Package ‘dsample’

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Type Package
Title Discretization-Based Direct Random Sample Generation
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Description Two discretization-based Monte Carlo algorithms, namely the Fu-Wang algorithm and the Wang-Lee algorithm, are provided for random sample generation from a high dimensional distribution of complex structure. The normalizing constant of the target distribution needs not to be known.
Depends R (>= 2.7.0)
Imports stats, graphics
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dsample Random Samples Generation Through The Wang-Lee and Fu-Wang Algorithms

Description
dsAMPLE.nwl generates a sample of specified size \( n \) from the target density function (up to a normalizing constant) based on the Wang-Lee algorithm.

Usage
dsampling(x, method = c("wl", "fw"), nc = 10000, n = 1000, wconst = NULL)

Arguments
- \( x \): must be a data.frame. See ‘Details’.
- method: \( \text{wl} \) (Wang-Lee), \( \text{fw} \) (Fu-Wang).
- nc: a positive integer, the number of contours. See ‘Details’.
- n: a non-negative integer, the desired sample size.
- wconst: a real number between 0 and 1. See ‘Details’.

Details
\( x \) has the number of rows equals to the number of discrete base points. In each row, the first element contains the functional value of the target density and the rest elements are the coordinates at which the density is evaluated.

wconst is a constant for adjusting the volume of the last contour.

Value
sample.nwl gives the drawn sample as a data.frame with number of rows equals the specified size \( n \) and number of columns equals \( \text{ncol}(x)-1 \).

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References
Examples

```r
## The following example is taken from West (1993, page 414).
## Journal of the Royal Statistical Society – B, 55, 409-422.

x1 <- runif(1e5)
x2 <- runif(1e5)
val <- (x1*(1-x2))^5 * (x2*(1-x1))^3 * (1-x1*(1-x2)-x2*(1-x1))^37
support <- as.data.frame(cbind(val, x1, x2))

summary(dsample(x=support, method="wl", nc=1e4, n=1e3))
summary(dsample(x=support, method="fw", nc=1e4, n=1e3))

## More accurate results can be achieved by increasing the number
## of discretization points and the number of contours.
```

# summary.dsample

## Generating Basic Summary Statistics of Marginal Distributions

### Description
Producing basic summary statistics (the mean, the standard deviation and the first five modes) from the sample drawn via either the Fu-Wang algorithm or the Wang-Lee algorithm, for all marginal distributions of the target distribution.

### Usage

```r
## S3 method for class 'dsample'
summary(object, n = 5, digits = 4, ...)
```

### Arguments

- `object` a `data.frame`, contains the sample drawn via either the Fu-Wang algorithm or the Wang-Lee algorithm
- `n` the first `n` samples
- `digits` a length of valid numbers
- `...` more arguments

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