

NAME

iluk - level-k of the sparse incomplete lu factorization with dual truncation

CALLING SEQUENCE

[L,U,ierr]=iluk(A,lfil,elts)

PARAMETERS

A : sparse matrix (must be squared)
lfil : the fill-in parameter; The default of **lfil** is the average number of nonnull elements of the matrix **A** by lines
elts : maximal number of nonnull elements of the matrices **L** and **U**, without diagonal elements; The default of **elts** is always correct, but over-estimates a lot.
L : lower triangular sparse matrix
U : upper triangular sparse matrix
ierr : error flag

DESCRIPTION

Builds an incomplete LU factorization of the sparse matrix **A**. The two factors **L** and **U** are stored under a CSR format. The CSR format is the Compressed Sparse Row format used by Scilab.

All the diagonal elements of the input matrix must be nonzero.

lfil : each row of **L** and each row of **U** will have a maximum of **lfil** elements (excluding the diagonal element). **lfil** must be .ge. 0.

ierr : error flag

0 --> successful return.

>0 --> zero pivot encountered at step number ierr.

-1 --> error. input matrix may be wrong. (The elimination process has generated a row in **L** or **U** whose length is .gt. n.)

-2 --> storage of matrix **L** caused an overflow in array al.

-3 --> storage of matrix **U** caused an overflow in array alu.

-4 --> illegal value for **lfil**.

-5 --> zero row encountered in **A** or **U**.

EXAMPLE

```
A=mmread(SCILIN+'/tests/matrices/pde225.mtx')
n=size(A,1); b=ones(n,1);
lfil=10;
[L,U,ierr]=iluk(A,lfil);
x=U\ (L\b)
A*x-b
```

AUTHOR

Sparskit procedure interfaced by Aladin Group

SEE ALSO

ilu0, milu0, ilut, ilud, ilutp, iludp