Package 'POV'

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Type Package

Title Partition of Variation Variance Component Analysis Method

Version 0.1.4

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Description An implementation of the Partition Of variation (POV) method as
developed by Dr. Thomas A Little <https://thomasalittleconsulting.com> in
1993 for the analysis of semiconductor data for hard drive manufacturing.
POV is based on sequential sum of squares and is an exact method that
explains all observed variation. It quantitates both the between and within
factor variation effects and can quantitate the influence of both continuous
and categorical factors.

URL https://github.com/PaulAntonDeen/POV-R-Package,

https://thomasalittleconsulting.com

BugReports https://github.com/PaulAntonDeen/POV-R-Package/issues

License GPL-3

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

Suggests testthat, knitr, rmarkdown

Imports broom, formula.tools, stats

Depends R (>= 2.10)

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

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Contents

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dt
Dataset for variance component analysis

Description

Looking at the effect of Machine and Metrology on the variation in the response.

Usage

```
dt
```

Format

A data frame with 54 rows and 3 variables:

Machine 3 Levels of different machines used for production

Metrology 3 Levels of different metrology used for measurement

Response Measured value of the characteristic under investigation

Source

Simulated data

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dt2
Dataset for single factor variance component analysis, used in vignette

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Description

Dataset for single factor variance component analysis, used in vignette

Usage

```
dt2
```

Format

A data frame with 36 rows and 2 variables:

Group 3 Level Factor

Response Measured value of the characteristic under investigation

Source

Simulated data

POV *Partition of Variation*

Description

Partition of Variation

Usage

```
POV(Formula, Data, Complete = FALSE)
```

Arguments

Formula	an object of class "formula" (or one that can be coerced to that class): a symbolic description of the model to be fitted. The details of model specification are given under 'Details'.
Data	a data frame, list or environment (or object coercible by as.data.frame to a data frame) containing the variables in the model.
Complete	(Default False) an optional boolean to change the result output. True will give you a table including between, within and total summary values. False will only give you the variance components themselves.

Details

Models for pov are specified symbolically. A typical model has the form response ~ terms where response is the (numeric) response vector and terms is a series of terms which specifies a linear predictor for response. A terms specification of the form first + second indicates all the terms in first together with all the terms in second with duplicates removed. A specification of the form first:second indicates the set of terms obtained by taking the interactions of all terms in first with all terms in second. The specification first*second indicates the cross of first and second. This is the same as first + second + first:second.

Variables on the right hand side of the model should be converted to factors before running.

Between variance is the variance due to change in Mean. Within variance is the variance due to the change in StdDev. Common variance is the minimum variance common to all categories.

Value

POV returns a table of variance components.

Examples

```
POV(Response ~ Machine * Metrology, Data = dt, Complete = TRUE)
```

VarTable   *Summary table from dt, used for vignette*

Description

Summary table from dt, used for vignette

Usage

```
VarTable
```

Format

A data frame with 9 rows and 5 variables:

Machine 3 Levels of different machines used for production

Metrology 3 Levels of different metrology used for measurement

rowVariance Sample variance of the respone

rowN Sample size of the response at each factor combination

popVar Sample variance rescaled to population variance by multypling by (N-1)/N

Source

Simulated data

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