

Package: qbrms (via r-universe)

May 14, 2026

Title Quick Bayesian Regression Models Using 'INLA' with 'brms' Syntax

Version 1.0.1

Date 2025-11-26

Maintainer Tony Myers <admyers@aol.com>

Description Provides a 'brms'-like interface for fitting Bayesian regression models using 'INLA' (Integrated Nested Laplace Approximations) and 'TMB' (Template Model Builder). The package offers faster model fitting while maintaining familiar 'brms' syntax and output formats. Supports fixed and mixed effects models, multiple probability distributions, conditional effects plots, and posterior predictive checks with summary methods compatible with 'brms'. 'TMB' integration provides fast ordinal regression capabilities. Implements methods adapted from 'emmeans' for marginal means estimation and 'bayestestR' for Bayesian inference assessment. Methods are based on Rue et al. (2009) <[doi:10.1111/j.1467-9868.2008.00700.x](https://doi.org/10.1111/j.1467-9868.2008.00700.x)>, Kristensen et al. (2016) <[doi:10.18637/jss.v070.i05](https://doi.org/10.18637/jss.v070.i05)>, Lenth (2016) <[doi:10.18637/jss.v069.i01](https://doi.org/10.18637/jss.v069.i01)>, Bürkner (2017) <[doi:10.18637/jss.v080.i01](https://doi.org/10.18637/jss.v080.i01)>, Makowski et al. (2019) <[doi:10.21105/joss.01541](https://doi.org/10.21105/joss.01541)>, and Kruschke (2014, ISBN:9780124058880).

License MIT + file LICENSE

Encoding UTF-8

Language en-GB

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

Depends R (>= 4.0.0)

Imports methods, ggplot2, mvtnorm, cowplot, lme4, patchwork, posterior, scales, shiny, miniUI, future, future.apply, loo, TMB, jsonlite

Suggests testthat (>= 3.0.0), INLA, knitr, rmarkdown, DHARMA, MASS, ordinal, rstudioapi, emmeans, bayestestR, gridExtra, data.table, tibble, quantreg, readxl, haven

LinkingTo Rcpp, RcppEigen, TMB

Config/testthat/edition 3

URL <https://github.com/Tony-Myers/qbrms>

BugReports <https://github.com/Tony-Myers/qbrms/issues>

Additional_repositories <https://inla.r-inla-download.org/R/stable/>

VignetteBuilder knitr

Config/pak/sysreqs cmake make libuv1-dev zlib1g-dev

Repository <https://tony-myers.r-universe.dev>

Date/Publication 2025-12-04 00:05:52 UTC

RemoteUrl <https://github.com/tony-myers/qbrms>

RemoteRef HEAD

RemoteSha c02e90a61140dac2b578c1f8a3a9ef8898763c79

Contents

qbrms-package	5
asymmetric_laplace	6
bayes_R2	6
bayesfactor	7
Beta	8
beta_binomial	9
beta_prior	9
beta_variants	10
bf	10
binomial	11
c.qbrms_prior_spec	12
cauchy	12
check_convergence	13
circular_normal	13
coef.qbrms_fit	14
coef.qbrms_multinomial_fit	14
coef.tmb_ordinal_qbrms_fit	15
compare_models	15
compare_significance	16
conditional_effects	16
conditional_effects.qbrms_fit	17
conditional_effects.tmb_ordinal_qbrms_fit	18
conditional_effects_slices	19
convert_family_to_inla	20
create_dummy_data	20
create_prior_object	21
cumulative	22
default_priors	22

density_plot	23
diagnose_binomial_mixed	24
diagnose_model	24
drop_random_effects	26
emmeans	26
exponential	27
export_model	27
family_info	29
family_supports_quantile	29
fitted.qbrms_fit	30
fitted.tmb_ordinal_qbrms_fit	30
gamma	31
Gamma_family	31
gaussian	32
gen_student_t	32
get_default_prior	33
gev	33
hdi	34
hurdle_families	34
iid	35
import_model	35
kfold_cv	36
laplace	37
list_extended_families	38
lognormal	38
loo_compare	39
model_builder	39
model_lab_addin	40
model_workflow_addin	41
multinomial	41
neg_binomial	41
negbinomial	42
normal	42
p_direction	43
p_significance	43
plot.qbrms_conditional_effects	44
plot.qbrms_diagnostics	45
plot.qbrms_p_significance	45
plot_parameters	46
poisson	48
pp_check	48
pp_check.tmb_ordinal_qbrms_fit	49
print.qbrmb_fit	50
print.qbrms_diagnostics	50
print.qbrms_fit	51
print.qbrms_kfold	51
print.qbrms_loo_compare	52
print.qbrms_model_spec	52

print.qbrms_multinomial_fit	53
print.qbrms_p_significance	53
print.qbrms_prior_build	54
print.qbrms_prior_code	55
print.qbrms_prior_diagnostics	55
print.qbrms_prior_dist	56
print.qbrms_prior_list	56
print.qbrms_prior_spec	57
print.qbrmsformula	57
print.summary.qbrms_fit	58
print.tmb_ordinal_qbrms_fit	58
prior	59
prior_build_from_beliefs	59
prior_code	60
prior_pp_diagnostics	61
prior_pp_summary	62
prior_predictive_check	63
prior_to_posterior_workflow	64
priors	64
qbrm	65
qbrmb	66
qbrmb_aggressive	67
qbrmb_regularised	68
qbrmO	68
qbrms	69
qbrms-model-criteria	70
qbrms_bayesian_analysis	71
qbrms_binomial_regularised	71
qbrms_emmeans	72
qbrms_fit_log	73
qbrms_ordinal_binary	73
qbrms_set_verbosity	74
quick_density_comparison	74
random_walk_families	75
residuals.qbrms_fit	75
rope_analysis	76
simplex	76
skew_normal	77
student_t	77
summary.qbrmb_fit	79
summary.qbrms_fit	79
summary.qbrms_multinomial_fit	80
summary.qbrms_p_significance	81
summary.tmb_ordinal_qbrms_fit	81
tab_model	82
test_corrected_bayes_R2	83
uniform	84
validate_family_quantile	85

qbrms-package 5

<code>vcov.qbrms_fit</code>	85
<code>vcov.tmb_ordinal_qbrms_fit</code>	86
<code>view_table</code>	86
<code>visualise_prior</code>	87
<code>weibull</code>	88
<code>zero_inflated_negbinomial</code>	89
<code>zero_inflated_poisson</code>	89

Index 90

`qbrms`-package *qbrms: Quick Bayesian Regression Models using INLA*

Description

The `qbrms` package provides a `brms`-like interface for fitting Bayesian regression models using INLA (Integrated Nested Laplace Approximations). It offers faster model fitting while maintaining familiar `brms` syntax and output formats.

Details

The main function is `qbrms` which fits Bayesian models using INLA with `brms`-like syntax. The package supports:

- Fixed and mixed effects models
- Multiple probability distributions
- Conditional effects plots
- Posterior predictive checks
- Summary methods compatible with `brms`
- Interactive model building with `model_builder`
- RStudio add-in for point-and-click model specification

Author(s)

Tony Myers

See Also

Useful links:

- <https://github.com/Tony-Myers/qbrms>
- Report bugs at <https://github.com/Tony-Myers/qbrms/issues>

asymmetric_laplace	<i>Asymmetric Laplace for Quantile Regression</i>
--------------------	---

Description

Asymmetric Laplace for Quantile Regression

Usage

```
asymmetric_laplace()
```

Value

An object of class "family" representing the Asymmetric Laplace distribution.

bayes_R2	<i>Bayesian R-squared for qbrms Models</i>
----------	--

Description

Compute Bayesian R-squared values for qbrms regression models following the method of Gelman et al. (2019). This corrected version properly handles mixed-effects models to match brms output exactly.

Usage

```
bayes_R2(
  object,
  summary = TRUE,
  robust = FALSE,
  probs = c(0.025, 0.975),
  ndraws = 1000,
  newdata = NULL,
  verbose = TRUE
)
```

Arguments

object	A qbrms_fit object.
summary	Logical; if TRUE (default), return summary statistics. If FALSE, return the posterior draws.
robust	Logical; if TRUE, use robust summary statistics.
probs	Numeric vector of quantiles for summary (default: c(0.025, 0.975)).
ndraws	Number of posterior draws to use (default: 1000).
newdata	Optional data frame for predictions. If NULL, uses the original data.
verbose	Logical; print progress information.

Details

This implementation handles mixed-effects models by:

1. Using INLA's fitted values that include random effects when available
2. Correctly sampling random effects from their posterior distributions
3. Properly accounting for the variance decomposition in mixed models

Value

If `summary = TRUE`, a matrix with summary statistics. If `summary = FALSE`, a vector of R-squared values from posterior draws.

 bayesfactor

Bayesian Hypothesis Testing (very simple approximations)

Description

Compute a crude Bayes factor for a point, interval, or comparison hypothesis using approximate posterior draws recovered from a `qbrms_fit`. This is deliberately simple and intended for exploratory use.

Usage

```
bayesfactor(
  object,
  hypothesis,
  prior = NULL,
  null = 0,
  direction = "two-sided",
  rope = NULL,
  nsim = 4000,
  verbose = TRUE
)
```

Arguments

<code>object</code>	A <code>qbrms_fit</code> object.
<code>hypothesis</code>	Character string, for example "Intercept > 0", "b_x = 0", or "b_x > 0.2".
<code>prior</code>	Optional prior information (unused here, kept for API compatibility).
<code>null</code>	Numeric null value for point tests (default 0).
<code>direction</code>	One of "two-sided", "greater", "less" (kept for API compatibility).
<code>rope</code>	Optional numeric length-2 vector <code>c(lower, upper)</code> to define a ROPE for point tests.
<code>nsim</code>	Number of posterior draws to simulate from the fitted summary.
<code>verbose</code>	Logical; print progress information.

Value

An object of class `qbrms_bayesfactor`.

Beta

Beta Family Constructor (Capital B)

Description

Beta distribution family for response variables in (0,1)

Usage

```
Beta(link = "logit", link.phi = "log")
```

```
Beta(link = "logit", link.phi = "log")
```

Arguments

`link` Link function for the mean parameter (default: "logit")

`link.phi` Link function for precision parameter (default: "log")

Value

A family object of class "family".

A family object for use with `qbrms()`

Examples

```
## Not run:  
# Beta regression for proportions  
fit <- qbrms(proportion ~ predictor, data = data, family = Beta())  
  
## End(Not run)
```

beta_binomial	<i>Beta Binomial Family for Overdispersed Binary Data</i>
---------------	---

Description

Beta Binomial Family for Overdispersed Binary Data

Usage

```
beta_binomial(link = "logit")
```

Arguments

link	Link function for probability parameter (default: "logit")
------	--

Value

A family object of class "family".

beta_prior	<i>Specify Beta Prior Distribution</i>
------------	--

Description

Specify Beta Prior Distribution

Usage

```
beta_prior(alpha = 1, beta = 1)
```

Arguments

alpha	First shape parameter
beta	Second shape parameter

Value

A prior distribution object

beta_variants

*Alternative Beta Parameterizations***Description**

Alternative Beta Parameterizations

Usage

beta0(link = "logit")

beta1(link = "logit")

logitbeta(link = "logit")

Arguments

link Link function (default: "logit")

Value

A family object of class "family".

bf

*Create a Bayesian Formula***Description**

Function to set up a model formula for use in qbrms, allowing specification of distributional parameters (e.g., sigma) in addition to the mean structure.

