Package 'HierPortfolios'

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Type Package

Title Hierarchical Clustering-Based Portfolio Allocation Strategies

Version 0.1.0

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Description Machine learning portfolio allocation strategies based on hierarchical clustering methods.
The implemented methods are:
Hierarchical risk parity (De Prado, 2016) <DOI:10.3905/jpm.2016.42.4.059> and
Hierarchical clustering-based asset allocation (Raffinot, 2017)
<DOI:10.3905/jpm.2018.44.2.089>.

License GPL-2

Depends R (>= 3.6.0)

Imports fastcluster, cluster, RiskPortfolios

Encoding UTF-8

LazyData true

RoxygenNote 7.1.1

URL https://github.com/ctruciosm/HierPortfolios

BugReports https://github.com/ctruciosm/HierPortfolios/issues

NeedsCompilation no

Repository CRAN

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R topics documented:

`daily_returns`	*Daily returns (in percentage) of 15 assets.*

Description

Dataset used to illustrate how to use the portfolio allocation strategies implemented in this package.

`HCAA_Portfolio`	*Hierarchical Clustering-Based Asset Allocation*

Description

Performs the Hierarchical Clustering-Based Asset Allocation strategy proposed by Raffinot (2017). Several linkage methods for the hierarchical clustering can be used, by default the "ward" linkage is used. The numbers of clusters is selected using the Gap index of Tibshirani et al. (2001).

Usage

```
HCAA_Portfolio(covar, linkage = "ward", graph = FALSE, clusters = NULL)
```

Arguments

`covar`	Covariance matrix of returns. The covariance matrix will be transformed into correlation matrix and then into a distance matrix.
`linkage`	Linkage method used in the hierarchical clustering. Allowed options are "single", "complete", "average" or "ward". Default option is "ward".
`graph`	To plot de dendrogram set this value to TRUE. By default this value is equal to FALSE.
`clusters`	Numbers of clusters. If NULL (default), the gap index is applied.

Value

portfolio weights.

References

Raffinot, Thomas. "Hierarchical clustering-based asset allocation." The Journal of Portfolio Management 44.2 (2017): 89-99.

Tibshirani, Robert, Guenther Walther, and Trevor Hastie. "Estimating the number of clusters in a data set via the gap statistic." Journal of the Royal Statistical Society: Series B (Statistical Methodology) 63.2 (2001): 411-423.

See Also

HRP_Portfolio

Examples

```
covar <- cov(daily_returns)
HCAA_Portfolio(covar)
```

HRP_Portfolio   *Hierarchical Risk Parity*

Description

Performs the Hierarchical Risk Parity portfolio proposed strategy by De Prado (2016). Several linkage methods for the hierarchical clustering can be used, by default the "single" linkage is used.

Usage

```
HRP_Portfolio(covar, linkage = "single", graph = FALSE)
```

Arguments

covar	Covariance matrix of returns. The covariance matrix will be transformed into correlation matrix and then into a distance matrix.
linkage	Linkage method used in the hierarchical clustering. Allowed options are "single", "complete", "average" or "ward". Default option is "single".
graph	To plot de dendrogram set this value to TRUE. By default this value is equal to FALSE.

Value

portfolio weights

References

De Prado, Marcos Lopez. "Building diversified portfolios that outperform out of sample." The Journal of Portfolio Management 42.4 (2016): 59-69.

See Also

```
HCAA_Portfolio
```

Examples

```
covar <- cov(mldp_returns)
HRP_Portfolio(covar)
```

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mldp_returns   *Returns of 10 simulated assets.*

Description

This dataset contains the simulated returns used in the numerical example of Marcos Lopez de Prado's paper, hence the name `mldp_returns`. The Python code used to reproduce this simulated data is kindly provided by the author in the supplementary material of his paper.

References

De Prado, Marcos Lopez. "Building diversified portfolios that outperform out of sample." The Journal of Portfolio Management 42.4 (2016): 59-69.

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