MATRIX SPECTRAL NORM

PURPOSE

Compute the spectral norm of a matrix.

DESCRIPTION

The spectral norm of a matrix is the square root of the largest eigenvalue of the matrix times its transpose.

SYNTAX

LET <par> = MATRIX SPECTRAL NORM <mat1> <SUBSET/EXCEPT/FOR qualification>
where <mat1> is a matrix for which the spectral norm is to be computed;
<par> is a parameter where the spectral norm is saved;
and where the <SUBSET/EXCEPT/FOR qualification> is optional and rarely used in this context.

EXAMPLES

LET C = MATRIX SPECTRAL NORM A

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

MATRIX SPECTRAL RADIUS	=	Compute the matrix spectral radius.
MATRIX DETERMINANT	=	Compute a matrix determinant.
MATRIX EIGENVALUES	=	Compute the matrix eigenvalues.
MATRIX EUCLIDEAN NORM	=	Compute the matrix Euclidean norm.
SINGULAR VALUES	=	Compute the singular values of a matrix.

REFERENCE

“A First Course in Numerical Analysis,” 2nd ed., Ralston and Rabinowitz, 1978, McGraw-Hill.

APPLICATIONS

Linear Algebra

IMPLEMENTATION DATE

87/10

PROGRAM

```
READ MATRIX X
16 16 19 21 20 23
14 17 15 22 18 22
24 23 21 24 20 23
18 17 16 15 20 19
18 11 9 18 7 14
END OF DATA
LET SN = MATRIX SPECTRAL NORM X
```

The value 100.38is printed for the spectral norm.