Package 'stratvns'

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Type Package

Title Optimal Stratification in Stratified Sampling Optimization Algorithm

Version 1.0

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Description An Optimization Algorithm Applied
to stratification Problem.
It is aims to delimit the population strata
and defining the allocation of sample,considering
the following objective: minimize the sample size given
a fixed precision level. Exhaustive enumeration method
is applied in small problems, while in problems with greater
complexity the algorithm is based on metaheuristic Variable
Neighborhood Decomposition Search with Path Relink.

Depends Rglpk,snowfall,stratification, sampling, MultAlloc

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EVP *Optimization Algorithm to solve stratification problem*

Description

An Optimization Algorithm Applied to Univariate Stratification Problem. It's aims to delimit the population strata and defining the allocation of sample, considering the following objective: minimize the sample size given a fixed precision level. Exhaustive enumeration method is applied in small problems, while in problems with greater complexity the algorithm is based on metaheuristics Variable Neighborhood Decomposition Search with Path-Relinking.

Usage

```
EVP(X, L, cv, nhmin = 1, Nmin = 2, imax = 150, tmax = 7, pmax = 5,
  notbest = 25, range_s = 30, range_b = 20, cpu_time = 5000,
  cores = 2)
```

Arguments

X	Values of the population associated with stratification variable.
L	Number of strata.
cv	Value with target cv associated with stratification variable, between 0 and 1.
nhmin	Smallest possible sample size in any stratum. The default is 1.
Nmin	Smallest possible population size in any stratum. The default is 2.
imax	Maximum number of iterations. The default is 150.
tmax	Maximum number neighbors. The default is 7.
pmax	Maximum number of solutions - pool. The default is 5.
notbest	Maximum number of iterations without improvement. The default is 25.
range_s	Shaking interval. The default is 30.
range_b	Search interval. The default is 20.
cpu_time	Maximum cpu time. The default is 5000.
cores	Numerical amount of CPUs requested for the cluster. The default is 2.

Value

TYPE	Type of solution. If the solution was obtained by the exact method returns "GLOBAL OPTIMA" else the solution was obtained by the metaheuristic method returns "LOCAL OPTIMA".
bh	Strata boundaries.
Nh	Population size in each stratum.
n	Total sample size.

nh	Sample size in each stratum.The last one is a take-all stratum, then sample size equal to population size.
cv	Estimated coefficient of variation for the estimator of total of the stratification variable.
cputime	Time consumed by the algorithm in seconds.

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References

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Hansen, P.; Mladenovic, N.; Perez-Brito, D. (2001). Variable Neighborhood Decomposition Search. Journal of Heuristics 7.4, pp. 335-350.

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Examples

```
data(Sweden)
P75<-Sweden[,3]
solution1<-EVP(P75,L=2,cv=0.1,nhmin=5,imax=50,cores=2)
solution2<-EVP(P75,L=6,cv=0.1,cores=2,imax=25)
```

Index