bayeslm

Efficient sampling for Gaussian linear model with arbitrary priors

`https://cran.r-project.org/web/packages/bayeslm/bayeslm.pdf`

Description: This package implements an efficient sampler for Gaussian Bayesian linear regression. The package uses elliptical slice sampler instead of regular Gibbs sampler. The function has several built-in priors and user can also provide their own prior function (written as a R function).

Usage:

```
bayeslm(Y,X=FALSE, prior = "horseshoe", penalize = NULL,block_vec = NULL,
sigma = NULL, s2 = 1, kap2 = 1, N = 20000L, burnin = 0L,thinning = 1L,
vglobal = 1, sampling_vglobal = TRUE, verb = FALSE, icept = TRUE,
standardize = TRUE, singular = FALSE, scale_sigma_prior = TRUE,
prior_mean = NULL, prob_vec = NULL, cc = NULL, ...)
```

Main reference: Hahn, He and Lopes (2019) Efficient sampling for Gaussian linear regression with arbitrary priors. *Journal of Computational and Graphical Statistics*, 28, 142-154.

bayesreg

Fitting Bayesian Regression Models with Continuous Shrinkage Priors
https://cran.r-project.org/web/packages/bayesreg/bayesreg.pdf

Description: Fit a linear or logistic regression model using Bayesian continuous shrinkage prior distributions. Handles ridge, lasso, horseshoe and horseshoe+ regression with logistic, Gaussian, Laplace or Student-t distributed targets. See bayesreg-package for more details on the features available in this package.

Usage:

```
bayesreg(formula,data,model="normal",prior="ridge",
n.samples=1000,burnin=1000,thin=5,t.dof=5)
```

Main reference: Makalic and Schmidt (2016) High-Dimensional Bayesian Regularised Regression with the BayesReg Package. arXiv:1611.06649, https://arxiv.org/pdf/1611.06649.pdf

MCMCregress

Markov Chain Monte Carlo for Gaussian Linear Regression

https://cran.r-project.org/web/packages/MCMCpack/MCMCpack.pdf

Description: This function generates a sample from the posterior distribution of a linear regression model with Gaussian errors using Gibbs sampling (with a multivariate Gaussian prior on the beta vector, and an inverse Gamma prior on the conditional error variance). The user supplies data and priors, and a sample from the posterior distribution is returned as an mcmc object, which can be subsequently analyzed with functions provided in the coda package.

Usage:

```
MCMCregress(formula, data = NULL, burnin = 1000, mcmc = 10000,
thin = 1, verbose = 0, seed = NA, beta.start = NA,b0=0,B0=0,
c0 = 0.001, d0 = 0.001, sigma.mu = NA, sigma.var = NA,
marginal.likelihood = c("none", "Laplace", "Chib95"), ...)
```

Main reference: Martin, Quinn and Park (2011) MCMCpack: Markov Chain Monte Carlo in R. *Journal of Statistical Software*, 42(9), 1-21. http://www.jstatsoft.org/v42/i09.

runireg

IID Sampler for Univariate Regression

`https://cran.r-project.org/web/packages/bayesm/bayesm.pdf`

Description: runireg implements an iid sampler to draw from the posterior of a univariate regression with a conjugate prior.

Usage:

```
runireg(Data, Prior, Mcmc)
```

Arguments:

`Data`	list(y, X)
`Prior`	list(betabar, A, nu, ssq)
`Mcmc`	list(R, keep, nprint)

Main reference: Rossi, Allenby, and McCulloch (2005) *Bayesian Statistics and Marketing*. John Wiley and Sons.

bas.lm

Bayesian Adaptive Sampling for Bayesian Model Averaging and Variable Selection in Linear Models

https://cran.r-project.org/web/packages/BAS/BAS.pdf

Description: Sample without replacement from a posterior distribution on models

Usage:

```
bas.lm(formula,data,subset,weights,contrasts = NULL,na.action="na.omit",
n.models = NULL,prior = "ZS-null",alpha = NULL,
modelprior = beta.binomial(1, 1), initprobs="Uniform",include.always=~1,
method = "BAS", update = NULL, bestmodel = NULL, prob.local = 0,
prob.rw = 0.5, MCMC.iterations = NULL, lambda = NULL, delta = 0.025,
thin = 1, renormalize = FALSE, force.heredity = FALSE, pivot = TRUE,
tol = 1e-07,bigmem = FALSE)
```

Main reference: Clyde, Ghosh and Littman (2010) Bayesian Adaptive Sampling for Variable Selection and Model Averaging. *Journal of Computational Graphics and Statistics*, 20, 80-101. https://dx.doi.org/10.1198/jcgs.2010.09049