177/0049124119875961

Examples

```
data(ChickWeight)
attach(ChickWeight)
iGini.result <- iGini(weight,Diet,core=1)
```

iTheilL *Individual decomposition of Theil's L Index*

Description

The function computes individual components of Theil's L index (or Theil's second measure) and their group-based decompositions. It takes as input an outcome variable, a grouping variable, and an optional sampling weight. It returns a data matrix of three columns containg individual contributions and their between- and within-group components.

Usage

```
iTheilL(x, g, w=rep(1,length(x)))
```

Arguments

x	Input continuous variable such as income.
g	A grouping variable containing integers, such gender coded 1 & 2.
w	An optional sampling weight variable.

Value

The function outputs three variables, *g.i*, *g.ikb*, and *g.ikw*.

g.i	This variable gives the individual contribtions to the overall Gini index.
g.ikb	This variable provides for each individual component of the Gini its between-group subcomponent.
g.ikw	This variable provides for each individual component of the Gini its within-group subcomponent. The g.ikb and g.ikw sum up to g.i for each i observation.

References

Tim F. Liao. 2019. "Individual Components of Three Inequality Measures for Analyzing Shapes of Inequality." *Sociological Methods & Research* Advance online publication. doi:10.1177/0049124119875961

Examples

```
data(ChickWeight)
attach(ChickWeight)
iTheilL.result <- iTheilL(weight,Diet)
```

iTheilT *Individual decomposition of Theil's T Index*

Description

The function computes individual components of Theil's T index (or Theil's first measure) and their group-based decompositions. It takes as input an outcome variable, a grouping variable, and an optional sampling weight. It returns a data matrix of three columns containg individual contributions and their between- and within-group components.

Usage

```
iTheilT(x, g, w=rep(1,length(x)))
```

Arguments

x	Input continuous variable such as income.
g	A grouping variable containing integers, such gender coded 1 & 2.
w	An optional sampling weight variable.

Value

The function outputs three variables, *g.i*, *g.ikb*, and *g.ikw*.

g.i	This variable gives the individual contribtions to the overall Gini index.
g.ikb	This variable provides for each individual component of the Gini its between-group subcomponent.
g.ikw	This variable provides for each individual component of the Gini its within-group subcomponent. The g.ikb and g.ikw sum up to g.i for each i observation.

References

Tim F. Liao. 2019. "Individual Components of Three Inequality Measures for Analyzing Shapes of Inequality." *Sociological Methods & Research* Advance online publication. doi:10.1177/0049124119875961

Examples

```
data(ChickWeight)
attach(ChickWeight)
iTheilT.result <- iTheilT(weight,Diet)
```

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