

# Package ‘LogicForest’

January 20, 2025

**Title** Logic Forest

**Version** 2.1.1

**Depends** R (>= 2.10)

**Imports** LogicReg, methods

**Suggests** data.table, knitr, rmarkdown

## Description

Two classification ensemble methods based on logic regression models. `LogForest()` uses a bagging approach to construct an ensemble of logic regression models. `LBoost()` uses a combination of boosting and cross-validation to construct an ensemble of logic regression models. Both methods are used for classification of binary responses based on binary predictors and for identification of important variables and variable interactions predictive of a binary outcome. Wolf, B.J., Slate, E.H., Hill, E.G. (2010) <[doi:10.1093/bioinformatics/btq354](https://doi.org/10.1093/bioinformatics/btq354)>.

**License** GPL-3

**Encoding** UTF-8

**RoxygenNote** 7.3.1

**VignetteBuilder** knitr

**NeedsCompilation** no

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**Repository** CRAN

**Date/Publication** 2024-03-13 11:20:08 UTC

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LF.data	<i>LF.data</i>
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**Description**

A data frame containing 200 observations and 52 variables with value 0 or 1.

**Details**

Simulated binary data for logic forest example

**Author(s)**

Bethany Wolf <wolf@musc.edu>

**References**

<https://github.com/cran/LogicForest/blob/master/data/LF.data.rda>

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logforest	<i>Logic Forest</i>
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**Description**

Constructs an ensemble of logic regression models using bagging for classification and identification of important predictors and predictor interactions

**Usage**

```
logforest(resp, Xs, nBSXVars, anneal.params, nBS=100, h=0.5, norm=TRUE, numout=5, nleaves)
```

**Arguments**

resp	numeric vector of binary response values
Xs	matrix or dataframe of zeros and ones for all predictor variables
nBSXVars	integer for the number of predictors used to construct each logic regression model. The default value is all predictors in the data.
anneal.params	a list containing the parameters for simulated annealing. See the help file for the function <code>logreg.anneal.control</code> in the <code>LogicReg</code> package. If missing, default annealing parameters are set at <code>start=1</code> , <code>end=-2</code> , and <code>iter=50000</code> .
nBS	number of logic regression trees to be fit in the logic forest model.
h	a number between 0 and 1 for the minimum proportion of trees in the logic forest that must predict a 1 for the prediction to be one.
norm	logical. If <code>FALSE</code> , predictor and interaction scores in model output are not normalized to range between zero and one.
numout	number of predictors and interactions to be included in model output
nleaves	the maximum number of end nodes generated for each tree

*logforest*

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**Value**

An object of class "logforest" including a list of values

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