

NAME

SGETRF - computes an LU factorization of a general M-by-N matrix A using partial pivoting with row interchanges

SYNOPSIS

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SUBROUTINE SGETRF(
    M, N, A, LDA, IPIV, INFO )
    INTEGER    INFO, LDA, M, N
    INTEGER    IPIV( * )
    REAL       A( LDA, * )

```

PURPOSE

SGETRF computes an LU factorization of a general M-by-N matrix A using partial pivoting with row interchanges. The factorization has the form

$$A = P * L * U$$

where P is a permutation matrix, L is lower triangular with unit diagonal elements (lower trapezoidal if $m > n$), and U is upper triangular (upper trapezoidal if $m < n$).

This is the right-looking Level 3 BLAS version of the algorithm.

ARGUMENTS

- M** (input) INTEGER
The number of rows of the matrix A. $M \geq 0$.
- N** (input) INTEGER
The number of columns of the matrix A. $N \geq 0$.
- A** (input/output) REAL array, dimension (LDA,N)
On entry, the M-by-N matrix to be factored. On exit, the factors L and U from the factorization $A = P * L * U$; the unit diagonal elements of L are not stored.
- LDA** (input) INTEGER
The leading dimension of the array A. $LDA \geq \max(1, M)$.
- IPIV** (output) INTEGER array, dimension (min(M,N))
The pivot indices; for $1 \leq i \leq \min(M, N)$, row i of the matrix was interchanged with row IPIV(i).
- INFO** (output) INTEGER
= 0: successful exit
< 0: if $INFO = -i$, the i-th argument had an illegal value
> 0: if $INFO = i$, $U(i, i)$ is exactly zero. The factorization has been completed, but the factor U is exactly singular, and division by zero will occur if it is used to solve a system of equations.