Augment a Latin Hypercube Design

Description

Augments an existing Latin Hypercube Sample, adding points to the design, while maintaining the *latin* properties of the design.

Usage

```
augmentLHS(lhs, m=1)
```

Arguments

`lhs`	The Latin Hypercube Design to which points are to be added
`m`	The number of additional points to add to matrix `lhs`

Details

Augments an existing Latin Hypercube Sample, adding points to the design, while maintaining the *latin* properties of the design. Augmentation is perfomed in a random manner.

The algorithm used by this function has the following steps. First, create a new matrix to hold the candidate points after the design has been re-partitioned into *(n+m)^2* cells, where n is number of points in the original `lhs` matrix. Then randomly sweep through each column (1...`k`) in the repartitioned design to find the missing cells. For each column (variable), randomly search for an empty row, generate a random value that fits in that row, record the value in the new matrix. The new matrix can contain more filled cells than `m` unles *m = 2n*, in which case the new matrix will contain exactly `m` filled cells. Finally, keep only the first m rows of the new matrix. It is guaranteed to have `m` full rows in the new matrix. The deleted rows are partially full. The additional candidate points are selected randomly due to the random search for empty cells.

Value

An `n` by `k` Latin Hypercube Sample matrix with values uniformly distributed on [0,1]

Author(s)

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References

Stein, M. (1987) Large Sample Properties of Simulations Using Latin Hypercube Sampling. *Technometrics*. **29**, 143–151.

See Also

randomLHS, geneticLHS, improvedLHS, maximinLHS, and optimumLHS to generate Latin Hypercube Samples. optAugmentLHS and optSeededLHS to modify and augment existing designs.

Examples

```
a <- randomLHS(4,3)
a
augmentLHS(a, 2)
```