Package ‘TSEwgt’

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Type Package

Title Total Survey Error Under Multiple, Different Weighting Schemes

Version 0.1.0

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Description Calculates total survey error (TSE) for a survey under multiple, different weighting schemes, using both scale-dependent and scale-independent metrics. Package works directly from the data set, with no hand calculations required: just upload a properly structured data set (see TESTWGT and its documentation), properly input column names (see functions documentation), and run your functions. For more on TSE, see: Weisberg, Herbert (2005, ISBN:0-226-89128-3); Biemer, Paul (2010) <doi:10.1093/poq/nfq058>; Biemer, Paul et.al. (2017, ISBN:9781119041672); etc.

Note 'TSEwgt' is a companion package to 'TSE'. Each package calculates TSE, but the former for multiple, different surveys, and the latter for a single survey under multiple, different weighting schemes.

Imports stats

Depends R (>= 3.5)

License GPL (>= 2)

Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

Suggests knitr, rmarkdown

NeedsCompilation no

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R topics documented:

AVEMAEw 2
AVEMAEm

Description

Calculates average mean absolute error (aMAE) under multiple, different weighting schemes.

Usage

AVEMAEm(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())

Arguments

- Actual: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey.
- Survey: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual.
- Weights: weights to be applied to Survey data; objects are weights columns.

Details

- aMAE for weighting scheme # => mean value of the MAEs for specified variables under weighting scheme # => mean value of MAEs for objects in Survey=data.frame() * objects in Weights=data.frame().

Value

- Average mean absolute error (aMAE) under multiple, different weighting schemes.

Note

- Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.
AVEMAPEw

Examples

AVEMAPEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
          Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
          Weights=data.frame(TESTWGT$W1, TESTWGT$W2))

AVEMAPEw

Average mean absolute percentage error (aMAPE)

Description

Calculates average mean absolute percentage error (aMAPE) under multiple, different weighting schemes

Usage

AVEMAPEw(Actual = data.frame(), Survey = data.frame(),
          Weights = data.frame())

Arguments

Actual data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey

Survey data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual

Weights weights to be applied to Survey data; objects are weights columns

Details

aMAPE for weighting scheme # => mean value of the aMAPEs for specified variables under weighting scheme # => mean value of aMAPEs for objects in Survey=data.frame() * objects in Weights=data.frame()

Value

Average mean absolute percentage error (aMAPE) under multiple, different weighting schemes

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

AVEMAPEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
          Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
          Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
AVEMSEw

Average mean squared error (aMSE) with bias-variance decomposition

Description

Calculates average mean squared error (aMSE) with bias-variance decomposition under multiple, different weighting schemes

Usage

AVEMSEw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())

Arguments

Actual  
data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey

Survey  
data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual

Weights  
weights to be applied to Survey data; objects are weights columns

Details

aMSE for weighting scheme # => mean value of the MSEs for specified variables under weighting scheme # => mean value of MSEs for objects in Survey=data.frame() + objects in Weights=data.frame()

Value

Average mean squared error (aMSE) with bias-variance decomposition under multiple, different weighting schemes

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

AVEMSEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
AVEMSLEw

Average mean squared logarithmic error (aMSLE)

Description
Calculates average mean squared logarithmic error (aMSLE) under multiple, different weighting schemes.

Usage

AVEMSLEw(Actual = data.frame(), Survey = data.frame(), Weights = data.frame())

Arguments

Actual  
data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey

Survey  
data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual

Weights  
weights to be applied to Survey data; objects are weights columns

Details

aMSLE for weighting scheme # => mean value of the aMSLEs for specified variables under weighting scheme # => mean value of aMSLEs for objects in Survey=data.frame() * objects in Weights=data.frame()

Value

Average mean squared logarithmic error (aMSLE) under multiple, different weighting schemes

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

AVEMSLEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2), Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2), Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
**Average relative absolute error (aRAE)**

### Description
Calculates average relative absolute error (aRAE) under multiple, different weighting schemes.

### Usage
```r
AVERAEw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())
```

### Arguments
- **Actual**: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey.
- **Survey**: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual.
- **Weights**: weights to be applied to Survey data; objects are weights columns.

### Details
- aRAE for weighting scheme # => mean value of the aRAEs for specified variables under weighting scheme # => mean value of aRAEs for objects in Survey=data.frame() * objects in Weights=data.frame().

### Value
Average relative absolute error (aRAE) under multiple, different weighting schemes.

### Note
Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

### Examples
```r
AVERAEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
```
**AVERMSEw**

**Average root mean squared error (aRMSE)**

**Description**

Calculates average root mean squared error (aRMSE) under multiple, different weighting schemes

**Usage**

AVERMSEw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())

**Arguments**

- **Actual**
  data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey
- **Survey**
  data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
- **Weights**
  weights to be applied to Survey data; objects are weights columns

**Details**

aRMSE for weighting scheme # => mean value of the RMSEs for specified variables under weighting scheme # => mean value of RMSEs for objects in Survey=data.frame() * objects in Weights=data.frame()

**Value**

Average root mean squared error (aRMSE) under multiple, different weighting schemes

**Note**

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

**Examples**

AVERMSEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
AVERMSLEw

Average root mean squared logarithmic error (aRMSLE)

Description

Calculates average root mean squared logarithmic error (aRMSLE) under multiple, different weighting schemes.