Usage

bf(formula, ..., flist = NULL, family = NULL, nl = FALSE)

Arguments

formula	Main model formula (for the mean/location parameter).
...	Additional formulas for distributional parameters (e.g., sigma ~ x).
flist	Optional list of formulas (for internal use).
family	Same as in qbrms() (optional here).
nl	Logical; indicating if the model is non-linear (not yet fully supported).

Details

This function mimics the `brms::bf()` syntax to allow users familiar with `brms` to define distributional models.

Supported distributional parameters depend on the family:

- gaussian: `sigma` (residual standard deviation)
- student_t: `sigma`, `nu` (degrees of freedom)
- lognormal: `sigma` (shape parameter)
- beta: `phi` (precision)
- simplex: `phi` (precision)

Value

An object of class `brmsformula` (and `qbrmsformula`) containing the parsed formulas.

Examples

```
## Not run:  
# Standard model  
f1 <- bf(y ~ x)  
  
# Distributional model (heteroscedasticity)  
# Sigma varies by group  
f2 <- bf(y ~ x, sigma ~ group)  
  
## End(Not run)
```

binomial

Binomial Family

Description

Binomial Family

Usage

```
binomial()
```

Value

An object of class "family" representing the Binomial distribution.

`c.qbrms_prior_spec` *Combine Multiple Prior Specifications*

Description

Combine Multiple Prior Specifications

Usage

```
## S3 method for class 'qbrms_prior_spec'  
c(...)
```

Arguments

... Prior specification objects created by prior()

Value

A combined prior object

`cauchy` *Specify Cauchy Prior Distribution*

Description

Specify Cauchy Prior Distribution

Usage

```
cauchy(location = 0, scale = 1)
```

Arguments

location Location parameter (default 0)
scale Scale parameter (default 1)

Value

A prior distribution object

check_convergence	<i>Quick model diagnostics</i>
-------------------	--------------------------------

Description

Quick model diagnostics

Usage

```
check_convergence(object)
```

Arguments

object A qbrms_fit object.

Value

Invisible TRUE if successful.

circular_normal	<i>Circular Normal Family for Directional Data</i>
-----------------	--

Description

Circular Normal Family for Directional Data

Usage

```
circular_normal(link = "tan_half", link.kappa = "log")
```

```
von_mises(link = "tan_half", link.kappa = "log")
```

Arguments

link Link function for mean direction

link.kappa Link function for concentration

Value

A family object of class "family".

coef.qbrms_fit	<i>Extract Coefficients from qbrms Models</i>
----------------	---

Description

Extract Coefficients from qbrms Models

Usage

```
## S3 method for class 'qbrms_fit'
coef(object, ...)
```

Arguments

object	A qbrms_fit object
...	Additional arguments (unused)

Value

Named vector of coefficients

coef.qbrms_multinomial_fit	<i>Coefficients for multinomial qbrms fits</i>
----------------------------	--

Description

Extract a concatenated vector of coefficients from a qbrms_multinomial_fit, combining the per-category binary submodels if present.

Usage

```
## S3 method for class 'qbrms_multinomial_fit'
coef(object, ...)
```

Arguments

object	A qbrms_multinomial_fit.
...	Unused.

Value

A named numeric vector of coefficients. If coefficient information is not available, a minimal intercept-only vector is returned.

 coef.tmb_ordinal_qbrms_fit

Coefficients Method for TMB Ordinal Fits

Description

Coefficients Method for TMB Ordinal Fits

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
coef(object, ...)
```

Arguments

object	A tmb_ordinal_qbrms_fit object
...	Additional arguments

Value

Named vector of coefficients

 compare_models

Compare qbrms models

Description

Compares multiple fitted models using information criteria and simple predictive metrics. Preference order for criterion = "auto" is: LOO (from CPO) > WAIC > DIC. When information criteria are unavailable it falls back to predictive metrics (RMSE/MAE).

Usage

```
compare_models(
  ...,
  criterion = c("auto", "loo", "waic", "dic", "all"),
  compare_predictions = TRUE,
  weights = TRUE
)
```

Arguments

...	Two or more fitted model objects (qbrms_fit or qbrmO_fit)
criterion	One of "auto", "loo", "waic", "dic", "all"
compare_predictions	Logical; if TRUE, include RMSE/MAE comparison
weights	Logical; if TRUE, compute weights when a single criterion is used

Value

An object of class "qbrms_comparison".

compare_significance *Compare Significance Across Multiple Models*

Description

Compare the probability of practical significance for parameters across multiple qbrms models.

Usage

```
compare_significance(
  ...,
  parameters = NULL,
  threshold = "default",
  model_names = NULL
)
```

Arguments

...	qbrms_fit objects to compare
parameters	Character vector of parameters to compare
threshold	Threshold specification (same as p_significance)
model_names	Character vector of model names

Value

Data frame with comparison results

conditional_effects *Conditional effects (generic)*

Description

Compute one-dimensional conditional effects / marginal fitted values as a predictor varies while other covariates are held fixed (typically at means / modes). Methods should return an object that plot() can visualise.

Usage

```
conditional_effects(object, ...)
```

Arguments

object	A model object.
...	Passed to methods.

Value

An object of class "qbrms_conditional_effects" containing conditional effect estimates. The structure is method-dependent.

conditional_effects.qbrms_fit
Conditional effects for qbrms Gaussian models

Description

Conditional effects for qbrms Gaussian models

Usage

```
## S3 method for class 'qbrms_fit'
conditional_effects(
  object,
  effects = NULL,
  spaghetti = FALSE,
  ndraws = 200L,
  n_points = 100L,
  at = list(),
  seed = NULL,
  prob = 0.95,
  ...
)
```

Arguments

object	A qbrms fit object (Gaussian).
effects	Character vector: names of predictors to vary. Supports simple two-way interactions "num:fac" or "fac:num" where one is numeric and the other factor.
spaghetti	Logical; if TRUE draw per-draw "spaghetti" lines. If FALSE, draw a mean line with a credible-interval ribbon.
ndraws	Number of joint coefficient draws for uncertainty (default 200).
n_points	Size of the x-grid across the observed range (default 100).
at	Optional named list of covariate values to hold constant.
seed	Optional integer seed for reproducibility.
prob	Interval probability for ribbons (default 0.95).
...	Ignored.

Value

An object of class "qbrms_conditional_effects" containing a list with one element per effect. Each element is a data frame with columns for the predictor values, point estimates (estimate__), and credible interval bounds (lower__, upper__).

```
conditional_effects.tmb_ordinal_qbrms_fit
```

Conditional Effects for TMB Ordinal Models

Description

Conditional Effects for TMB Ordinal Models

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
conditional_effects(
  object,
  effects = NULL,
  prob = 0.95,
  ndraws = 100,
  spaghetti = FALSE,
  n_points = 100,
  plot = TRUE,
  at = list(),
  seed = NULL,
  conditions = NULL,
  categorical = TRUE,
  resolution = NULL,
  ...
)
```

Arguments

object	A tmb_ordinal_qbrms_fit object
effects	Character vector of effect names (defaults to auto-detected)
prob	Confidence level
ndraws	Number of draws
spaghetti	Logical
n_points	Number of points for continuous predictors
plot	Logical, whether to return plots
at	Named list of conditioning values
seed	Random seed
conditions	Ordinal-specific conditions (for backwards compatibility)

categorical	Whether to show categorical plot (for backwards compatibility)
resolution	Grid resolution (for backwards compatibility)
...	Additional arguments

Value

List of conditional effects

conditional_effects_slices

Discrete-slice conditional effects (brms-style) for qbrms

Description

Build point/interval summaries at a few values of a numeric moderator, plotted against the factor on the x-axis.

Usage

```
conditional_effects_slices(
  object,
  effects,
  slices = NULL,
  nslices = 3L,
  prob = 0.95,
  ndraws = 200L,
  at = list(),
  seed = NULL,
  ...
)
```

Arguments

object	A qbrms_fit object.
effects	Character vector specifying effects to plot. If NULL, all numeric predictors are used.
slices	Named list of variables and values at which to slice the data.
nslices	Number of slices to use for each slicing variable.
prob	Probability mass to include in uncertainty intervals (default 0.95).
ndraws	Number of posterior draws to use for predictions.
at	Named list of values at which to fix other predictors.
seed	Random seed for reproducibility.
...	Additional arguments passed to prediction functions.

Value

An object of class "qbrms_conditional_effects" containing a list with one element per effect. Each element is a data frame with columns for the predictor values, estimates, and credible intervals.

```
convert_family_to_inla
```

Convert Family Object to INLA-Compatible Specification

Description

Enhanced family conversion supporting all standard and additional families with automatic routing to specialised implementations when enabled.

Usage

```
convert_family_to_inla(family, quantile = 0.5, allow_ordinal_routing = FALSE)
```

Arguments

family A family object, character string, or list specifying the response distribution
 quantile Numeric value between 0 and 1 for quantile regression
 allow_ordinal_routing Logical; if TRUE, enables routing for ordinal families

Value

Character string, list, or routing object specifying family/routing info

```
create_dummy_data
```

Create Dummy Data for Testing

Description

Create dummy data that preserves structure for testing purposes.

Usage

```
create_dummy_data(  
  formula,  
  data,  
  n_dummy = 10,  
  family_name = "gaussian",  
  verbose = FALSE  
)
```

Arguments

formula	Model formula.
data	Original data frame.
n_dummy	Number of dummy observations to create.
family_name	The name of the model family (e.g., "gaussian").
verbose	Logical, whether to print messages.

Value

Data frame with dummy structure.

create_prior_object *Create Prior-Only Object for pp_check*

Description

Construct a small qbrms_prior_only object that contains simulated data and prior draws, suitable for passing to pp_check().

Usage

```
create_prior_object(
  formula,
  family = gaussian(),
  prior = NULL,
  n_obs = 100,
  predictor_values = NULL,
  verbose = TRUE
)
```

Arguments

formula	Model formula.
family	Model family (default gaussian()).
prior	Prior specifications (default NULL uses defaults).
n_obs	Number of observations to simulate (default 100).
predictor_values	Named list of fixed predictor values (default NULL).
verbose	Logical; print progress messages (default TRUE).

Value

An object of class qbrms_prior_only.

cumulative	<i>Cumulative Family for Ordinal Regression</i>
------------	---

Description

Cumulative Family for Ordinal Regression

Usage

```
cumulative(link = "logit")
```

Arguments

link Link function (default: "logit").

Value

An object of class "family" representing the Cumulative distribution for ordinal models.

default_priors	<i>Default Priors for qbrms Models</i>
----------------	--

Description

Default Priors for qbrms Models

Usage

```
default_priors()
```

Value

A default prior list

`density_plot`*Density Plot for qbrms Models*

Description

Create density plots of posterior distributions with optional prior and observed-data overlays. Returns a ggplot2 object that can be modified with standard ggplot2 syntax.

