Package: aaltobda (via r-universe)

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Type Package

Title Functionality and Data for the Aalto Course on Bayesian Data Analysis

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Description Functionality and Data for the Aalto University Course on Bayesian Data Analysis.

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Depends R (>= 3.5.0)

Imports checkmate, stats

Suggests ggplot2, testthat

RoxygenNote 7.2.3

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RemoteUrl https://github.com/avehtari/BDA_course_Aalto

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Contents

`algae` *algae*

Description

Algae data set. The data contains the status of algae in 274 measurement sites in Finnish lakes and rivers.

Usage

```
algae
```

Format

A vector with 274 elements:

1 Algae present

0 No algae present

`bioassay` *bioassay*

Description

Bioassay data set. Taken from Table 3.1 in the BDA book

Usage

```
bioassay
```

Format

A data frame with 4 rows and 3 variables:

x dose [log g/ml]

n number of animals

y number of deaths

bioassaylp *Unnormalized log-posterior for bioassay, assuming uniform prior*

Description

Unnormalized log-posterior for bioassay, assuming uniform prior

Usage

```
bioassaylp(alpha, beta, x, y, n)
```

Arguments

alpha	intercept parameter in the dose-response model (vector or single number)
beta	slope parameter in the dose-response model (vector or single number)
x	vector of doses for each observation
y	vector of number of deaths for each observation
n	vector of number of animals for each observation

bioassay_posterior *bioassay_posterior*

Description

Sample from the posterior of the bioassay model.

Usage

```
bioassay_posterior
```

Format

A data frame with 1000 rows and 2 variables:

alpha Parameter of the bioassay model

beta Parameter of the bioassay model

dmvnorm *Computes the density of a multivariate normal distribution*

Description

Computes the density of a multivariate normal distribution

Usage

```
dmvnorm(x, mean, sigma, log = FALSE)
```

Arguments

x	vector or matrix of values for which the density is computed. If x is a vector, it represents a single draw. If x is a matrix, each row is taken to be a single draw.
mean	mean vector
sigma	covariance matrix
log	logical indicating whether to return on the log scale or not. False by default.

Value

Densities of the draws x.

drowning *drowning*

Description

drowning data set. The data contains the number of people who have drowned per year in Finland between 1980 and 2016.

Usage

```
drowning
```

Format

A data frame with 37 rows and 2 variables:

year year

drownings number of drownings in Finland

factory *factory*

Description

factory data set. The data contains quality control measurements from 6 machines in a factory.

Usage

```
factory
```

Format

A data frame with 5 rows and 6 variables:

V1 Machine 1

V2 Machine 2

V3 Machine 3

V4 Machine 4

V5 Machine 5

V6 Machine 6

kilpisjarvi *kilpisjarvi*

Description

Kilpisjärvi data set. The data contains the Kilpisjärvi summer month temperatures 1952–2013. Kilpisjärvi is in very northern part of Finland. Data by Finnish Meteorological Institute (CC-BY 4.0). Name of the observation station in FMI database is "Enontekiö Kilpisjärvi kyläkeskus"

Usage

```
kilpisjarvi
```

Format

A data frame with 62 rows and 5 columns:

year Year

temp.june Average temperature in June

temp.july Average temperature in July

temp.august Average temperature in August

temp.summer Average temperature in July–August

kilpisjarvi2022 *kilpisjarvi2022*

Description

Kilpisjärvi data set. The data contains the Kilpisjärvi summer month temperatures 1952–2022. Kilpisjärvi is in very northern part of Finland. Data by Finnish Meteorological Institute (CC-BY 4.0). Name of the observation station in FMI database is "Enontekiö Kilpisjärvi kyläkeskus"

Usage

```
kilpisjarvi2022
```

Format

A data frame with 71 rows and 5 columns:

year Year

temp.june Average temperature in June

temp.july Average temperature in July

temp.august Average temperature in August

temp.summer Average temperature in July–August

log1m_inv_logit *Implementation of log(1 - 1 / (1 + exp(-x))) robust to over- and under-flow*

Description

Implementation of log(1 - 1 / (1 + exp(-x))) robust to over- and under-flow

Usage

```
log1m_inv_logit(x)
```

Arguments

x	numeric input

log_inv_logit *Implementation of log(1 / (1 + exp(-x))) robust to over- and under-flow*

Description

Implementation of log(1 / (1 + exp(-x))) robust to over- and under-flow

Usage

```
log_inv_logit(x)
```

Arguments

x	numeric input

mcse_quantile *Computes MCSE for quantile estimates based on independent draws*

Description

Computes MCSE for quantile estimates based on independent draws

Usage

```
mcse_quantile(draws, prob)
```

Arguments

draws	Monte Carlo draws
prob	probability for which quantiles is computed

rmvnorm *Produces random draws from a multivariate normal distribution*

Description

Produces random draws from a multivariate normal distribution

Usage

```
rmvnorm(n, mean, sigma)
```

Arguments

n	number of draws
mean	mean vector
sigma	covariance matrix

StudentT *The Student-t Distribution*

Description

Density, distribution function, quantile function and random generation for the Student-t distribution with location/mean `mean`, scale `scale`, and degrees of freedom `df`. See https://en.wikipedia.org/wiki/Location%E2%80%93scale_family for more details on how to get from the standard t-distribution to the t-distribution with additional location and scale parameters.

Usage

```
dtnew(x, df, mean = 0, scale = 1, log = FALSE)

ptnew(q, df, mean = 0, scale = 1, lower.tail = TRUE, log.p = FALSE)

qtnew(p, df, mean = 0, scale = 1)

rtnew(n, df, mean = 0, scale = 1)
```

Arguments

`x, q`	Vector of quantiles.
`df`	Vector of degrees of freedom.
`mean`	Vector of location/mean values.
`scale`	Vector of scale values.
`log, log.p`	Logical; If `TRUE`, values are returned on the log scale.
`lower.tail`	Logical; If `TRUE` (default), return P(X <= x). Else, return P(X > x) .
`p`	Vector of probabilities.
`n`	Number of samples to draw from the distribution.

See Also

`TDist`

windshieldy1 *windshieldy1*

Description

windshieldy1 data set. The data represents a sample of windshields whose hardness has been measured.

Usage

```
windshieldy1
```

Format

A vector with 9 elements

windshieldy2 *windshieldy2*

Description

windshieldy2 data set. The data represents a sample of windshields whose hardness has been measured.

Usage

```
windshieldy2
```

Format

A vector with 13 elements

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