**Application**

**Description**

Application data set

**Usage**

```r
data("Application")
```

**Format**

The format is: int [1:48, 1:15] 6 9 7 5 6 7 9 9 4 ... - attr(*, "dimnames")=List of 2 ..$ : NULL ..$

: chr [1:15] "FL" "APP" "AA" "LA" ...

**Details**

It is the scoring of 15 indicators on 48 interviewees

**Examples**

```r
data(Application)
## maybe str(Application) ; plot(Application) ...
```

---

**DLPCA**

**Distributed local PCA**

**Description**

Calculate the estimator on the DLPCA method

**Usage**

```r
DLPCA(X = X, n = n, p = p, m = m, K = K, L = L)
```

**Arguments**

- **X** is the original data matrix
- **n** is the sample size
- **p** is the number of variables
- **m** is the number of eigenvalues
- **K** is the number of nodes
- **L** is the number of subgroups
Value

- **time** is the time cost
- **V** is the right singular matrix
- **Vm** is the m-right singular matrix
- **Smean** is the mean covariance matrix
- **MMSER** is the mean MSE values of the robust covariance matrix sub-estimators
- **MSES** is the mean MSE values of the covariance matrix sub-estimators
- **MMSEX** is the mean MSE values of the sub-estimators of the matrix X
- **MSER** is the min MSE values of the robust covariance matrix sub-estimators
- **MSES** is the min MSE values of the covariance matrix sub-estimators
- **MSEX** is the min MSE values of the sub-estimators of the matrix X
- **wMSER** is the location of the min MSE values of the robust covariance matrix sub-estimators
- **wMSES** is the location of the min MSE values of the covariance matrix sub-estimators
- **wMSEX** is the location of the min MSE values of the sub-estimators of the matrix X
- **sigm** is the estimator of the covariance matrix of the matrix X

Examples

```r
data(Application)
X=Application
n=nrow(Application);p=ncol(Application)
m=5;L=4;K=4
DLPCA_result=DLPCA(X=X,n=n,p=p,m=m,K=K,L=L)
```

## Description

Gas-Turbine CO and NOx Emission Data in 2011

## Usage

```r
data("gt2011")
```
Format

A data frame with 7411 observations on the following 11 variables.

AT    a numeric vector
AP    a numeric vector
AH    a numeric vector
AFDP  a numeric vector
GTEP  a numeric vector
TIT   a numeric vector
TAT   a numeric vector
TEY   a numeric vector
CDP   a numeric vector
CO    a numeric vector
NOX   a numeric vector

Details

The dataset contains 36733 instances of 11 sensor measures aggregated over one hour, from a gas turbine located in Turkey for the purpose of studying flue gas emissions, namely CO and NOx.

Source

Heysem Kaya, Department of Information and Computing Sciences, Utrecht University, 3584 CC, Utrecht, The Netherlands

Examples

data(gt2011)

data(gt2012)  

Gas-Turbine CO and NOx Emission Data

Description

Gas-Turbine CO and NOx Emission Data in 2012

Usage

data("gt2012")
Format

A data frame with 7628 observations on the following 11 variables.

- **AT**: a numeric vector
- **AP**: a numeric vector
- **AH**: a numeric vector
- **AFDP**: a numeric vector
- **GTEP**: a numeric vector
- **TIT**: a numeric vector
- **TAT**: a numeric vector
- **TEY**: a numeric vector
- **CDP**: a numeric vector
- **CO**: a numeric vector
- **NOX**: a numeric vector

Details

The dataset contains 36733 instances of 11 sensor measures aggregated over one hour, from a gas turbine located in Turkey for the purpose of studying flue gas emissions, namely CO and NOx.

Source

Heysem Kaya, Department of Information and Computing Sciences, Utrecht University, 3584 CC, Utrecht, The Netherlands

Examples

data(gt2012)
**Format**

A data frame with 7152 observations on the following 11 variables.

