

Package ‘tlnise’

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Depends R (>= 3.0.0)

Suggests MASS

Imports stats

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Title Two-level normal independent sampling estimation

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Description Functions for two level normal models as described in
Everson and Morris (2000). J. R. Statist. Soc. B, 62 prt 2,pp.399--412.

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URL <http://www.swarthmore.edu/NatSci/peverso1/TLNise/tlnise.htm>

NeedsCompilation yes

Repository CRAN

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*TLNise***Description**

Two level Normal independent sampling estimation

Usage

```
tlnise(Y, V, w = NA, V0 = NA, prior = NA, N = 1000, seed = NULL,
      Tol = 1e-06, maxiter = 1000, intercept = TRUE, labelY = NA,
      labelYj = NA, labelw = NA, digits = 4, brief = 1, prnt = TRUE)
```

Arguments

Y	Jxp (or pxJ) matrix of p-dimensional Normal outcomes
V	pxpxJ array of pxp Level-1 covariances (assumed known)
w	Jxq (or qxJ) covariate matrix (adds column of 1's if not included and intercept = TRUE)
V0	"typical" Vj (default is average of Vj's)
prior	prior parameter (see Details)
N	number of Constrained Wishart draws for inference
seed	seed for the random number generator
Tol	tolerance for determining modal convergence
maxiter	maximum number of EM iterations for finding mode
intercept	if TRUE, an intercept term is included in the regression
labelY	optional names vector for the J observations
labelYj	optional names vector for the p elements of Yj
labelw	optional names vector for covariates
digits	number of significant digits for reporting results
brief	level of output, from 0 (minimum) to 2 (maximum)
prnt	controls printing during execution

Details

The prior is $p(B0) = |B0|^{(prior-p-1)/2}$.

Note that for the prior distribution, $prior = -(p+1)$ corresponds to a uniform on level-2 covariance matrix A (default), $prior = 0$ is the Jeffreys' prior, and $prior = (p+1)$ is the uniform prior on shrinkage matrix B0.

Value

tlnise returns a list, the precise contents of which depends on the value of the brief argument. Setting brief = 2 returns the maximum amount of information. Setting brief = 1 or brief = 0 returns a subset of that information.

If brief = 2, the a list with the following components is returned:

gamma	matrix of posterior mean and SD estimates of Gamma, and their ratios
theta	pxJ matrix of posterior mean estimates for thetj's
SDtheta	pxJ matrix of posterior SD estimates for thetj's
A	pxp estimated posterior mean of variance matrix A
rtA	p-vector of between group SD estimates
Dgamma	rxr estimated posterior covariance matrix for Gamma
Vtheta	pxpxJ array of estimated covariances for thetj's
B0	pxpxN array of simulated B0 values
lr	N-vector of log density ratios for each B0 value
lf	N-vector of log f(B0 Y) evaluated at each B0
lf0	N-vector of log f0(B0 Y) evaluated at each B0 (f0 is the CWish envelope density for f)
df	degrees of freedom for f0
Sigma	scale matrix for f0
nvec	number of matrices begun, diagonal and off-diagonal elements simulated to get N CWish matrices
nrej	number of rejections that occurred at each step 1,...,p

Author(s)

S-PLUS original by Philip Everson; R port by Roger D. Peng

References

Everson PJ, Morris CN (2000). "Inference for Multivariate Normal Hierarchical Models," Journal of the Royal Statistical Society, Series B, 62 (6) 399–412.

Examples

```
x <- rnorm(10) ## Second level
y <- rnorm(10, x) ## First level means

out <- tlnise(Y = y, V = rep(1, 10), w = rep(1, 10), seed = 1234)
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