## Package `CCWeights`

### June 11, 2021

**Type** Package  
**Title** Perform Weighted Linear Regression for Calibration Curve  
**Version** 0.1.3  
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**Description** Automated assessment and selection of weighting factors for accurate quantification using linear calibration curve. In addition, a 'shiny' App is provided, allowing users to analyze their data using an interactive graphical user interface, without any programming requirements.  
**Depends** R (>= 3.5.0)  
**Imports** plotly, dplyr, stats, magrittr, shiny, bs4Dash, fresh, DT, tools, readxl, rmarkdown, readr  
**License** GPL-3  
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doEvaluation

Evaluate Different Weighting Factors

Description
Evaluate different weighting factors.

Usage
doEvaluation(DF, p = 0.05, userWeights = NULL)

doCalibration
Perform Calibration

Description
Perform calibration

Usage
docalibration(DF, weights = NULL)

Arguments
DF: data frame, it must contain a column named 'Concentration' and a column named 'Response'
weights: default is NULL

Value
dataframe, the quantification result

Author(s)
Yonghui Dong

Examples
Concentration <- rep(c(10, 50, 100, "unknown"), each = 3)
Response <- c(133, 156, 177, 6650, 7800, 8850, 13300, 15600, 17700, 156, 1450, 1400)
DF <- cbind.data.frame(Concentration = Concentration, Response = Response)
result <- doCalibration(DF)
doFtest

**Arguments**

- **DF**
  - data frame, it must contain a column named 'Concentration' and a column named 'Response'
- **p**
  - p-value, default is 0.05
- **userWeights**
  - user defined weights in linear regression, default is NULL. User can easily define weights, e.g., "1/x", "1/x^2", "1/y"

**Value**

dataframe, weighting factor evaluation result

**Author(s)**

Yonghui Dong

**Examples**

```r
Concentration <- rep(c(10, 50, 100, 500), each = 3)
Response <- c(133, 156, 177, 1300, 1450, 1600, 4000, 3881, 3700, 140000, 139000, 140000)
DF <- cbind.data.frame(Concentration = Concentration, Response = Response)
result <- doEvaluation(DF)
```

---

**doFtest**

*Perform F Test*

**Description**

perform F test to evaluate homoscedasticity.

**Usage**

```r
doFtest(DF, p = 0.01, lower.tail = FALSE)
```

**Arguments**

- **DF**
  - data frame, it must contain a column named 'Concentration' and a column named 'Response'
- **p**
  - p-value
- **lower.tail**
  - default is FALSE

**Value**

dataframe, F test result

**Author(s)**

Yonghui Dong
Examples

Concentration <- rep(c(10, 50, 100, 500), each = 3)
Response <- c(133, 156, 177, 1300, 1450, 1600, 4000, 3881, 3700, 140000, 139000, 140000)
DF <- cbind.data.frame(Concentration, Response)
result <- doFtest(DF, p = 0.01)

---

**doWlm**

*Perform Weighted Linear Regression*

Description

Perform weighted linear regression and evaluate by using summed residual.

Usage

doWlm(DF, weights = NULL)

Arguments

DF  
data frame, it must contain a column named 'Concentration' and a column named 'Response'
weights  
the weights used in linear regression, default is NULL. User can easily define weights, e.g., "1/x", "1/x^2", "1/y"

Value

list, weighted linear regression result

Author(s)

Yonghui Dong

Examples

Concentration <- rep(c(10, 50, 100, 500), each = 3)
Response <- c(133, 156, 177, 1300, 1450, 1600, 4000, 3881, 3700, 140000, 139000, 140000)
DF <- cbind.data.frame(Concentration = Concentration, Response = Response)
result <- doWlm(DF, weights = "1/x^2")
expData

Description

Two example data set: one with internal standards (IS), and one without IS

Usage

expData

Format

A list with 2 data frames:

noSTD  the example data without IS
STD    the example data with IS

runGui

Run CCWeights Gui

Description

Run CCWeights Gui.

Usage

runGui()

Value

Gui

Author(s)

Yonghui Dong

Examples

if(interactive()){}
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