Usage

```
density_plot(  
  object,  
  parameter = NULL,  
  show_prior = FALSE,  
  show_data = FALSE,  
  ndraws = 100,  
  prior_ndraws = 100,  
  alpha_levels = list(posterior = 0.8, prior = 0.6, data = 1),  
  colours = list(posterior = "#1F78B4", prior = "#E31A1C", data = "#000000"),  
  seed = NULL,  
  verbose = TRUE  
)
```

Arguments

<code>object</code>	A <code>qbrms_fit</code> object.
<code>parameter</code>	Parameter name to plot. If <code>NULL</code> , plots the response distribution.
<code>show_prior</code>	Logical; if <code>TRUE</code> , overlay the prior density.
<code>show_data</code>	Logical; if <code>TRUE</code> , overlay the observed data density.
<code>ndraws</code>	Number of posterior draws to use (default 100).
<code>prior_ndraws</code>	Number of prior draws to use (default 100).
<code>alpha_levels</code>	Named list controlling transparency for layers.
<code>colours</code>	Named list of colours for layers.
<code>seed</code>	Optional random seed.
<code>verbose</code>	Logical; print progress messages.

Value

A ggplot2 object.

 diagnose_binomial_mixed

Diagnose Binomial Mixed Effects Models

Description

Diagnose potential issues in binomial mixed effects models before fitting

Usage

```
diagnose_binomial_mixed(formula, data, verbose = TRUE)
```

Arguments

formula	Model formula with mixed effects
data	Data frame containing variables
verbose	Logical; print diagnostic information (default: TRUE)

Value

List with diagnostic information

 diagnose_model

Automated Model Diagnostics and Recommendations

Description

Comprehensive automated diagnostics for qbrms models with actionable recommendations for model improvement.

Usage

```
diagnose_model(model, checks = "all", verbose = TRUE)
```

Arguments

model	A fitted qbrms model object
checks	Character vector specifying which checks to perform. Options: "all" (default), "convergence", "fit", "residuals", "posterior", "influential"
verbose	Logical; if TRUE, prints detailed diagnostic information (default: TRUE)

Details

This function performs comprehensive model diagnostics including:

- Convergence checks (for MCMC-based inference)
- Goodness-of-fit assessment
- Residual analysis
- Posterior predictive checks
- Influential observation detection
- Prior-posterior overlap assessment

Each check produces a pass/warning/fail status with specific recommendations for addressing any issues detected.

Value

An object of class "qbrms_diagnostics" containing:

- `summary`: Overall assessment (pass/warning/fail)
- `checks`: Detailed results for each diagnostic check
- `recommendations`: Specific suggestions for improvement
- `plots`: List of diagnostic plots

Examples

```
## Not run:  
# Fit a model  
fit <- qbrms(mpg ~ hp + wt, data = mtcars, family = gaussian())  
  
# Run diagnostics  
diag <- diagnose_model(fit)  
  
# View summary  
print(diag)  
  
# View specific recommendations  
diag$recommendations  
  
# Create diagnostic plots  
plot(diag)  
  
## End(Not run)
```

drop_random_effects	<i>Drop Random Effects from Formula</i>
---------------------	---

Description

Remove random effects terms from a model formula.

Usage

```
drop_random_effects(formula)
```

Arguments

formula A model formula that may contain random effects.

Value

Formula with random effects terms removed.

emmeans	<i>Estimated marginal means (compatibility wrapper)</i>
---------	---

Description

This wrapper lets you call `emmeans()` on a `qbrms_fit` without attaching the external **emmeans** package. For non-`qbrms_fit` objects, it forwards to **emmeans** if that package is installed.

Usage

```
emmeans(object, specs, ...)
```

Arguments

object A model object; if it is a `qbrms_fit` we dispatch to `qbrms_emmeans()`.
 specs Term(s) for which to compute estimated marginal means. For `qbrms_fit`, this is passed to `qbrms_emmeans()` unchanged.
 ... Additional arguments forwarded either to `qbrms_emmeans()` or to `emmeans::emmeans()` as appropriate.

Value

A data frame for `qbrms_fit`; otherwise whatever `emmeans::emmeans()` returns.

exponential	<i>Exponential Distribution (Prior or Family)</i>
-------------	---

Description

Exponential Distribution (Prior or Family)

Usage

```
exponential(rate_or_link = "log", link = NULL, ...)
```

```
prior_exponential(rate_or_link = 1)
```

Arguments

rate_or_link Rate parameter (numeric) or link function (character).

link Optional link function (if acting as family).

... Additional arguments.

Value

A family object or prior object depending on inputs.

export_model	<i>Export Model Specification</i>
--------------	-----------------------------------

Description

Export model specifications to various formats for sharing, documentation, or reproduction.

Usage

```
export_model(  
  model,  
  file,  
  format = c("R", "markdown", "text", "json"),  
  include_data = TRUE,  
  include_diagnostics = FALSE  
)
```

Arguments

model	A fitted qbrms model object or qbrms_model_spec object
file	Character string specifying output file path
format	Character string specifying export format: "R" (R script), "markdown" (Rmd document), "text" (plain text), or "json" (JSON format)
include_data	Logical; if TRUE, includes data summary in export (default: TRUE)
include_diagnostics	Logical; if TRUE and model is fitted, includes diagnostic information (default: FALSE)

Details

This function facilitates model sharing and documentation by exporting:

- Model formula and family specification
- Prior specifications (if any)
- Data summary and structure
- Model fitting code
- Results summary (for fitted models)
- Diagnostic information (if requested)

The exported content can be used to:

- Share analyses with collaborators
- Document modelling decisions
- Create reproducible research reports
- Archive model specifications

Value

Invisibly returns the export content as a character string

Examples

```
## Not run:
# Export model specification
spec <- model_builder(data = mtcars, response = "mpg")
export_model(spec, "my_model_spec.R", format = "R")

# Export fitted model
fit <- qbrms(mpg ~ hp + wt, data = mtcars, family = gaussian())
export_model(fit, "my_model.Rmd", format = "markdown",
             include_diagnostics = TRUE)

# Export as JSON
export_model(spec, "my_model.json", format = "json")

## End(Not run)
```

`family_info`*Get Family Documentation*

Description

Get Family Documentation

Usage

```
family_info(family_name)
```

Arguments

`family_name` Name of the family

Value

Character string with family information

`family_supports_quantile`*Check if Family Supports Quantile Regression*

Description

Determine whether a given family supports quantile regression.

Usage

```
family_supports_quantile(family_obj)
```

Arguments

`family_obj` Family object or name.

Value

Logical indicating whether the family supports quantile regression.

fitted.qbrms_fit *Extract fitted values from qbrms models*

Description

Extract fitted values from qbrms models

Usage

```
## S3 method for class 'qbrms_fit'
fitted(object, ...)
```

Arguments

object A qbrms_fit object
 ... Additional arguments (currently unused)

Value

Numeric vector of fitted values

Examples

```
## Not run:
fit <- qbrms(mpg ~ hp, data = mtcars, family = gaussian())
fitted_values <- fitted(fit)

## End(Not run)
```

fitted.tmb_ordinal_qbrms_fit
Fitted Values Method for TMB Ordinal Fits

Description

Fitted Values Method for TMB Ordinal Fits

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
fitted(object, ...)
```

Arguments

object A tmb_ordinal_qbrms_fit object
 ... Additional arguments

Value

Fitted values

gamma	<i>Gamma Distribution (Prior or Family)</i>
-------	---

Description

Gamma Distribution (Prior or Family)

Usage

```
gamma(shape_or_link = "log", rate = 1, link = NULL, ...)
```

```
gamma_prior(shape_or_link = 2, rate = 1)
```

Arguments

shape_or_link	Shape parameter (numeric) or link function (character).
rate	Rate parameter.
link	Optional link function (if acting as family).
...	Additional arguments.

Value

A family object or prior object depending on inputs.

Gamma_family	<i>Gamma family (GLM-style)</i>
--------------	---------------------------------

Description

Gamma family constructor to avoid conflict with base::gamma.

Usage

```
Gamma(link = "log")
```

Arguments

link	Link function (default: "log")
------	--------------------------------

Value

A family object of class "family".

gaussian	<i>Gaussian Family</i>
----------	------------------------

Description

Gaussian Family

Usage

```
gaussian()
```

Value

An object of class "family" representing the Gaussian distribution.

gen_student_t	<i>Generalized t Family</i>
---------------	-----------------------------

Description

Generalized t Family

Usage

```
gen_student_t(link = "identity", link.sigma = "log", link.nu = "log")
```

Arguments

link	Link function for location
link.sigma	Link function for scale
link.nu	Link function for degrees of freedom

Value

A family object of class "family".

get_default_prior *Get Default Prior for Parameter Class*

Description

Get Default Prior for Parameter Class

Usage

```
get_default_prior(class)
```

Arguments

class Parameter class

Value

A default prior for that class

gev *Generalized Extreme Value Family*

Description

Generalized Extreme Value Family

Usage

```
gev(link = "identity", link.sigma = "log", link.xi = "identity")
```

```
gumbel(link = "identity", link.sigma = "log")
```

Arguments

link Link function for location

link.sigma Link function for scale

link.xi Link function for shape

Value

A family object of class "family".

hdi	<i>Highest Density Interval (HDI)</i>
-----	---------------------------------------

Description

Compute highest density intervals for parameters based on simulated posterior draws from a `qbrms_fit`.

Usage

```
hdi(object, parameters = NULL, prob = 0.95, nsim = 4000)
```

Arguments

object	A <code>qbrms_fit</code> .
parameters	Optional character vector; default uses all fixed effects.
prob	Probability mass for the interval (default 0.95).
nsim	Number of draws to simulate.

Value

A data frame of class `qbrms_hdi`.

hurdle_families	<i>Hurdle Families for Two-Part Models</i>
-----------------	--

Description

Hurdle Families for Two-Part Models

Usage

```
hurdle_poisson(link = "log", link.hu = "logit")
```

```
hurdle_negbinomial(link = "log", link.hu = "logit")
```

Arguments

link	Link function for count component
link.hu	Link function for hurdle component

Value

A family object of class "family".

iid	<i>IID Random Effects</i>
-----	---------------------------

Description

IID Random Effects

Usage

```
iid(scale.model = "log", diagonal = 1e-06)
```

Arguments

scale.model	Scaling model for precision
diagonal	Diagonal precision matrix structure

Value

A family object of class "family".

import_model	<i>Import Model Specification from JSON</i>
--------------	---

Description

Import a previously exported model specification from JSON format.

Usage

```
import_model(file)
```

Arguments

file	Character string specifying JSON file path
------	--

Value

A list containing the model specification components

Examples

```
## Not run:
# Import model
spec <- import_model("my_model.json")

# Recreate model
fit <- qbrms(
  formula = as.formula(spec$model$formula),
  data = my_data,
  family = get(spec$model$family)()
)

## End(Not run)
```

kfold_cv

K-fold cross-validation for qbrms models (ordinal and standard families)

Description

Performs K-fold cross-validation either from a fitted model or from formula + data. For **ordinal (cumulative/ordinal)** families, you can choose the re-fit engine used inside CV: TMB (qbrm0) or a robust fallback using MASS: :polr that avoids TMB compilation in each fold. Your original fitted model is unchanged.

Usage

```
kfold_cv(
  object,
  data = NULL,
  family = gaussian(),
  K = 10,
  folds = NULL,
  seed = NULL,
  stratify = TRUE,
  parallel = FALSE,
  workers = NULL,
  keep_fits = FALSE,
  engine = c("auto", "tmb", "polr"),
  verbose = TRUE,
  ...
)
```

Arguments

object Either a fitted qbrms/qbrmO object **or** a formula.

data	Required only if object is a formula. Ignored if object is a fit.
family	Optional family override (used if object is a formula; fits use their own).
K	Number of folds (default 10).
folds	Optional integer vector of length <code>nrow(data)</code> giving fold IDs.
seed	Optional seed for stratified folds.
stratify	Logical; stratify on response if factor/ordered (default TRUE).
parallel	Logical; use <code>future.apply</code> if available (default FALSE).
workers	Optional workers when parallel and no plan is set.
keep_fits	Logical; keep per-fold fits (default FALSE).
engine	Ordinal CV engine: "auto" (default), "tmb", or "polr". Only used for ordinal families during CV refits. "auto" uses <code>getOption("qbrms.kfold.ordinal_engine", "polr")</code> .
verbose	Logical; brief progress (default TRUE).
...	Passed to <code>qbrms()</code> when refitting folds (non-ordinal or <code>engine="tmb"</code>).

Value

An object of class `qbrms_kfold` with ELPD, pointwise elpd, SE, etc.

laplace	<i>Laplace (Double Exponential) Family</i>
---------	--

Description

Laplace (Double Exponential) Family

Usage

```
laplace(link = "identity", link.sigma = "log")
```

```
double_exponential(link = "identity", link.sigma = "log")
```

Arguments

link	Link function for location
link.sigma	Link function for scale

Value

A family object of class "family".

