Package 'SolveRationalMatrixEquation'

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Type Package

Title Solve Rational Matrix Equation

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Description Given a symmetric positive definite matrix Q and a non-
singular matrix L, find symmetric positive definite solution X such that X = Q + L (X inv) L^T.
Reference: Benner, P., Faßbender, H. On the Solution of the Rational Matrix Equation.
Benner, Faßbender (2007) <doi:10.1155/2007/21850>.

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Encoding UTF-8

RoxygenNote 6.1.0

Suggests knitr, rmarkdown

VignetteBuilder knitr

NeedsCompilation no

Repository CRAN

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R topics documented:

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LQdecompose   *LQ Decomposition*

Description

Decompose a matrix into a Lower triangular matrix L and an orthogonal matrix Q

Usage

```
LQdecompose(mat)
```

Arguments

mat   a matrix of real numbers

Value

list containing L and Q matrices

Examples

```
LQdecompose(rbind(c(2,-2,18),c(2,1,0),c(1,2,0)))
```

QRdecompose   *QR Decomposition*

Description

Decompose a matrix into an orthogonal matrix Q and Upper triangular matrix R

Usage

```
QRdecompose(mat)
```

Arguments

mat   a matrix of real numbers

Value

list containing Q and R matrices

Examples

```
QRdecompose(rbind(c(2,-2,18),c(2,1,0),c(1,2,0)))
```

sol.rationalmatrix.euqation

Solve Rational Matrix Equation

Description

Given a symmetrix positive definite matrix Q and a non-singular matrix L, Find symmetric positive definite solution X such that $X = Q + L (X inv) L^T$

Usage

```
sol.rationalmatrix.euqation(Q, L, num_iterations = 50)
```

Arguments

Q	a symmetrix postive definite matrix of real numbers
L	a non-singular matrix of real numbers
num_iterations	Number of iterations to run for convergence

Value

X : solution to the equation $X = Q + L (X inv) L^T$

Examples

```
sol.rationalmatrix.euqation(matrix(c(2,-1,-1,2), 2, 2), rbind(c(2,3),c(2,1)))
```

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