

# 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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dt	<i>Dataset for variance component analysis</i>
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### 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	<i>Dataset for single factor variance component analysis, used in vignette</i>
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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

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POV *Partition of Variation*

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**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 <code>as.data.frame</code> 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)
```

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VarTable

*Summary table from dt, used for vignette*

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**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 response

**rowN** Sample size of the response at each factor combination

**popVar** Sample variance rescaled to population variance by multiplying by  $(N-1)/N$

**Source**

Simulated data

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