```
list_extended_families
```

List Available Extended Families

Description

List Available Extended Families

Usage

```
list_extended_families()
```

Value

Data frame with family names, categories, and brief descriptions

```
lognormal
```

Lognormal Family Constructor

Description

Lognormal distribution family for positive continuous responses

Usage

```
lognormal(meanlog_or_link = "identity", sdlog = 1, link = NULL, ...)
```

```
lognormal(meanlog_or_link = "identity", sdlog = 1, link = NULL, ...)
```

```
lognormal_prior(meanlog_or_link = 0, sdlog = 1)
```

Arguments

meanlog_or_link	Mean on log scale (numeric) or link function (character).
sdlog	SD on log scale (numeric).
link	Optional link function (if acting as family).
...	Additional arguments.

Value

A family object for use with `qbrms()`

A family object or prior object depending on inputs.

Examples

```
## Not run:
# Lognormal regression
fit <- qbrms(response ~ predictor, data = data, family = lognormal())

## End(Not run)
```

 loo_compare

Compare models by LOO (default) or WAIC

Description

Compare multiple fitted models and rank them by out-of-sample fit. If you pass qbrms/qbrmO fit objects, this uses the package's loo() / waic() wrappers under the hood. If you pass actual loo objects (from the **loo** package), it will delegate to loo::loo_compare() automatically.

Usage

```
loo_compare(..., criterion = c("loo", "waic"), sort = TRUE)
```

Arguments

...	One or more fitted models (qbrms/qbrmO), or loo objects; you can also pass a single named list of models.
criterion	Character, "loo" (default) or "waic".
sort	Logical; if TRUE (default) the best model is first.

Value

A data.frame with model names, estimate on the ELPD scale (higher is better), standard error (if available), differences vs best, and ranks.

 model_builder

Interactive Model Builder for qbrms (console)

Description

An interactive assistant that guides users through model specification by asking questions about their data, suggesting appropriate families, helping with prior selection, and building qbrms model code.

Usage

```
model_builder(data = NULL, response = NULL, predictors = NULL, quiet = FALSE)
```

Arguments

data	A data frame containing the variables to be modelled (optional). If not provided, the user will be prompted to specify it.
response	Character string specifying the response variable name (optional).
predictors	Character vector of predictor variable names (optional).
quiet	Logical; if TRUE, suppresses welcome messages (default: FALSE).

Value

An object with class "qbrms_model_spec" containing:

- formula: The model formula
- family: A list with name and the constructed family object
- prior: Prior specifications (if provided)
- data: The data frame
- data_name: The symbol used for data in the emitted code
- model_code: Character string with executable qbrms code
- response_info: Summary information about the response

Examples

```
## Not run:
spec <- model_builder()
fit <- eval(parse(text = spec$model_code))

## End(Not run)
```

model_lab_addin

qbrms Model Lab (RStudio Add-in)

Description

Compare plausible families, run prior/posterior checks, plot conditional effects, compute diagnostics, and emit reproducible code. Does not load 'brms'.

Usage

```
model_lab_addin()
```

Value

This function is called for its side effects (launching a Shiny gadget in RStudio). It returns NULL invisibly.

model_workflow_addin *Launch Guided Bayesian Workflow (RStudio Add-in)*

Description

A comprehensive, step-by-step assistant for Bayesian model building with qbrms.

Usage

```
model_workflow_addin()
```

Value

No return value. This function launches an interactive Shiny gadget for model building and code generation.

multinomial *Multinomial Family*

Description

Multinomial Family

Usage

```
multinomial()
```

Value

An object of class "family" representing the Multinomial distribution.

neg_binomial *Negative Binomial Family*

Description

Negative Binomial Family

Usage

```
neg_binomial()
```

Value

An object of class "family" representing the Negative Binomial distribution.

negbinomial	<i>Negative Binomial Family (Alias)</i>
-------------	---

Description

Negative Binomial Family (Alias)

Usage

```
negbinomial()
```

Value

An object of class "family" representing the Negative Binomial distribution.

normal	<i>Specify Normal Prior Distribution</i>
--------	--

Description

Specify Normal Prior Distribution

Usage

```
normal(mean = 0, sd = 1)
```

Arguments

mean	Mean of the normal distribution (default 0)
sd	Standard deviation of the normal distribution (default 1)

Value

A prior distribution object

p_direction	<i>Probability of Direction (pd)</i>
-------------	--------------------------------------

Description

Estimate the probability that a parameter is strictly positive (or strictly negative) under the posterior, based on simulated draws from a `qbrms_fit`.

Usage

```
p_direction(object, parameters = NULL, nsim = 4000, null = 0)
```

Arguments

object	A <code>qbrms_fit</code> object.
parameters	Optional character vector of parameter names. If <code>NULL</code> , all fixed-effect coefficients are used.
nsim	Number of draws to simulate from the fitted summary.
null	Numeric value defining the reference for direction (default 0).

Value

A data frame of class `qbrms_p_direction`.

p_significance	<i>Probability of Practical Significance (Enhanced bayestestR-style)</i>
----------------	--

Description

Compute the probability that each parameter is above a threshold in the median's direction, similar to `bayestestR::p_significance()`. This represents the proportion of the posterior distribution that indicates a "significant" effect in the median's direction.

Usage

```
p_significance(
  object,
  parameters = NULL,
  threshold = "default",
  nsim = 1000,
  verbose = TRUE
)
```

Arguments

object	A qbrms_fit object.
parameters	Optional character vector of parameter names; if NULL, all fixed-effect coefficients are used.
threshold	The threshold value that separates significant from negligible effect: <ul style="list-style-type: none"> • "default": Uses 0.1 as threshold range around zero • A single numeric value (e.g., 0.1): Creates symmetric range around zero (-0.1, 0.1) • A numeric vector of length two (e.g., c(-0.2, 0.1)): Asymmetric threshold • A list of numeric vectors: Each vector corresponds to a parameter • A named list: Names correspond to parameter names
nsim	Number of draws to simulate for the approximation.
verbose	Logical; print progress information.

Value

A data frame of class qbrms_p_significance with columns Parameter, ps, Median, CI_low, CI_high, Threshold_low, Threshold_high, and Interpretation.

```
plot.qbrms_conditional_effects
```

Plot conditional effects for qbrms models

Description

Plot method for objects returned by [conditional_effects](#) and related helpers. For a single effect, this produces either a spaghetti plot of draws or a ribbon / slice plot of summary statistics. For multiple effects it can combine the plots using **patchwork** if available.

Usage

```
## S3 method for class 'qbrms_conditional_effects'
plot(x, ...)
```

Arguments

x	An object of class "qbrms_conditional_effects", typically the result of conditional_effects or conditional_effects_slices .
...	Currently ignored. Included for future extensions and method compatibility.

Value

For a single effect, a ggplot2 object. For multiple effects, either

- a **patchwork** object combining the individual plots (if the **patchwork** package is installed), or
- a named list of ggplot2 objects otherwise.

`plot.qbrms_diagnostics`*Plot Method for Diagnostics*

Description

Plot Method for Diagnostics

Usage

```
## S3 method for class 'qbrms_diagnostics'  
plot(x, which = "all", ...)
```

Arguments

<code>x</code>	A <code>qbrms_diagnostics</code> object
<code>which</code>	Character vector specifying which plots to show
<code>...</code>	Additional arguments (unused)

Value

Invisibly returns the input object `x`.

`plot.qbrms_p_significance`*Plot Method for Enhanced p_significance*

Description

Create a visual plot of probability of practical significance results.

Create a visual plot of probability of practical significance results.

Usage

```
## S3 method for class 'qbrms_p_significance'  
plot(x, ...)
```

```
## S3 method for class 'qbrms_p_significance'  
plot(x, ...)
```

Arguments

<code>x</code>	A <code>qbrms_p_significance</code> object from <code>p_significance()</code> .
<code>...</code>	Additional arguments passed to <code>ggplot2</code> functions.

Value

A ggplot2 object.

A ggplot2 object.

plot_parameters

Plot Parameters with Prior/Posterior Comparison

Description

Create density plots for multiple model parameters, optionally comparing posterior estimates with their priors. Returns a ggplot2 object with faceted parameter plots.

Create density plots for multiple model parameters, optionally comparing posterior estimates with their priors. Returns a ggplot2 object with faceted parameter plots.

Usage

```
plot_parameters(  
  object,  
  pars = NULL,  
  show_prior = FALSE,  
  ndraws = 200,  
  prior_ndraws = 200,  
  ncol = 2,  
  alpha_levels = c(0.8, 0.5),  
  colours = c("#1F78B4", "#E31A1C"),  
  verbose = TRUE,  
  ...  
)
```

```
plot_parameters(  
  object,  
  pars = NULL,  
  show_prior = FALSE,  
  ndraws = 200,  
  prior_ndraws = 200,  
  ncol = 2,  
  alpha_levels = c(0.8, 0.5),  
  colours = c("#1F78B4", "#E31A1C"),  
  verbose = TRUE,  
  ...  
)
```

Arguments

object A qbrms_fit object.

pars	Optional character vector of parameter names to plot. If NULL, plots all fixed-effect parameters.
show_prior	Logical; if TRUE, overlay prior distributions.
ndraws	Number of posterior draws to use for plotting.
prior_ndraws	Number of prior draws to use if show_prior = TRUE.
ncol	Number of columns for faceting (default 2).
alpha_levels	Numeric vector of length 2 giving alpha levels for c(posterior, prior). Default c(0.8, 0.5).
colours	Character vector of length 2 giving colours for c(posterior, prior). Default c("#1F78B4", "#E31A1C").
verbose	Logical; print progress information.
...	Additional arguments (currently unused).

Value

A ggplot2 object with faceted parameter density plots.

A ggplot2 object with faceted parameter density plots.

Examples

```
## Not run:
fit <- qbrms(y ~ x1 + x2, data = my_data, sample_prior = "yes")

