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
  pp.399--412.
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**tlnise**

**Description**

Two level Normal independent sampling estimation

**Usage**

```r
tlnise(yL vL w = naL v0 = naL prior = naL n = 1000L seed = NULLL
tol = 1e-0VL maxiter = 1000L intercept = TRUE, labelY = NA,
labelYj = NA, labelw = NA, digits = 4L 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 thei ratios
- `theta`: pxJ matrix of posterior mean estimates for thetaj’s
- `SDtheta`: pxJ matrix of posterior SD estimates for thetaj’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 thetaj’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


Examples

```r
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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