

**stichting
mathematisch
centrum**



AFDELING NUMERIEKE WISKUNDE

ND 1/74

MARCH

J.D. ALANEN (ed.)
KWIC INDEX FOR CDC AND CERN MATHEMATICAL SOFTWARE
AVAILABLE ON THE SARA COMPUTER

2e boerhaavestraat 49 amsterdam

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Directions for use

The key word in context (KWIC) index is based upon program abstracts such as:

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F18HELP  FINDS ALL THE $ZEROS OF A $COMPLEX $POLYNOMIAL BY $LEHMERS
$METHOD USING $SCHURS $METHOD FOR ISOLATING ONE ZERO.
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The first nine characters ("F18HELP ") of each abstract are a code to identify the program, while the remaining characters until a period comprise a short description of the program (what it does and how it does it), only "important" words (preceded by a \$ in the above example) are used as key words in the KWIC index.

The first appearance of our above example abstract in the KWIC index is:

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FINDS ALL THE ZEROS OF A      COMPLEX POLYNOMIAL BY LEHMERS METHOD USING
SCHURS METHOD FOR ISOLATING ONE ZERO.                                F18HELP
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If this program is of interest, you can further identify it as follows: the first letter of the code is the programming language (F = Fortran, C = Compass). The next two digits are the literature reference number (18 = Math Science Library, vol. 8, Nonlinear equation solvers); a complete list of literature references is given below. The final six characters of the code are the name ("HELP" in the example) of the program.

In case an entry in the KWIC index is not completely readable (i.e. truncated at an end of the line), you can find a complete, alphabetical listing of all the abstracts following the KWIC index. In our example; you would first look under language "F", then reference "18", and lastly the program name "HELP"; the complete abstract would follow.

Literature

- [1] Matrix algebra subroutines general information manual, CDC pub. no. 60154800 (December 1965), 1-9.
- [2] Statistical subroutines reference manual, CDC pub. no. 60135300 (June 1966), 1-67.
Statistical subroutines general information manual, CDC pub. no. 60154700 (December 1965), 1-22.
- [3] CERN computer 6000 series program library: Classified list of programs available, amended 21.8.1971.
- [11] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 1, Programmed arithmetic.
- [12] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 2, Elementary functions.
- [13] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 3, Polynomials and special functions.
- [14] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 4, Ordinary differential equations.
- [15] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 5, Interpolation, approximation, and quadrature.
- [16] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 6, Linear algebra.
- [17] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 7, Probability, statistics, and time series.
- [18] Math Science Library, CDC pub. no. 60327500 (March 1971), vol. 8, Nonlinear equation solvers.

Acknowledgements

The following Mathematical Centre staff members contributed to the production of this KWIC index:

Jack Alanen organized the project and edited the abstracts.

A.C. IJsselstein wrote and ran the EL X8 computer program.

J. Kok abstracted the programs in [18].

P.W. Hemker abstracted the programs in [14] and [15].

W. Hoffmann abstracted the programs in [16].

N.M. Temme abstracted the programs in [13].

A.P.B.M. Vehmeyer abstracted the programs in [17].

D. Winter supplied and advised us on the use of his input/output, file and sort procedures which were written for another program.

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APPROXIMATION.
APPROXIMATION OF GIVEN DEGREE TO A DISCRETE DATA SET.
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APPROXIMATION TO A FUNCTION OF WHICH THE MACLAURIN EXPANSION IS GIVEN.
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ARITHMETIC TRANSFORMATIONS ON THE OBSERVATIONS OF TWO VARIABLES IN MULTIPLEXED ARRAYS,
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AVERAGE OF A SPECIFIED NUMBER OF OTHER POINTS IN ITS NEIGHBORHOOD,
BACKWARD RECURSION,
BACKWARD RECURSION WITH STARTING VALUES,
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JAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF EACH METHOD AND DEFLATING THE ORIGINA
BALANCED HESSENBERG MATRIX,
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F16BPDSON
F17BRTLTT
F12CBAREX
C12ALOG10
C12DLOG10
F16BPDFSB
F16BFBANP
F16BFBSUM
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EVALUATES THE
FORMATION; COULD BE USED FOR
NS OF A AND B, INTEGER, REAL,
THE EXPONENTIAL FUNCTION OF A
ES THE NATURAL LOGARITHM OF A
COMPUTES THE SQUARE ROOT OF A
THE FIRST OR SECOND KINDS FOR
THM OF THE GAMMA FUNCTION FOR
NERAL EXPONENTIATION C**R FOR
EVALUATES A POLYNOMIAL HAVING
COMPUTES THE
PRODUCT OF TWO VECTORS HAVING
RIER TRANSFORM OF AN ARRAY OF
REQUIRED NUMBER OF ZEROS OF A
REQUIRED NUMBER OF ZEROS OF A
BY THE NUMBER OF POLES, OF A
A GUESS OF AN EIGENVALUE TO A
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SOLVES A LINEAR SYSTEM FOR A
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NVALUES AND EIGENVECTORS OF A
REDUCES A
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CH IS THE INTEGRAL OF ANOTHER
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NDER OBTAINED BY DIVIDING ONE
NSLATION IN THE ARGUMENT OF A
DIVIDES A
REVERSES THE ORDER OF
ENTS OF THE DIFFERENCE OF TWO
PUTES THE COEFFICIENTS OF THE
IS THE DERIVATIVE OF ANOTHER
ERROR IN THE EVALUATION OF A
FINDS ALL THE ZEROS OF A
FINDS ALL THE ZEROS OF A
E ZEROS OR A SINGLE ZERO OF A
PERFORMS A SINGLE