- **AT** a numeric vector
- **AP** a numeric vector
- **AH** a numeric vector
- **AFDP** a numeric vector
- **GTEP** a numeric vector
- **TIT** a numeric vector
- **TAT** a numeric vector
- **TEY** a numeric vector
- **CDP** a numeric vector
- **CO** a numeric vector
- **NOX** a numeric vector

**Details**

The dataset contains 36733 instances of 11 sensor measures aggregated over one hour, from a gas turbine located in Turkey for the purpose of studying flue gas emissions, namely CO and NOx.

**Source**

Heysem Kaya, Department of Information and Computing Sciences, Utrecht University, 3584 CC, Utrecht, The Netherlands

**Examples**

```r
data(gt2013)
```

---

**gt2014**

*Gas-Turbine CO and NOx Emission Data*

---

**Description**

Gas-Turbine CO and NOx Emission Data in 2014

**Usage**

```r
data("gt2014")
```
gt2015

Format

A data frame with 7158 observations on the following 11 variables.

AT  a numeric vector
AP  a numeric vector
AH  a numeric vector
AFDP a numeric vector
GTEP a numeric vector
TIT  a numeric vector
TAT  a numeric vector
TEY  a numeric vector
CDP  a numeric vector
CO   a numeric vector
NOX  a numeric vector

Details

The dataset contains 36733 instances of 11 sensor measures aggregated over one hour, from a gas turbine located in Turkey for the purpose of studying flue gas emissions, namely CO and NOx.

Source

Heysem Kaya, Department of Information and Computing Sciences, Utrecht University, 3584 CC, Utrecht, The Netherlands

Examples

data(gt2014)

gt2015  Gas-Turbine CO and NOx Emission Data

Description

Gas-Turbine CO and NOx Emission Data in 2015

Usage

data("gt2015")
**Format**

A data frame with 7384 observations on the following 11 variables.

- AT  a numeric vector
- AP  a numeric vector
- AH  a numeric vector
- AFDP  a numeric vector
- GTEP  a numeric vector
- TIT  a numeric vector
- TAT  a numeric vector
- TEY  a numeric vector
- CDP  a numeric vector
- CO  a numeric vector
- NOX  a numeric vector

**Details**

The dataset contains 36733 instances of 11 sensor measures aggregated over one hour, from a gas turbine located in Turkey for the purpose of studying flue gas emissions, namely CO and NOx.

**Source**

Heysem Kaya, Department of Information and Computing Sciences, Utrecht University, 3584 CC, Utrecht, The Netherlands

**Examples**

```r
data(gt2015)
```

```
 Iris    Iris
```

**Description**

Iris data set

**Usage**

```r
data("Iris")
```
**Format**

A data frame with 150 observations on the following 5 variables.

- Sepal.length a numeric vector
- Sepal.width a numeric vector
- Petal.length a numeric vector
- Petal.width a numeric vector
- Species a character vector

**Details**

It contains 150 samples with 5 variables

**Source**

Gaspar peninsula in Canada

**Examples**

```r
data(Iris)
## maybe str(Iris) ; plot(Iris) ...
```

**Description**

Caculate the MSE value on PCA

**Usage**

```r
MSEpca(V = V, X = X, n = n, p = p, m = m, K = K, L = L)
```

**Arguments**

- \(V\) is the right singular matrix
- \(X\) is the original data set
- \(n\) is the sample size
- \(p\) is the number of variables
- \(m\) is the number of eigenvalues
- \(K\) is the number of nodes
- \(L\) is the number of subgroups

**Value**

\(\text{MSEpca}\) the MSE value on PCA
Examples

data(Application)
X=Application
n=nrow(Application);p=ncol(Application)
m=5;L=4;K=4
DLPCA_result=DLPCA(X=X,n=n,p=p,m=m,K=K,L=L)
V=DLPCA_result$V
MSEpca_result=MSEpca(V=V,X,n=n,p=p,m=m,K=K,L=L)
MSE_PCA=MSEpca_result$MSEpca
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