# Plot all parameters
plot_parameters(fit)

# Plot specific parameters with priors
plot_parameters(fit, pars = c("x1", "x2"), show_prior = TRUE)

# Customize appearance
plot_parameters(fit, show_prior = TRUE) +
  theme_bw() +
  labs(title = "My Parameter Estimates")

## End(Not run)
## Not run:
fit <- qbrms(y ~ x1 + x2, data = my_data, sample_prior = "yes")

# Plot all parameters
plot_parameters(fit)

# Plot specific parameters with priors
plot_parameters(fit, pars = c("x1", "x2"), show_prior = TRUE)

# Customize appearance
plot_parameters(fit, show_prior = TRUE) +
  theme_bw() +
  labs(title = "My Parameter Estimates")

## End(Not run)
```

poisson	<i>Poisson Family</i>
---------	-----------------------

Description

Poisson Family

Usage

```
poisson()
```

Value

An object of class "family" representing the Poisson distribution.

pp_check	<i>Posterior and prior predictive checks</i>
----------	--

Description

Create posterior or prior predictive diagnostic plots for fitted qbrms models.

Usage

```
pp_check(object, ...)
```

```
## S3 method for class 'qbrms_fit'
```

```
pp_check(
  object,
  type = "dens_overlay",
  ndraws = 5000,
  seed = NULL,
  show_observed = FALSE,
  ...
)
```

```
## S3 method for class 'qbrms_prior'
```

```
pp_check(
  object,
  type = "dens_overlay",
  ndraws = 5000,
  seed = NULL,
  show_observed = FALSE,
  ...
)
```

Arguments

object	A model object.
...	Additional arguments passed to methods.
type	Character string indicating the check type: one of "dens_overlay", "hist", "scatter", "scatter_avg".
ndraws	Integer number of draws to use.
seed	Optional RNG seed.
show_observed	Logical; show observed data where applicable.

pp_check.tmb_ordinal_qbrms_fit

Posterior predictive checks for TMB ordinal models

Description

Posterior predictive checks for TMB ordinal models

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
pp_check(
  object,
  type = "bars",
  ndraws = 100,
  seed = NULL,
  newdata = NULL,
  prob = 0.9,
  ...
)
```

Arguments

object	A fitted TMB ordinal qbrms model object
type	Character; type of posterior predictive check
ndraws	Integer; number of posterior draws to use
seed	Random seed for reproducibility.
newdata	Optional data frame for predictions. If NULL, uses original data.
prob	Probability mass for credible intervals (default 0.95).
...	Additional arguments passed to methods.

Value

A ggplot object showing the posterior predictive check

```
print.qbrmb_fit      Print a qbrmb model fit
```

Description

Nicely formatted one-line summary plus key diagnostics for a qbrmb_fit.
 Prints a summary of a regularised binomial qbrms model.

Usage

```
## S3 method for class 'qbrmb_fit'
print(x, digits = 2, ...)

## S3 method for class 'qbrmb_fit'
print(x, digits = 2, ...)
```

Arguments

x	A qbrmb_fit object.
digits	Number of decimal places for output (default: 2).
...	Additional arguments (currently unused).

Value

Invisibly returns the input object x.

```
print.qbrms_diagnostics
      Print Method for Diagnostics
```

Description

Print Method for Diagnostics

Usage

```
## S3 method for class 'qbrms_diagnostics'
print(x, ...)
```

Arguments

x	A qbrms_diagnostics object
...	Additional arguments (unused)

Value

Invisibly returns the input object x.

print.qbrms_fit *Print Method for qbrms_fit Objects*

Description

Prints a summary of a fitted qbrms model object.

Usage

```
## S3 method for class 'qbrms_fit'  
print(x, digits = 2, ...)
```

Arguments

x	A qbrms_fit object.
digits	Number of decimal places for output (default: 2).
...	Additional arguments (currently unused).

Value

Invisibly returns the input object x.

Examples

```
if (requireNamespace("INLA", quietly = TRUE)) {  
  fit <- qbrms(mpg ~ hp, data = mtcars, family = gaussian(), verbose = FALSE)  
  print(fit)  
}
```

print.qbrms_kfold *Print Method for qbrms_kfold Objects*

Description

Print Method for qbrms_kfold Objects

Usage

```
## S3 method for class 'qbrms_kfold'  
print(x, ...)
```

Arguments

x	A qbrms_kfold object
...	Additional arguments (unused)

Value

Invisibly returns the input object x.

```
print.qbrms_loo_compare
```

Print Method for qbrms_loo_compare Objects

Description

Print Method for qbrms_loo_compare Objects

Usage

```
## S3 method for class 'qbrms_loo_compare'  
print(x, ...)
```

Arguments

x	A qbrms_loo_compare object
...	Additional arguments (unused)

Value

Invisibly returns the input object x.

```
print.qbrms_model_spec
```

Print Method for qbrms_model_spec

Description

Print Method for qbrms_model_spec

Usage

```
## S3 method for class 'qbrms_model_spec'  
print(x, ...)
```

Arguments

x	A qbrms_model_spec object
...	Additional arguments (unused)

Value

Invisibly returns the input object x.

```
print.qbrms_multinomial_fit
    Print method for multinomial qbrms fits
```

Description

Shorthand print method that delegates to `summary.qbrms_multinomial_fit()`.

Usage

```
## S3 method for class 'qbrms_multinomial_fit'
print(x, digits = 2, ...)
```

Arguments

x	A qbrms_multinomial_fit.
digits	Integer; number of decimal places to display.
...	Unused.

Value

The input x, returned invisibly.

```
print.qbrms_p_significance
    Print Method for Enhanced p_significance
```

Description

Print results from probability of practical significance analysis.

Usage

```
## S3 method for class 'qbrms_p_significance'
print(x, digits = 3, ...)

## S3 method for class 'qbrms_p_significance'
print(x, digits = 3, ...)
```

Arguments

x	A qbrms_p_significance object from <code>p_significance()</code> .
digits	Number of decimal places to display (default 3).
...	Additional arguments passed to <code>print.data.frame()</code> .

Value

Invisibly returns the input object.

Invisibly returns the input object.

```
print.qbrms_prior_build
```

Print method for qbrms_prior_build objects

Description

Nicely formats the result of `prior_build_from_beliefs()`, showing the elicited beliefs, implied prior distributions, and (optionally) the corresponding prior code.

Usage

```
## S3 method for class 'qbrms_prior_build'
print(
  x,
  digits = 3,
  show_data = FALSE,
  show_code = TRUE,
  code_object_name = "priors",
  max_terms = 12,
  ...
)
```

Arguments

<code>x</code>	An object of class "qbrms_prior_build" as returned by prior_build_from_beliefs .
<code>digits</code>	Integer scalar giving the number of decimal places to display for numeric summaries (default: 3).
<code>show_data</code>	Logical; if TRUE, print a compact summary of the elicitation data used to construct the priors.
<code>show_code</code>	Logical; if TRUE, print the corresponding prior code that can be copied into a modelling script.
<code>code_object_name</code>	Character string giving the name that will be used for the prior object in the displayed code (default: "priors").
<code>max_terms</code>	Integer scalar giving the maximum number of individual terms to display before truncating the printed output (default: 12).
<code>...</code>	Currently ignored. Included for method compatibility.

Value

Invisibly returns the input object `x`.

```
print.qbrms_prior_code
```

Print method for qbrms_prior_code objects

Description

Print method for qbrms_prior_code objects

Usage

```
## S3 method for class 'qbrms_prior_code'  
print(x, ...)
```

Arguments

x	A qbrms_prior_code object
...	Additional arguments passed to cat

Value

Invisibly returns the input object x.

```
print.qbrms_prior_diagnostics
```

Print method for qbrms_prior_diagnostics objects

Description

Print method for qbrms_prior_diagnostics objects

Usage

```
## S3 method for class 'qbrms_prior_diagnostics'  
print(x, digits = 3, ...)
```

Arguments

x	A qbrms_prior_diagnostics object
digits	Number of decimal places to display (default 3) # <- ADD THIS LINE
...	Additional arguments (unused)

Value

The input object, returned invisibly

```
print.qbrms_prior_dist
```

Print Prior Distribution Objects

Description

Print Prior Distribution Objects

Usage

```
## S3 method for class 'qbrms_prior_dist'  
print(x, ...)
```

Arguments

x	A qbrms_prior_dist object
...	Unused

Value

Invisibly returns x.

```
print.qbrms_prior_list
```

Print Prior List Objects

Description

Print Prior List Objects

Usage

```
## S3 method for class 'qbrms_prior_list'  
print(x, ...)
```

Arguments

x	A qbrms_prior_list object
...	Unused

Value

Invisibly returns x.

print.qbrms_prior_spec *Print Prior Specification Objects*

Description

Print Prior Specification Objects

Usage

```
## S3 method for class 'qbrms_prior_spec'  
print(x, ...)
```

Arguments

x	A qbrms_prior_spec object
...	Unused

Value

Invisibly returns x.

print.qbrmsformula *Print method for qbrms formulas*

Description

Print method for qbrms formulas

Usage

```
## S3 method for class 'qbrmsformula'  
print(x, ...)
```

Arguments

x	A qbrmsformula object
...	Unused

Value

Invisibly returns the input object x.

```
print.summary.qbrms_fit
```

Print Method for summary.qbrms_fit Objects

Description

Print Method for summary.qbrms_fit Objects

Usage

```
## S3 method for class 'summary.qbrms_fit'  
print(x, ...)
```

Arguments

x	A summary.qbrms_fit object.
...	Additional arguments (currently unused).

Value

Invisibly returns the input object x.

```
print.tmb_ordinal_qbrms_fit
```

Print Method for TMB Ordinal Fits

Description

Print Method for TMB Ordinal Fits

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'  
print(x, digits = 2, ...)
```

Arguments

x	A tmb_ordinal_qbrms_fit object
digits	Number of decimal places for output
...	Additional arguments

Value

Invisibly returns the object

prior *Specify Prior for Model Parameters*

Description

Specify Prior for Model Parameters

Usage

```
prior(prior, class = "b", coef = NULL, group = NULL)
```

Arguments

prior	A prior distribution object.
class	Parameter class ("Intercept", "b", "sd", etc.)
coef	Specific coefficient name (optional)
group	Specific group name for random effects (optional)

Value

A prior specification object

prior_build_from_beliefs
Prior Build from Beliefs

Description

Build priors from elicited beliefs (GLM-aware)

Usage

```
prior_build_from_beliefs(  
  formula,  
  data,  
  family = gaussian(),  
  beliefs = list(),  
  outcome_location = NULL,  
  outcome_interval = NULL,  
  outcome_level = 0.95,  
  outcome_sd = NULL,  
  standardise = TRUE,  
  plausible_range = NULL,  
  target_coverage = 0.8,  
  tune = FALSE,  
  seed = NULL  
)
```

Arguments

formula	Model formula
data	Data frame
family	Model family
beliefs	List of beliefs about parameters
outcome_location	Expected outcome location
outcome_interval	Expected outcome interval
outcome_level	Confidence level for outcome interval
outcome_sd	Outcome standard deviation
standardise	Whether to standardise predictors
plausible_range	Plausible range for outcomes
target_coverage	Target coverage probability
tune	Whether to tune priors
seed	Random seed

Value

An object of class "qbrms_prior_build" containing:

- priors: A list of prior specifications.
- prior_code: Character string of R code to reproduce the priors.
- formula: The (possibly modified) model formula.
- data: The (possibly standardised) data.
- diagnostics: Prior predictive diagnostic information.

prior_code

Format priors as qbrms prior() code

Description

Format priors as qbrms prior() code

Usage

