Package ‘mcbiopi’

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Title  Matrix Computation Based Identification of Prime Implicants
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Imports  methods
Description  Computes the prime implicants or a minimal disjunctive normal form for a logic expression presented by a truth table or a logic tree. Has been particularly developed for logic expressions resulting from a logic regression analysis, i.e. logic expressions typically consisting of up to 16 literals, where the prime implicants are typically composed of a maximum of 4 or 5 literals.
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NeedsCompilation  no
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R topics documented:

  generateTruthTab .......................................................... 1
  minDNF ................................................................. 2
  prime.implicants ...................................................... 3

Index

\begin{itemize}
  \item \texttt{generateTruthTab} \hspace{1cm} \textit{Truth Table for a Logic Tree}
\end{itemize}

Description

Generates the truth table or the prime implicants, respectively, for a logic tree built in a logic regression,
Usage

generateTruthTab(ltree)

getPImps(ltree, type)

Arguments

ltree an object of class logregtree.

type the type of the logic regression model that has been fitted.

Author(s)

Holger Schwender, <holger.schwender@hu.de>

See Also

prime.implicants

minDNF Minimum Disjunctive Normal Form

Description

Computes the minimal disjunctive normal form for a given truth table.

Usage

minDNF(mat)

Arguments

mat a matrix containing only 0’s and 1’s. Each column of mat corresponds to a binary variable and each row to a combination of the variables for which the logic expression is TRUE.

Value

An object of class minDNF containing a vector comprising a minimized set of prime implicants. If more than one solution exist, then a list is returned containing all solutions.

Author(s)

Holger Schwender, <holger.schwender@hu.de>

References

See Also

prime.implicants

Examples

## Not run:
# Generate the truth table considered in Schwender (2007).

mat <- matrix(c(rep(0, 4), rep(1, 6),
               rep(0, 6), rep(1, 4),
               0, 0, 1, 1, 0, 1, 0, 0, 1, 1,
               0, 1, 0, 1, 1, 0, 1, 0, 1), ncol=4)
colnames(mat) <- paste("x", 1:4, sep="")

# Computing the minimal disjunctive normal form.

minDNF(mat)

## End(Not run)

prime.implicants  Prime Implicants

Description

Computes the prime implicants of a given truth table.

Usage

prime.implicants(mat)

Arguments

mat a matrix containing only 0's and 1's. Each column of mat corresponds to a binary variable and each row to a combination of the variables for which the logic expression is TRUE.

Value

An object of class primeImp containing a vector vec.primes comprising the prime implicants and a matrix mat.primes representing the prime implicant table.

Author(s)

Holger Schwender, <holger.schwender@hhu.de>
References


See Also

minDNF

Examples

```r
## Not run:
# Generate the truth table considered in Schwender (2007).

mat <- matrix(c(rep(0, 4), rep(1, 6),
                rep(0, 6), rep(1, 4),
                0, 0, 1, 1, 0, 1, 0, 1, 1,
                0, 1, 0, 1, 1, 1, 0, 1, 1), ncol=4)
colnames(mat) <- paste("x", 1:4, sep="")

# Determining the prime implicants.

prime.implicants(mat)

## End(Not run)
```
Index

*Topic logic
  generateTruthTab, 1
  minDNF, 2
  prime.implicants, 3
*Topic optimize
  minDNF, 2
*Topic print
  minDNF, 2
  prime.implicants, 3
*Topic utilities
  generateTruthTab, 1

evalTree (generateTruthTab), 1

generateTruthTab, 1
getPImps (generateTruthTab), 1

minDNF, 2, 4

prime.implicants, 2, 3, 3
print.minDNF (minDNF), 2
print.primeImp (prime.implicants), 3