Package 'UnitLevelNonlin'

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Title Implements certain unit-level nonlinear models

Version 0.0.0.9000

Description Currently, this package implements small area prediction for a unit-level lognormal model. In future work, we will incorporate Poisson models and gamma models.

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Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.1.2

Imports lme4, stats

Suggests knitr, rmarkdown

VignetteBuilder knitr

R topics documented:

`unitLN` *Small area inference for the unit-level lognormal model*

Description

Small area inference for the unit-level lognormal model

Usage

```
unitLN(yspos, Xs, Xpop, areafacpop, areafacsamp, sampindex)
```

Arguments

yspos	a numeric vector with the positive (not log transformed) response variables
Xs	the matrix of covariates for sampled elements that does not contain an intercept
Xpop	the matrix of covariates for the full population that does not contain an intercept
areafacpop	a vector of area labels for the full population
areafacsamp	a vector of area samples for the full population
sampindex	the vector of sampled index values

Value

a list with predictions and MSE estimates

Examples

```
beta0 <- log(0.5)
beta1 <- 1
beta2 <- 2
D <- 60
Nis <- c(100, 200, 500)
Nis <- rep(Nis, each = D/length(Nis))
N <- sum(Nis)
x1 <- rnorm(N)
x2 <- rnorm(N)
areafacpop <- rep(1:D, Nis)
sigma2b <- 0.5
sigma2e <- 1
bi <- rnorm(D, mean = 0, sd = sqrt(sigma2b))
ei <- rnorm(N, mean = 0, sd = sqrt(sigma2e))
names(bi) <- as.character(1:D)
y <- exp(beta0 + beta1*x1 + beta2*x2 + bi[as.character(areafacpop)] + ei)
samplist <- sapply(1:D, function(i){sample( (1:N)[areafacpop == i],
size = 0.1*Nis[i], replace = FALSE)})
sampindex <- unlist(samplist)
areafacsamp <- areafacpop[sampindex]
ys <- y[sampindex]
Xpop <- cbind(x1, x2)
Xs <- Xpop[sampindex,]
popindex <- 1:N
unitLN(ys, Xs, Xpop,  areafacpop, areafacsamp, sampindex)
```

Index