```
prior_code(build, object_name = "priors", digits = 3, include_comments = TRUE)
```

Arguments

build	A 'qbrms_prior_build' returned by prior_build_from_beliefs()
object_name	Name of the object on the left-hand side (default "priors")
digits	Number of decimal places to print
include_comments	Logical; if TRUE, prepend a short comment header

Value

A single character string containing formatted R code

prior_pp_diagnostics *Prior predictive diagnostics and sensibility report*

Description

Summarise prior predictive draws to check basic support, scale and shape, and (optionally) how simple statistics of the observed data compare with the prior-predictive distribution. Returns an object with a concise verdict.

Usage

```
prior_pp_diagnostics(
  object,
  level = 0.95,
  support = NULL,
  lower = NULL,
  upper = NULL,
  trials = NULL,
  plausible_lower = NULL,
  plausible_upper = NULL,
  include_observed = TRUE,
  seed = NULL
)
```

Arguments

object	A qbrms prior object: qbrms_prior_fit, qbrms_prior_only, or a qbrms_fit that contains prior_samples.
level	Credible level for central intervals (default 0.95). Reserved.
support	Optional override of the implied support: one of "real", "positive", "proportion", or "bounded". If NULL, an attempt is made to infer from the family.
lower, upper	Optional numeric bounds used when support = "bounded". If support = "proportion", the default is c(0, 1).
trials	Optional integer vector for binomial data (bounds helper).

plausible_lower, plausible_upper	Optional numeric bounds defining a user-declared “plausible range” for the outcome on the response scale. When both are supplied, the function reports the fraction of prior-predictive mass that falls in [plausible_lower, plausible_upper] and incorporates this into the verdict.
include_observed	Logical; if TRUE and the object contains data, the report compares simple statistics of y to their prior-predictive reference distributions.
seed	Optional seed for reproducibility.

Value

An object of class `qbrms_prior_diagnostics`.

<code>prior_pp_summary</code>	<i>A convenience wrapper mirroring <code>pp_check</code>'s <code>show_observed</code> flag</i>
-------------------------------	--

Description

A convenience wrapper mirroring `pp_check`'s `show_observed` flag

Usage

```
prior_pp_summary(
  object,
  show_observed = FALSE,
  plausible_lower = NULL,
  plausible_upper = NULL,
  ...
)
```

Arguments

<code>object</code>	A <code>qbrms</code> prior object.
<code>show_observed</code>	Logical; compare observed summaries when available.
<code>plausible_lower, plausible_upper</code>	Optional plausible range bounds to score coverage.
<code>...</code>	Passed to <code>prior_pp_diagnostics()</code> .

Value

The diagnostics object, invisibly, after printing a summary.

`prior_predictive_check`*Create Prior Predictive Distribution Plot*

Description

Generate predictions from the prior distribution to assess whether priors are reasonable before seeing the data.

Usage

```
prior_predictive_check(formula, data, family, prior, n_samples = 1000)
```

Arguments

<code>formula</code>	Model formula
<code>data</code>	Data frame (used for structure, not values)
<code>family</code>	Model family
<code>prior</code>	Prior specification
<code>n_samples</code>	Number of prior predictive samples (default: 1000)

Value

A ggplot object showing the prior predictive distribution

Examples

```
## Not run:  
prior_predictive_check(  
  mpg ~ hp + wt,  
  data = mtcars,  
  family = gaussian(),  
  prior = prior(normal(0, 10), class = "b")  
)  
  
## End(Not run)
```

prior_to_posterior_workflow

Complete Prior-to-Posterior Workflow

Description

Fit a model with priors sampled, then produce a comparison density plot that overlays posterior, prior, and observed distributions where available.

Usage

```
prior_to_posterior_workflow(
  formula,
  data,
  family = gaussian(),
  prior = NULL,
  verbose = TRUE,
  ...
)
```

Arguments

formula	Model formula.
data	Data frame.
family	Model family (default gaussian()).
prior	Prior specification (default NULL).
verbose	Logical; print progress messages.
...	Additional arguments forwarded to qbrms().

Value

A list of class qbrms_workflow_result with elements fit and plot.

priors

Prior Distribution Specifications

Description

Functions to specify prior distributions for qbrms models

qbrm	<i>Alias for qbrms()</i>
------	--------------------------

Description

qbrm() is a shorter alias for qbrms() with identical functionality.

Enhanced interface to qbrms with all required parameters and built-in diagnostics.

Usage

```
qbrm(
  formula,
  data,
  family = gaussian(),
  prior = NULL,
  sample_prior = "no",
  verbose = TRUE,
  ...
)
```

```
qbrm(
  formula,
  data,
  family = gaussian(),
  prior = NULL,
  sample_prior = "no",
  verbose = TRUE,
  ...
)
```

Arguments

formula	Model formula in lme4/brms style.
data	Data frame containing the variables in the model.
family	Model family (default: gaussian()).
prior	Prior specifications (default: NULL).
sample_prior	Whether to sample from priors ("no", "yes", "only"). Default: "no".
verbose	Logical; print diagnostic information (default: TRUE).
...	Additional arguments passed to qbrms().

Value

An object of class "qbrms_fit", same as qbrms().

A qbrms_fit object with model results.

See Also[qbrms](#)

qbrmb

*Enhanced binomial mixed-effects modelling***Description**

Fits a regularised binomial (or Bernoulli) mixed-effects model using INLA, with enhanced diagnostics, stability checks and strategy selection.

Usage

```
qbrmb(
  formula,
  data,
  family = "binomial",
  strategy = "auto",
  regularisation_strength = 0.1,
  use_data_augmentation = TRUE,
  min_group_size = 5,
  verbose = FALSE,
  diagnostics = FALSE,
  silent = FALSE,
  ...
)
```

Arguments

formula	Model formula with random effects in lme4-style syntax.
data	Data frame containing the variables in the model.
family	Model family (currently "binomial" or "bernoulli"; default "binomial").
strategy	Fitting strategy: "auto", "enhanced", "aggressive", or "minimal".
regularisation_strength	Regularisation strength in the interval $[0, 1]$ (default 0.1).
use_data_augmentation	Logical; if TRUE, add pseudo-observations for additional numerical stability.
min_group_size	Minimum group size before triggering diagnostic warnings.
verbose	Logical; if TRUE, show detailed progress and diagnostics while fitting.
diagnostics	Logical; if TRUE, compute and store extended diagnostics in the returned object.
silent	Logical; if TRUE, suppress printed output except errors.
...	Additional arguments passed to <code>INLA::inla()</code> .

Value

An object of class `c("qbrmb_fit", "qbrms_fit", "list")` containing the fitted model, diagnostics and metadata.

qbrmb_aggressive	<i>Aggressively regularised binomial mixed-effects model</i>
------------------	--

Description

Convenience wrapper around `qbrmb` using the "aggressive" strategy with a higher default regularisation strength.

Usage

```
qbrmb_aggressive(formula, data, verbose = FALSE, ...)
```

Arguments

formula	Model formula with random effects (lme4-style).
data	Data frame containing the variables in the model.
verbose	Logical; if TRUE, show detailed diagnostics.
...	Additional arguments passed to <code>qbrmb</code> .

Value

An object of class `c("qbrmb_fit", "qbrms_fit", "list")`.

Examples

```
if (requireNamespace("INLA", quietly = TRUE)) {
  set.seed(123)
  data <- data.frame(
    y = rbinom(100, 1, 0.2),
    x = rnorm(100),
    group = factor(rep(1:10, each = 10))
  )
  # qbrmb_aggressive requires a mixed model with random intercepts
  fit <- qbrmb_aggressive(y ~ x + (1 | group), data = data, verbose = FALSE)
}
```

qbrmb_regularised	<i>Regularised binomial mixed-effects (enhanced strategy)</i>
-------------------	---

Description

Convenience wrapper around [qbrmb](#) using the "enhanced" regularisation strategy and a stronger default regularisation strength.

Usage

```
qbrmb_regularised(formula, data, verbose = FALSE, ...)
```

Arguments

formula	Model formula with random effects (lme4-style).
data	Data frame containing the variables in the model.
verbose	Logical; if TRUE, show detailed diagnostics.
...	Additional arguments passed to qbrmb .

Value

An object of class c("qbrmb_fit", "qbrms_fit", "list").

qbrmO	<i>Quick Bayesian Ordinal Regression Models with Adaptive Centering</i>
-------	---

Description

Fits ordinal regression models using Template Model Builder (TMB) with Laplace approximation and adaptive threshold centering to match brms output.

Usage

```
qbrmO(
  formula,
  data,
  family = cumulative(),
  prior = NULL,
  verbose = FALSE,
  threshold_method = "quantile",
  control = list(),
  ...
)
```

Arguments

formula	Model formula with ordinal response on the left-hand side.
data	Data frame containing the variables in the model.
family	Ordinal family specification. Currently supports cumulative().
prior	Prior specifications using qbrms prior syntax.
verbose	Logical; print progress messages during fitting.
threshold_method	Method for threshold centering ("quantile" or "cumulative_mean").
control	List of control parameters for TMB optimization.
...	Additional arguments passed to TMB functions.

Value

An object of class `c("tmb_ordinal_qbrms_fit", "qbrms_fit")`

qbrms *Quick Bayesian Regression Models with Automatic Routing*

Description

Enhanced qbrms interface with automatic routing to specialised implementations. Supports ordinal regression via TMB, quantile regression, and all standard INLA families.

Usage

```
qbrms(
  formula,
  data,
  family = gaussian(),
  prior = NULL,
  sample_prior = "no",
  quantile = 0.5,
  control.compute = list(dic = TRUE, waic = TRUE, cpo = TRUE),
  verbose = getOption("qbrms.verbose", FALSE),
  ...
)
```

Arguments

formula	Model formula in lme4/brms style
data	Data frame containing the variables in the model
family	Model family (default: gaussian()). Ordinal families automatically route to qbrmO()
prior	Prior specifications (default: NULL)

sample_prior	Whether to sample from priors ("no", "yes", "only"). Default: "no"
quantile	For asymmetric_laplace family, which quantile to estimate (default: 0.5)
control.compute	INLA control settings for model information criteria
verbose	Logical; print diagnostic information (default: <code>getOption("qbrms.verbose", FALSE)</code>)
...	Additional arguments passed to fitting functions

Value

An object of class "qbrms_fit" (or "qbrm0_fit" for ordinal models). The object is a list containing:

- fit: The internal model fit (INLA or TMB object).
- model_type: String indicating the type of model fitted.
- data: The data used for fitting.
- original_formula: The formula used.
- prior_samples: Prior predictive samples (if requested).

See Also

[qbrm0](#) for direct ordinal model fitting

qbrms-model-criteria *Model comparison criteria for qbrms models*

Description

Compute approximate DIC, LOO and WAIC for qbrms model fits.

Usage

```

waic(object, ...)

loo(object, ...)

dic(object, ...)

