

Package ‘conjBayes’

November 16, 2022

Title The R Package Offers `` Functions for updating conjugate priors for Bayesian analysis".

Version 1.0.0

Description The package `**conjBayes**` is an R package. The conjBayes packages provides functions for updating conjugate Bayesian prior distributions to the posterior distribution.

License GPL (>= 3)

Encoding UTF-8

LazyData true

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.1

Imports colorspace,
ggplot2

Suggests rmarkdown,
knitr,
tidyverse,
testthat (>= 3.0.0)

VignetteBuilder knitr

Config/testthat/edition 3

R topics documented:

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| | |
|---------------|---|
| BetaBernoulli | <i>Calculates conjugate Beta posterior from Beta prior and Bernoulli data</i> |
|---------------|---|

Description

Calculates conjugate Beta posterior from Beta prior and Bernoulli data

Usage

```
BetaBernoulli(y = numeric(), a0 = 0.5, b0 = 0.5)
```

Arguments

y A vector of binary (0 or 1) data, can be empty.

a0 A positive number, the Beta prior first shape parameter.

b0 A positive number, the Beta prior second shape parameter.

Value

out A list with element a1 and b1, the shape parameters for the posterior Beta distribution.

Examples

```
BetaBernoulli(y = numeric(), a0 = 0.5, b0 = 0.5)
BetaBernoulli(y = c(1,1,1,0,0), a0 = 0.5, b0 = 0.5)
```

| | |
|--------------|--|
| BetaBinomial | <i>Calculates conjugate Beta posterior from Beta prior and Binomial data</i> |
|--------------|--|

Description

Calculates conjugate Beta posterior from Beta prior and Binomial data

Usage

```
BetaBinomial(y = numeric(), n = 10, a0 = 0.5, b0 = 0.5)
```

Arguments

y An integer data value, the number of successes in n iid Bernoulli trials. Can be empty.

n

a0 A positive number, the Beta prior first shape parameter.

b0 A positive number, the Beta prior second shape parameter.

Value

out A list with element a1 and b1, the shape parameters for the posterior Beta distribution.

Examples

```
BetaBernoulli(y = numeric(), n=100, a0 = 0.5, b0 = 0.5)
BetaBernoulli(y = 4, n=10 a0 = 0.5, b0 = 0.5)
```

| | |
|------------------|---|
| GammaExponential | <i>Calculates conjugate Gamma posterior from Gamma prior and Exponential data</i> |
|------------------|---|

Description

Calculates conjugate Gamma posterior from Gamma prior and Exponential data

Usage

```
GammaExponential(y = numeric(), a0 = 2, b0 = 1)
```

Arguments

| | |
|----|---|
| y | A vector of positive numeric data values, can be empty. |
| a0 | A positive number, the Gamma prior shape parameter. |
| b0 | A positive number, the Gamma prior rate parameter (=1/scale parameter). |

Value

out A list with element a1 and b1, the shape parameters for the posterior Gamma distribution.

Examples

```
GammaExponential(y = numeric(), a0 = 2, b0 = 1)
GammaExponential(y = c(1.215, 3.915, 2.519, 2.593, 6.924), a0 = 2, b0 = 1.0)
```

| | |
|--------------|---|
| GammaPoisson | <i>Calculates conjugate Gamma posterior from Gamma prior and Poisson data</i> |
|--------------|---|

Description

Calculates conjugate Gamma posterior from Gamma prior and Poisson data

Usage

```
GammaPoisson(y = numeric(), a0 = 2, b0 = 1)
```

Arguments

| | |
|----|---|
| y | A vector of non-negative integer count data, can be empty. |
| a0 | A positive number, the Gamma prior shape parameter. |
| b0 | A positive number, the Gamma prior rate parameter (=1/scale parameter). |

Value

out A list with element a1 and b1, the shape parameters for the posterior Gamma distribution.

Examples

```
GammaPoisson(y = numeric(), a0 = 2, b0 = 1)
GammaPoisson(y = c(1, 3, 5, 6, 5), a0 = 2, b0 = 1.0)
```

| | |
|-----------|--------------|
| NIGNormal | <i>Title</i> |
|-----------|--------------|

Description

Title

Usage

```
NIGNormal(y = numeric(), mu0 = 0, B0 = 1, a0 = 3, d0 = 1)
```

Arguments

d0

| | |
|--------------|--|
| NormalNormal | <i>Calculates conjugate Normal posterior from Normal prior and Normal data</i> |
|--------------|--|

Description

Calculates conjugate Normal posterior from Normal prior and Normal data

Usage

```
NormalNormal(y = numeric(), mu0 = 0, tau0 = 1, sigma = 1)
```

Arguments

| | |
|-------|--|
| y | A vector of numeric data, can be empty. |
| mu0 | A real number, the Normal prior mean parameter. |
| tau0 | A positive number, the Normal prior standard (std) deviation parameter. |
| sigma | A positive number, std deviation of the Normal data distribution, assumed known. |

Value

out A list with element mu1 and tau1, the mean and std deviation parameters for the posterior Normal distribution.

Examples

```
NormalNormal(y = numeric(), mu0 = 2, tau0 = 1, sigma = 2)
NormalNormal(y = c(-1.807, 1.043, -1.700, 2.446, 2.367), mu0 = 1, tau0 = 1, sigma = 2)
```