

ctrfs.f(3)

LAPACK

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NAME

ctrfs.f –

SYNOPSIS**Functions/Subroutines**

subroutine **ctrfs** (UPLO, TRANS, DIAG, N, NRHS, A, LDA, B, LDB, X, LDX, FERR, BERR, WORK, RWORK, INFO)
CTRRFS

Function/Subroutine Documentation

subroutine **ctrfs** (characterUPLO, characterTRANS, characterDIAG, integerN, integerNRHS, complex, dimension(lda, *)A, integerLDA, complex, dimension(ldb, *)B, integerLDB, complex, dimension(ldx, *)X, integerLDX, real, dimension(*)FERR, real, dimension(*)BERR, complex, dimension(*)WORK, real, dimension(*)RWORK, integerINFO)
CTRRFS

Purpose:

CTRRFS provides error bounds and backward error estimates for the solution to a system of linear equations with a triangular coefficient matrix.

The solution matrix X must be computed by CTRTRS or some other means before entering this routine. CTRRFS does not do iterative refinement because doing so cannot improve the backward error.

Parameters:*UPLO*

UPLO is CHARACTER*1
 = 'U': A is upper triangular;
 = 'L': A is lower triangular.

TRANS

TRANS is CHARACTER*1
 Specifies the form of the system of equations:
 = 'N': $A * X = B$ (No transpose)
 = 'T': $A^{**T} * X = B$ (Transpose)
 = 'C': $A^{**H} * X = B$ (Conjugate transpose)

DIAG

DIAG is CHARACTER*1
 = 'N': A is non-unit triangular;
 = 'U': A is unit triangular.

N

N is INTEGER
 The order of the matrix A. $N \geq 0$.

NRHS

NRHS is INTEGER
 The number of right hand sides, i.e., the number of columns of the matrices B and X. $NRHS \geq 0$.

A

A is COMPLEX array, dimension (LDA,N)
 The triangular matrix A. If UPLO = 'U', the leading N-by-N upper triangular part of the array A contains the upper triangular matrix, and the strictly lower triangular part of A is not referenced. If UPLO = 'L', the leading N-by-N lower triangular part of the array A contains the lower triangular matrix, and the strictly upper triangular part of A is not



referenced. If `DIAG = 'U'`, the diagonal elements of `A` are also not referenced and are assumed to be 1.

LDA

`LDA` is `INTEGER`

The leading dimension of the array `A`. `LDA` \geq `max(1,N)`.

B

`B` is `COMPLEX` array, dimension (`LDB,NRHS`)

The right hand side matrix `B`.

LDB

`LDB` is `INTEGER`

The leading dimension of the array `B`. `LDB` \geq `max(1,N)`.

X

`X` is `COMPLEX` array, dimension (`LDX,NRHS`)

The solution matrix `X`.

LDX

`LDX` is `INTEGER`

The leading dimension of the array `X`. `LDX` \geq `max(1,N)`.

FERR

`FERR` is `REAL` array, dimension (`NRHS`)

The estimated forward error bound for each solution vector `X(j)` (the `j`-th column of the solution matrix `X`).

If `XTRUE` is the true solution corresponding to `X(j)`, `FERR(j)` is an estimated upper bound for the magnitude of the largest element in `(X(j) - XTRUE)` divided by the magnitude of the largest element in `X(j)`. The estimate is as reliable as the estimate for `RCOND`, and is almost always a slight overestimate of the true error.

BERR

`BERR` is `REAL` array, dimension (`NRHS`)

The componentwise relative backward error of each solution vector `X(j)` (i.e., the smallest relative change in any element of `A` or `B` that makes `X(j)` an exact solution).

WORK

`WORK` is `COMPLEX` array, dimension (`2*N`)

RWORK

`RWORK` is `REAL` array, dimension (`N`)

INFO

`INFO` is `INTEGER`

= 0: successful exit

< 0: if `INFO = -i`, the `i`-th argument had an illegal value

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Definition at line 182 of file `ctrfs.f`.



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