## S3 method for class 'qbrms_fit'
waic(object, ...)

## S3 method for class 'qbrms_fit'
loo(object, ...)

## S3 method for class 'qbrms_fit'
dic(object, ...)

```

Arguments

object A qbrms_fit object.
 ... Additional arguments passed to internal methods or underlying tools.

Details

These functions provide generic interfaces (`dic()`, `loo()`, `waic()`) and S3 methods for `qbrms_fit` objects that extract the corresponding criteria from the underlying INLA fit where available.

Value

For `dic()`, `loo()` and `waic()` methods on `qbrms_fit` objects, a list containing the corresponding criterion (for example, `list(dic = ...)`, `list(looic = ..., elpd_loo = ...)`, or `list(waic = ...)`). If the criterion cannot be computed, `NA_real_` is returned.

qbrms_bayesian_analysis

Bayesian Analysis Functions (qbrms)

Description

Posterior analysis tools for qbrms models: Bayes factors, probability of direction, ROPE, HDI, and estimated marginal means.

qbrms_binomial_regularised

Fixed Regularised Binomial Mixed Effects Fitting

Description

Fits binomial mixed effects models with regularisation, with all parameters handled correctly.

Usage

```
qbrms_binomial_regularised(
  formula,
  data,
  regularise = TRUE,
  sample_prior = "no",
  verbose = TRUE,
  ...
)
```

Arguments

formula	Model formula with mixed effects structure.
data	Data frame containing the variables.
regularise	Logical; if TRUE, apply regularisation techniques.
sample_prior	Whether to sample from priors ("no", "yes", "only"). Default: "no".
verbose	Logical; print progress information.
...	Additional arguments passed to qbrms().

Value

A qbrms_fit object with additional regularisation metadata.

qbrms_emmeans	<i>Estimated Marginal Means for qbrms models</i>
---------------	--

Description

Compute estimated marginal means (least-squares means) for factor terms and their combinations for a qbrms_fit, using a multivariate-normal approximation to the posterior of the fixed effects.

Usage

```
qbrms_emmeans(object, specs, at = NULL, nsim = 1000, prob = 0.95, ...)
```

Arguments

object	A qbrms_fit.
specs	Character vector naming factor(s) for EMMs, or a string containing a formula with a right-hand side (for example, "~ group" or "y ~ group"). If multiple terms are provided, a full grid is used.
at	Optional named list giving values at which to hold other predictors. Numerics are fixed at their means if not supplied; factors at their modal level.
nsim	Number of posterior draws for uncertainty.
prob	Interval mass (default 0.95).
...	Additional arguments (currently not used).

Value

A data frame of class qbrms_emmeans.

qbrms_fit_log	<i>Get captured fit log from a qbrms object (if available)</i>
---------------	--

Description

Get captured fit log from a qbrms object (if available)

Usage

```
qbrms_fit_log(x)
```

Arguments

x A qbrms_fit / qbrmO_fit object returned by qbrm()/qbrms()

Value

A character vector of captured console lines, or NULL if none

qbrms_ordinal_binary	<i>Ordinal regression via binary decomposition (fallback)</i>
----------------------	---

Description

Splits an ordered response with K levels into K-1 binary problems (thresholds $y > c_j$) and fits a simple binomial GLM for each split.

Usage

```
qbrms_ordinal_binary(formula, data, verbose = FALSE, ...)
```

Arguments

formula	Model formula with an ordered response on the LHS.
data	Data frame.
verbose	Logical; print progress messages.
...	Ignored (compat).

Value

An object of class `c("ordinal_binary_qbrms_fit", "qbrms_fit")` with:

- `binary_models`: list of length K-1 of fitted glm objects
- `thresholds`: character vector of thresholds used
- `response`: response variable name
- `levels`: factor levels of the ordered response
- `ordinal_levels`: factor levels (for test compatibility)

qbrms_set_verbosity *Set qbrms verbosity for the current session*

Description

Set qbrms verbosity for the current session

Usage

```
qbrms_set_verbosity(verbose = FALSE)
```

Arguments

verbose Logical. If TRUE, fitting prints progress; if FALSE, fitting is silent.

Value

Invisibly returns the previous value.

quick_density_comparison
Quick Density Comparison

Description

Quick Density Comparison

Usage

```
quick_density_comparison(object, parameter = NULL, ...)
```

Arguments

object A qbrms_fit object.
parameter Optional parameter name to focus the comparison.
... Additional arguments forwarded to density_plot().

Value

A ggplot2 object.

random_walk_families *Random Walk Families*

Description

Random Walk Families

Usage

```
rw1(scale.model = "log", diagonal = 1e-06)
```

```
rw2(scale.model = "log", diagonal = 1e-06)
```

Arguments

scale.model	Scaling model for precision
diagonal	Diagonal precision matrix structure

Value

A family object of class "family".

residuals.qbrms_fit *Extract residuals from qbrms models*

Description

Extract residuals from qbrms models

Usage

```
## S3 method for class 'qbrms_fit'  
residuals(object, type = "response", ...)
```

Arguments

object	A qbrms_fit object
type	Character string indicating type of residuals (default: "response")
...	Additional arguments (currently unused)

Value

Numeric vector of residuals

Examples

```
## Not run:
fit <- qbrms(mpg ~ hp, data = mtcars, family = gaussian())
resid_values <- residuals(fit, type = "response")

## End(Not run)
```

rope_analysis	<i>ROPE analysis</i>
---------------	----------------------

Description

Compute the posterior mass inside a Region Of Practical Equivalence (ROPE) for selected parameters.

Usage

```
rope_analysis(object, parameters = NULL, rope = c(-0.1, 0.1), nsim = 4000)
```

Arguments

object	A qbrms_fit.
parameters	Optional character vector of parameter names. If NULL, all fixed-effect coefficients are used.
rope	Numeric length-2 vector c(lower, upper).
nsim	Number of posterior draws to simulate.

Value

A data frame of class qbrms_rope.

simplex	<i>Simplex Family for Compositional Data</i>
---------	--

Description

Simplex Family for Compositional Data

Usage

```
simplex(link = "logit", link.precision = "log")
```

Arguments

link Link function for the mean (default: "logit")
link.precision Link function for precision parameter (default: "log")

Value

A family object of class "family".

skew_normal	<i>Skew Normal Family</i>
-------------	---------------------------

Description

Skew Normal Family

Usage

```
skew_normal()
```

Value

An object of class "family" representing the Skew Normal distribution.

student_t	<i>Student's t Family for Robust Regression</i>
-----------	---

Description

Student's t-distribution family for robust regression with heavier tails than Gaussian to handle outliers.

Functions that act as both family constructors (for qbrm) and prior specifications (for prior), depending on arguments.

Usage

```
student_t(
  link_or_df = "identity",
  location = 0,
  scale = 1,
  link = NULL,
  link.sigma = "log",
  link.nu = "log",
  ...
)
```

```
student()

student_t(
  link_or_df = "identity",
  location = 0,
  scale = 1,
  link = NULL,
  link.sigma = "log",
  link.nu = "log",
  ...
)

student_t_prior(
  link_or_df = 3,
  location = 0,
  scale = 1,
  link.sigma = "log",
  link.nu = "log"
)
```

Arguments

link_or_df	For family: link function (character). For prior: degrees of freedom (numeric).
location	Location parameter (prior only).
scale	Scale parameter (prior only).
link	Optional link function (if acting as family).
link.sigma	Link for sigma (family only).
link.nu	Link for nu (family only).
...	Additional arguments.

Value

An object of class "family" specifying the Student-t distribution.
An object of class "family" specifying the Student-t distribution.
A family object or prior object depending on inputs.

Examples

```
# Create a Student-t family object
fam <- student_t()
print(fam$family)
```

summary.qbrmb_fit *Summary Method for qbrmb_fit Objects*

Description

Provides a detailed summary of a regularised binomial qbrms model.

Usage

```
## S3 method for class 'qbrmb_fit'
summary(object, digits = 2, ...)
```

Arguments

object	A qbrmb_fit object.
digits	Number of decimal places for output (default: 2).
...	Additional arguments (currently unused).

Value

An object of class "summary.qbrmb_fit" containing model summary information.

summary.qbrms_fit *Summary Method for qbrms_fit Objects*

Description

Provides a detailed summary of a fitted qbrms model.

Usage

```
## S3 method for class 'qbrms_fit'
summary(object, ..., digits = 2)
```

```
## S3 method for class 'qbrms_fit'
summary(object, ..., digits = 2)
```

Arguments

object	A qbrms_fit object
...	Additional arguments
digits	Number of digits for output (default 2)

Value

An object of class "summary.qbrms_fit" containing:

- formula: The model formula.
- family: The distribution family.
- nobs: Number of observations.
- fixed: Data frame of fixed effects estimates.
- random: Random effects summary (if applicable).

Examples

```
if (requireNamespace("INLA", quietly = TRUE)) {
  fit <- qbrms(mpg ~ hp, data = mtcars, family = gaussian(), verbose = FALSE)
  summary(fit)
}
```

summary.qbrms_multinomial_fit

Summary method for multinomial qbrms fits

Description

Print a readable summary of a qbrms_multinomial_fit, including its reference category, the list of categories, and per-category fixed-effect summaries when available.

Usage

```
## S3 method for class 'qbrms_multinomial_fit'
summary(object, digits = 2, ...)
```

Arguments

object	A qbrms_multinomial_fit.
digits	Integer; number of decimal places to display.
...	Unused.

Value

The input object, returned invisibly.

```
summary.qbrms_p_significance
    Summary Method for Enhanced p_significance
```

Description

Provide a summary of probability of practical significance results.

Usage

```
## S3 method for class 'qbrms_p_significance'
summary(object, ...)

## S3 method for class 'qbrms_p_significance'
summary(object, ...)
```

Arguments

object	A qbrms_p_significance object from p_significance().
...	Additional arguments (currently unused).

Value

Invisibly returns the input object.
 Invisibly returns the input object.

```
summary.tmb_ordinal_qbrms_fit
    Summary Method for TMB Ordinal Fits
```

Description

Summary Method for TMB Ordinal Fits

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
summary(object, digits = 2, ...)
```

Arguments

object	A tmb_ordinal_qbrms_fit object
digits	Number of decimal places for output
...	Additional arguments

Value

Invisibly returns the object

 tab_model

Create HTML Table for qbrms Models with Enhanced Styling

Description

Generate APA-style HTML tables for qbrms model outputs with customizable styling options.

