

Package ‘manta’

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Title Multivariate Asymptotic Non-Parametric Test of Association

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Description The Multivariate Asymptotic Non-parametric Test of Association (MANTA) enables non-parametric, asymptotic P-value computation for multivariate linear models. MANTA relies on the asymptotic null distribution of the PERMANOVA test statistic. P-values are computed using a highly accurate approximation of the corresponding cumulative distribution function. Garrido-Martín et al. (2022) <[doi:10.1101/2022.06.06.493041](https://doi.org/10.1101/2022.06.06.493041)>.

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Encoding UTF-8

Depends R (>= 3.3.2)

Suggests testthat

LazyData true

URL <https://github.com/dgarrimar/manta>

BugReports <https://github.com/dgarrimar/manta/issues>

RoxygenNote 7.2.3

NeedsCompilation yes

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biomarkers

Simulated Measurements of Five Disease Biomarkers

Description

A simulated dataset containing the levels of 5 biomarkers, measured in 100 individuals, with different scales. Missing observations appear as NA.

Usage

```
data(biomarkers)
```

Format

A matrix with 100 rows and 5 numerical variables:

biomarker1 levels of biomarker1

biomarker2 levels of biomarker2

...

Author(s)

Diego Garrido-Martín

manta

Non-parametric, Asymptotic P-values for Multivariate Linear Models

Description

Fits a multivariate linear model and computes test statistics and asymptotic P-values for predictors in a non-parametric manner.

Usage

```
manta(  
  formula,  
  data,  
  transform = "none",  
  type = "II",  
  contrasts = NULL,  
  subset = NULL,  
  fit = FALSE  
)
```

Arguments

formula	object of class <code>"formula"</code> (or one that can be coerced to that class): a symbolic description of the model to be fitted.
data	an optional data frame, list or environment (or object coercible by <code>as.data.frame</code> to a data frame) containing the variables in the model. If not found in data, the variables are taken from <code>environment(formula)</code> , typically the environment from which <code>manta</code> is called.
transform	transformation of the response variables: <code>"none"</code> , <code>"sqrt"</code> or <code>"log"</code> . Default is <code>"none"</code> .
type	type of sum of squares: <code>"I"</code> , <code>"II"</code> or <code>"III"</code> . Default is <code>"II"</code> .
contrasts	an optional list. See <code>contrasts.arg</code> in <code>model.matrix.default</code> . Default is <code>"contr.sum"</code> for ordered factors and <code>"contr.poly"</code> for unordered factors. Note that this is different from the default setting in <code>options("contrasts")</code> .
subset	subset of predictors for which summary statistics will be reported. Note that this is different from the <code>"subset"</code> argument in <code>lm</code> .
fit	logical. If <code>TRUE</code> the multivariate fit on transformed and centered responses is returned.

Details

A Y matrix is obtained after transforming (optionally) and centering the original response variables. Then, the multivariate fit obtained by `lm` can be used to compute sums of squares (type-I, type-II or type-III), pseudo-F statistics and asymptotic P-values for the terms specified by the formula in a non-parametric manner. The designations "type-II" and "type-III" correspond exactly to those used in `Anova`. "type-I" refers to sequential sums of squares.

Value

`manta` returns an object of class `"manta"`, a list containing:

call	the matched call.
aov.tab	ANOVA table with Df, Sum Sq, Mean Sq, F values, partial R-squared and P-values.
type	the type of sum of squares (<code>"I"</code> , <code>"II"</code> or <code>"III"</code>).
precision	the precision in P-value computation.
transform	the transformation applied to the response variables.
na.omit	incomplete cases removed (see <code>na.omit</code>).
fit	if <code>fit = TRUE</code> the multivariate fit done on the transformed and centered response variables is also returned.

Author(s)

Diego Garrido-Martín

See Also

`lm`, `Anova`

patients

Simulated Metadata for 100 Patients

Description

A simulated dataset containing the age, gender and disease status of 100 individuals. Missing observations appear as NA.

Usage

```
data(patients)
```

Format

A matrix with 100 rows and 3 variables:

age Age of the patient (numerical)

gender Gender of the patient (factor with levels: "male" and "female")

status Disease status of the patient (ordered factor with levels: "healthy", "mild" and "severe")

Author(s)

Diego Garrido-Martín

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