Package ‘NMFN’

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Title Non-negative Matrix Factorization
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NMFN-package .................................................. 2
distance2 .................................................. 3
mpinv .................................................. 4
nnmf .................................................. 4
nnmf_als .................................................. 5
nnmf_mm .................................................. 6
nnmf_prob .................................................. 7

Index 8
NMFN-package

Non-negative Matrix Factorization - Overview

Description

Non-negative Matrix Factorization

Details
### distance2

**Euclidean Distance between two matrices**

#### Description

Euclidean Distance between two matrices

#### Usage

`distance2(x1, x2)`

#### Arguments

- `x1`: Matrix 1
- `x2`: Matrix 2
Author(s)
Suhai (Timothy) Liu

Examples
X <- matrix(1:12, 3, 4)
Y <- matrix(5:16, 3, 4)
distance2(X, Y)

mpinv
Moore-Penrose Inverse

Description
Moore-Penrose Inverse

Usage
mpinv(X)

Arguments
X original matrix

Author(s)
Torsten Hothorn

Examples
X <- matrix(1:12, 3, 4)
m.inv = mpinv(X)

nmmf
Non-negative Matrix Factorization

Description
Non-negative Matrix Factorization

Usage
nmmf(x, k, method = "nmmf_mm", maxiter = 1000, eps = 2.2204e-16)
Arguments

- `x`: original input matrix
- `k`: number of factors / components
- `method`: which method to use for matrix factorization (default - multiplicative update)
- `maxiter`: max number of iterations
- `eps`: small threshold value

Author(s)

Suhai (Timothy) Liu

Examples

```r
X <- matrix(1:12,3,4)
z.mm <- nnmf(X,3)  # 3 factors via multiplicative update
z.als <- nnmf(X,3,'nnmf_als')  # 3 factors via alternating least square
z.prob <- nnmf(X,3,'nnmf_prob')  # 3 factors via multinomial
```

Description

Non-negative Matrix Factorization via alternating least squares method

Usage

```r
nnmf_als(x, k, maxiter, eps)
```

Value

- `W, H`: returned decomposed matrices

Author(s)

Suhai (Timothy) Liu
**Examples**

```r
X <- matrix(1:12, 3, 4)
results <- nnmf(X, 2, 'nnmf_als')
```

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**nnmf_mm**  
*Non-negative Matrix Factorization via multiplicative update*

**Description**

Non-negative Matrix Factorization - multiplicative update method

**Usage**

```r
nnmf_mm(x, k, maxiter, eps)
```

**Arguments**

- `x`: original input matrix
- `k`: number of factors / components
- `maxiter`: max number of iterations
- `eps`: small threshold value

**Value**

`W, H` - returned decomposed matrices

**Author(s)**

Suhai (Timothy) Liu

**References**

Lee and Sung 2001

**Examples**

```r
X <- matrix(1:12, 3, 4)
results <- nnmf(X, 2)
#which is equivalent to
results <- nnmf(X, 2, 'nnmf_mm')
```
**Description**

Non-negative Matrix Factorization - multinomial method

**Usage**

```r
nnmf_prob(x, k, maxiter, eps)
```

**Arguments**

- `x`: original input matrix
- `k`: number of factors / components
- `maxiter`: max number of iterations
- `eps`: small threshold value

**Value**

W, H - returned decomposed matrices

**Author(s)**

Suhai (Timothy) Liu

**Examples**

```r
X <- matrix(1:12, 3, 4)
results <- nnmf(X, 5, 'nnmf_prob')
```
Index

*Topic non-negative matrix factorization, multiplicative update, alternating least squares, multinomial

NMFN-package, 2

distance2, 3

mpinv, 4

NMFN (NMFN-package), 2
NMFN-package, 2

nnmf, 4
nnmf_als, 5
nnmf_mm, 6
nnmf_prob, 7