Usage

```
tab_model(
  ...,
  show.ci = TRUE,
  ci.lvl = 0.95,
  show.ropc = FALSE,
  rope = c(-0.1, 0.1),
  show.p_sig = FALSE,
  show.pd = FALSE,
  show.bf = FALSE,
  digits = 2,
  title = "Model Results",
  file = NULL,
  CSS = NULL,
  dv.labels = NULL,
  pred.labels = NULL,
  show.intercept = TRUE,
  show.r2 = FALSE,
  show.icc = FALSE,
  show.nobs = TRUE,
  bootstrap = TRUE,
  table.style = "default",
  font.family = "system-ui, -apple-system, sans-serif",
  font.size = "14px",
  header.bg = "#f8f9fa",
  stripe.bg = "#f9f9f9",
  verbose = FALSE
)
```

Arguments

...	One or more qbrms_fit objects to display in the table
show.ci	Logical; show credible intervals (default TRUE)
ci.lvl	Credible interval level (default 0.95)
show.ropc	Logical; show ROPE analysis (default FALSE)

rope	Numeric vector c(lower, upper) for ROPE bounds
show.p_sig	Logical; show probability of practical significance (default FALSE)
show.pd	Logical; show probability of direction (default FALSE)
show.bf	Logical; show Bayes factors (default FALSE)
digits	Number of decimal places (default 2)
title	Character; table title
file	Character; file path to save HTML output (optional)
CSS	Character; custom CSS styling (optional)
dv.labels	Character vector of dependent variable labels
pred.labels	Named character vector for predictor labels
show.intercept	Logical; show intercept row (default TRUE)
show.r2	Logical; show R-squared if available (default FALSE)
show.icc	Logical; show ICC for mixed models (default FALSE)
show.nobs	Logical; show number of observations (default TRUE)
bootstrap	Logical; use Bootstrap CSS framework (default TRUE)
table.style	Character; table style theme. Options: "default", "minimal", "academic", "modern"
font.family	Character; CSS font family (default "system-ui")
font.size	Character; base font size (default "14px")
header.bg	Character; header background colour (default "#f8f9fa")
stripe.bg	Character; striped row background colour (default "#f9f9f9")
verbose	Logical; print progress (default FALSE)

Value

An object of class "qbrms_html_table" containing the HTML code

test_corrected_bayes_R2

Test the corrected implementation with a mixed-effects example

Description

Test the corrected implementation with a mixed-effects example

Usage

test_corrected_bayes_R2()

Examples

```
## Not run:
# Test with mixed-effects model
library(qbrms)

# Create sample data with strong group effects
set.seed(123)
n_groups <- 10
n_per_group <- 20
n_total <- n_groups * n_per_group

data <- data.frame(
  group = factor(rep(1:n_groups, each = n_per_group)),
  x = rnorm(n_total),
  group_effect = rep(rnorm(n_groups, 0, 2), each = n_per_group)
)

# Generate response with strong group effects
data$y <- 2 + 0.5 * data$x + data$group_effect + rnorm(n_total, 0, 0.5)

# Fit mixed-effects model
fit_mixed <- qbrms(y ~ x + (1|group), data = data, family = gaussian())

# Compute Bayesian R-squared (should now match brms closely)
r2_corrected <- bayes_R2(fit_mixed, verbose = TRUE)
print(r2_corrected)

# Should show high R-squared due to strong group effects

## End(Not run)
```

uniform

Specify Uniform Prior Distribution

Description

Specify Uniform Prior Distribution

Usage

```
uniform(min = -Inf, max = Inf)
```

Arguments

min	Lower bound (default -Inf)
max	Upper bound (default Inf)

Value

A prior distribution object

`validate_family_quantile`*Validate Family Quantile Combination*

Description

Check if a family supports quantile regression with a given quantile value. Throws informative errors for invalid combinations.

Usage

```
validate_family_quantile(family_name, quantile)
```

Arguments

<code>family_name</code>	Character string specifying the family name.
<code>quantile</code>	Numeric quantile value (or NULL).

Value

TRUE if the combination is valid (invisibly), throws error otherwise.

`vcov.qbrms_fit`*Extract Variance-Covariance Matrix from qbrms Models*

Description

Extract Variance-Covariance Matrix from qbrms Models

Usage

```
## S3 method for class 'qbrms_fit'  
vcov(object, ...)
```

Arguments

<code>object</code>	A qbrms_fit object
<code>...</code>	Additional arguments (unused)

Value

Variance-covariance matrix

```
vcov.tmb_ordinal_qbrms_fit
```

Variance-Covariance Matrix Method for TMB Ordinal Fits

Description

Variance-Covariance Matrix Method for TMB Ordinal Fits

Usage

```
## S3 method for class 'tmb_ordinal_qbrms_fit'
vcov(object, ...)
```

Arguments

object	A tmb_ordinal_qbrms_fit object
...	Additional arguments

Value

Variance-covariance matrix

```
view_table
```

Display HTML Table in Viewer

Description

Display HTML Table in Viewer

Usage

```
view_table(x)
```

Arguments

x	A qbrms_html_table created by tab_model().
---	--

visualise_prior *Visualise Prior Distributions*

Description

Create visual representations of prior distributions to aid in prior specification and sensitivity analysis.

Usage

```
visualise_prior(  
  prior,  
  parameter = NULL,  
  xlim = NULL,  
  add_reference = TRUE,  
  samples = 10000  
)
```

Arguments

prior	Prior specification in qbrms format, or a list of prior specifications to compare
parameter	Character string specifying which parameter to visualise (e.g., "b", "sd", "sigma"). If NULL, visualises all priors.
xlim	Numeric vector of length 2 specifying x-axis limits. If NULL, automatically determined.
add_reference	Logical; if TRUE, adds reference distributions for comparison (default: TRUE)
samples	Number of samples to draw for visualisation (default: 10000)

Details

This function helps users:

- Visualise the implications of their prior choices
- Compare different prior specifications
- Identify overly informative or vague priors
- Understand prior-data conflict potential

Supported prior distributions include:

- Normal: `normal(mean, sd)`
- Student t: `student_t(df, mean, scale)`
- Cauchy: `cauchy(location, scale)`
- Exponential: `exponential(rate)`
- Gamma: `gamma(shape, rate)`
- Uniform: `uniform(lower, upper)`

Value

A ggplot object showing the prior distribution(s)

Examples

```
## Not run:
# Visualise a single prior
prior <- prior(normal(0, 10), class = "b")
visualise_prior(prior)

# Compare different priors
prior_list <- list(
  "Weak" = prior(normal(0, 10), class = "b"),
  "Medium" = prior(normal(0, 5), class = "b"),
  "Strong" = prior(normal(0, 1), class = "b")
)
visualise_prior(prior_list)

# Visualise with custom limits
visualise_prior(prior, xlim = c(-20, 20))

## End(Not run)
```

weibull

Weibull Survival Family

Description

Weibull Survival Family

Usage

```
weibull(link = "log", link.shape = "log")
```

Arguments

link	Link function for scale (default: "log")
link.shape	Link function for shape (default: "log")

Value

A family object of class "family".

zero_inflated_negbinomial
Zero-Inflated Negative Binomial Family

Description

Zero-Inflated Negative Binomial Family

Usage

```
zero_inflated_negbinomial(link = "log", link.zi = "logit")  
zinb(link = "log", link.zi = "logit")
```

Arguments

link	Link function for mean (default: "log")
link.zi	Link function for zero-inflation (default: "logit")

Value

A family object of class "family".

zero_inflated_poisson *Zero-Inflated Poisson Family*

Description

Zero-Inflated Poisson Family

Usage

```
zero_inflated_poisson(link = "log", link.zi = "logit")  
zip()
```

Arguments

link	Link function for mean (default: "log")
link.zi	Link function for zero-inflation (default: "logit")

Value

A family object of class "family".

Index

- * **package**
 - qbrms-package, 5

- asymmetric_laplace, 6

- bayes_R2, 6
- bayesfactor, 7
- Beta, 8
- beta0 (beta_variants), 10
- beta1 (beta_variants), 10
- beta_binomial, 9
- beta_prior, 9
- beta_variants, 10
- bf, 10
- binomial, 11

- c.qbrms_prior_spec, 12
- cauchy, 12
- check_convergence, 13
- circular_normal, 13
- coef.qbrms_fit, 14
- coef.qbrms_multinomial_fit, 14
- coef.tmb_ordinal_qbrms_fit, 15
- compare_models, 15
- compare_significance, 16
- conditional_effects, 16, 44
- conditional_effects.qbrms_fit, 17
- conditional_effects.tmb_ordinal_qbrms_fit, 18
- conditional_effects_slices, 19, 44
- convert_family_to_inla, 20
- create_dummy_data, 20
- create_prior_object, 21
- cumulative, 22

- default_priors, 22
- density_plot, 23
- diagnose_binomial_mixed, 24
- diagnose_model, 24
- dic (qbrms-model-criteria), 70

- double_exponential (laplace), 37
- drop_random_effects, 26

- emmeans, 26
- exponential, 27
- export_model, 27

- family_info, 29
- family_supports_quantile, 29
- fitted.qbrms_fit, 30
- fitted.tmb_ordinal_qbrms_fit, 30

- Gamma (Gamma_family), 31
- gamma, 31
- Gamma_family, 31
- gamma_prior (gamma), 31
- gaussian, 32
- gen_student_t, 32
- get_default_prior, 33
- gev, 33
- gumbel (gev), 33

- hdi, 34
- hurdle_families, 34
- hurdle_negbinomial (hurdle_families), 34
- hurdle_poisson (hurdle_families), 34

- iid, 35
- import_model, 35

- kfold_cv, 36

- laplace, 37
- list_extended_families, 38
- logitbeta (beta_variants), 10
- lognormal, 38
- lognormal_prior (lognormal), 38
- loo (qbrms-model-criteria), 70
- loo_compare, 39

- model_builder, 5, 39

- model_lab_addin, 40
- model_workflow_addin, 41
- multinomial, 41
- neg_binomial, 41
- negbinomial, 42
- normal, 42
- p_direction, 43
- p_significance, 43
- plot.qbrms_conditional_effects, 44
- plot.qbrms_diagnostics, 45
- plot.qbrms_p_significance, 45
- plot_parameters, 46
- poisson, 48
- pp_check, 48
- pp_check.tmb_ordinal_qbrms_fit, 49
- print.qbrmb_fit, 50
- print.qbrms_diagnostics, 50
- print.qbrms_fit, 51
- print.qbrms_kfold, 51
- print.qbrms_loo_compare, 52
- print.qbrms_model_spec, 52
- print.qbrms_multinomial_fit, 53
- print.qbrms_p_significance, 53
- print.qbrms_prior_build, 54
- print.qbrms_prior_code, 55
- print.qbrms_prior_diagnostics, 55
- print.qbrms_prior_dist, 56
- print.qbrms_prior_list, 56
- print.qbrms_prior_spec, 57
- print.qbrmsformula, 57
- print.summary.qbrms_fit, 58
- print.tmb_ordinal_qbrms_fit, 58
- prior, 59
- prior_build_from_beliefs, 54, 59
- prior_code, 60
- prior_exponential (exponential), 27
- prior_pp_diagnostics, 61
- prior_pp_summary, 62
- prior_predictive_check, 63
- prior_to_posterior_workflow, 64
- priors, 64
- qbrm, 65
- qbrmb, 66, 67, 68
- qbrmb_aggressive, 67
- qbrmb_regularised, 68
- qbrm0, 68, 70
- qbrms, 5, 66, 69
- qbrms-model-criteria, 70
- qbrms-package, 5
- qbrms_bayesian_analysis, 71
- qbrms_binomial_regularised, 71
- qbrms_emmeans, 72
- qbrms_fit_log, 73
- qbrms_ordinal_binary, 73
- qbrms_set_verbosity, 74
- quick_density_comparison, 74
- random_walk_families, 75
- residuals.qbrms_fit, 75
- rope_analysis, 76
- rw1 (random_walk_families), 75
- rw2 (random_walk_families), 75
- simplex, 76
- skew_normal, 77
- student (student_t), 77
- student_t, 77
- student_t_prior (student_t), 77
- summary.qbrmb_fit, 79
- summary.qbrms_fit, 79
- summary.qbrms_multinomial_fit, 80
- summary.qbrms_p_significance, 81
- summary.tmb_ordinal_qbrms_fit, 81
- tab_model, 82
- test_corrected_bayes_R2, 83
- uniform, 84
- validate_family_quantile, 85
- vcov.qbrms_fit, 85
- vcov.tmb_ordinal_qbrms_fit, 86
- view_table, 86
- visualise_prior, 87
- von_mises (circular_normal), 13
- waic (qbrms-model-criteria), 70
- weibull, 88
- zero_inflated_negbinomial, 89
- zero_inflated_poisson, 89
- zinb (zero_inflated_negbinomial), 89
- zip (zero_inflated_poisson), 89