Usage

AVERMSLEw(Actual = data.frame(), Survey = data.frame(), Weights = data.frame())

Arguments

- **Actual**: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns survey
- **Survey**: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
- **Weights**: weights to be applied to Survey data; objects are weights columns

Details

aRMSLE for weighting scheme # => mean value of the aRMSLEs for specified variables under weighting scheme # => mean value of aRMSLEs for objects in Survey=data.frame() * objects in Weights=data.frame()

Value

Average root mean squared logarithmic error (aRMSLE) under multiple, different weighting schemes

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

AVERMSLEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2), Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2), Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
AVERRSEw

### Description
Calculates average root relative squared error (aRRSE) under multiple, different weighting schemes

### Usage
```
AVERRSEw(Actual = data.frame(), Survey = data.frame(),
          Weights = data.frame())
```

### Arguments
- **Actual**: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey
- **Survey**: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
- **Weights**: weights to be applied to Survey data; objects are weights columns

### Details
- aRRSE for weighting scheme # => mean value of the aRRSEs for specified variables under weighting scheme # => mean value of aRRSEs for objects in Survey=data.frame() * objects in Weights=data.frame()

### Value
Average root relative squared error (aRRSE) under multiple, different weighting schemes

### Note
Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

### Examples
```
AVERRSEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
          Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
          Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
```


\begin{center}

| AVERSEw | Average relative squared error (aRSE) |

\end{center}

**Description**

Calculates average relative squared error (aRSE) under multiple, different weighting schemes

**Usage**

\begin{verbatim}
AVERSEw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())
\end{verbatim}

**Arguments**

- **Actual**: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey
- **Survey**: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
- **Weights**: weights to be applied to Survey data; objects are weights columns

**Details**

aRSE for weighting scheme # => mean value of the aRSEs for specified variables under weighting scheme # => mean value of aRSEs for objects in Survey=data.frame() * objects in Weights=data.frame()

**Value**

Average relative squared error (aRSE) under multiple, different weighting schemes

**Note**

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

**Examples**

\begin{verbatim}
AVERSEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
\end{verbatim}
AVESMAPEw

Average symmetric mean absolute percentage error (aSMAPE)

Description

Calculates average symmetric mean absolute percentage error (aSMAPE) under multiple, different weighting schemes

Usage

AVESMAPEw(Actual = data.frame(), Survey = data.frame(), Weights = data.frame())

Arguments

Actual data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey

Survey data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual

Weights weights to be applied to Survey data; objects are weights columns

Details

aSMAPE for weighting scheme # => mean value of the aSMAPEs for specified variables under weighting scheme # => mean value of aSMAPEs for objects in Survey=data.frame() * objects in Weights=data.frame()

Value

Average symmetric mean absolute percentage error (aSMAPE) under multiple, different weighting schemes

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

AVESMAPEw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2), Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2), Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
FULLSDw  

**Description**
Calculates full scale-dependent statistics

**Usage**
```
FULLSDw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())
```

**Arguments**
- **Actual**: data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey
- **Survey**: data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
- **Weights**: weights to be applied to Survey data; objects are weights columns

**Value**
Full scale-dependent statistics

**Note**
Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

**Examples**
```
FULLSDw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))
```

FULLSIw  

**Description**
Calculates full scale-independent statistics
Usage

FULLSiw(Actual = data.frame(), Survey = data.frame(),
Weights = data.frame())

Arguments

Actual data from a "gold standard" survey; objects are variable columns from "gold standard" survey that correspond to variable columns Survey
Survey data from a survey; objects are variable columns from a survey that correspond to variable columns from Actual
Weights weights to be applied to Survey data; objects are weights columns

Value

Full scale-independent statistics

Note

Make sure to properly order inputs, per the example: Actual=data.frame() objects and corresponding Survey=data.frame() objects must be given in the same order as each other; and Weights=data.frame() objects must be given in sequence of weighting scheme #.

Examples

FULLSiw(Actual=data.frame(TESTWGT$A1, TESTWGT$A2),
Survey=data.frame(TESTWGT$Q1, TESTWGT$Q2),
Weights=data.frame(TESTWGT$W1, TESTWGT$W2))

TESTWGT A data set created by merging 1) "actual" data from a "gold standard" survey (A1, A2), and 2) data from another survey (Q1, Q2), including weights columns for that data (W1, W2). A1/Q1 and A2/Q2 are responses to the same two questions, asked to the same 10 respondents (ID), along the same 1-99 response scale.

Description

A data set created by merging 1) "actual" data from a "gold standard" survey (A1, A2), and 2) data from another survey (Q1, Q2), including weights columns for that data (W1, W2). A1/Q1 and A2/Q2 are responses to the same two questions, asked to the same 10 respondents (ID), along the same 1-99 response scale.

Usage

TESTWGT
Format

A data frame with 10 rows and 7 variables

**ID, A1, A2, Q1, Q2, W1, W2** Paired "actual"/survey data with weights columns for survey data

Source

Example data generated by author
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