Poisson

Parametrisation

The Poisson distribution is

$$\text{Prob}(y) = \frac{\lambda^y}{y!} \exp(-\lambda)$$

for responses $y = 0, 1, 2, \ldots$, where

λ: the expected value.

Link-function

The mean and variance of y are given as

$$\mu = \lambda \qquad \text{and} \qquad \sigma^2 = \lambda$$

and the mean is linked to the linear predictor by

$$\lambda(\eta) = E \exp(\eta)$$

where $E > 0$ is a known constant (or $\log(E)$ is the offset of η).

Hyperparameters

None.

Specification

- family = `poisson`
- Required arguments: y and E

Example

In the following example we estimate the parameters in a simulated example with Poisson responses.

```
n=100
a = 1
b = 1
z = rnorm(n)
eta = a + b*z
E = sample(1:10, n, replace=TRUE)
lambda = E*exp(eta)
y = rpois(n, lambda = lambda)

data = list(y=y,z=z)
formula = y ~ 1+z
result = inla(formula, family = "poisson", data = data, E=E)
summary(result)
```

Notes

None.