COEFFICIENTS OF THE DERIVATIVE OF A FOURIER SERIES, GIVEN THE COEFFICIENTS OF THE TRIGONOMETRIC POLY
COEFFICIENTS OF THE FOURIER SERIES WITH A LINEAR TREND THAT IS OBTAINED BY INTEGRATION OF A TRIGONOM
COEFFICIENTS OF THE PADE APPROXIMATION TO A FUNCTION OF WHICH THE MACLAURIN EXPANSION IS GIVEN,
COEFFICIENTS OF THE CHEBYCHEFF POLYNOMIAL THAT GIVES A CLOSE APPROXIMATION TO A MINIMAX FIT OF A GIV
COEFFICIENTS OF A POLYNOMIAL WHICH IS THE DERIVATIVE OF ANOTHER POLYNOMIAL GIVEN THE COEFFICIENTS OF
COEFFICIENTS OF SKEWNESS AND KURTOSIS FOR MULTIPLEXED ARRAYS,
COEFFICIENTS OR THE AUTO VARIANCE COEFFICIENTS FOR ONE VARIABLE IN A MULTIPLEXED ARRAY,
COEFFICIENTS WITH NEWTONS METHOD OR BAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF E
COLUMN OR A ROW OF A MATRIX USING EITHER SINGLE OR DOUBLE PRECISION; OTHER SUBROUTINES ARE VIPA, VIP
COMMON FACTOR OF TWO INTEGERS BY EUCLIDS ALGORITHM,
COMMON MULTIPLE OF TWO INTEGERS BY USING SUBROUTINE HCF,
COMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND BY THE LANDEN TRANSFORMATION,
COMPLETE ELLIPTIC INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION,
COMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND SOMETIMES,
COMPLEX, AND DOUBLE PRECISION,
COMPLEX ARGUMENT,
COMPLEX ARGUMENT,
COMPLEX ARGUMENT,
COMPLEX ARGUMENT AND COMPLEX ORDER,
COMPLEX ARGUMENT BY USING CONTINUED FRACTIONS,
COMPLEX BASE AND REAL EXPONENT,
COMPLEX COEFFICIENTS AT A COMPLEX POINT BY SUMMING THE PRODUCT OF THE POWERS TIMES THE COEFFICIENTS,
COMPLEX COSINE TRIGONOMETRIC FUNCTION,
COMPLEX ELEMENTS,
COMPLEX FOURIER AMPLITUDES,
COMPLEX FUNCTION USING A METHOD DESCRIBED BY JARRATT AND NUDDS FOR APPROXIMATION OF ONE ZERO AND FAC
COMPLEX FUNCTION WITH MULLERS METHOD AND FACTORING OUT PREVIOUSLY FOUND ZEROS,
COMPLEX FUNCTION IN AN AREA IN THE COMPLEX PLANE ENCLOSED BY A POLYGON,
COMPLEX HESSENBERG MATRIX USING HYMAN'S METHOD TO EVALUATE THE DETERMINANT,
COMPLEX MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBR
COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION FOLLOWING CROUTS
COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION ACCORDING TO CROU
COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQ
COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS A
COMPLEX MATRIX BY A COMPLEX VECTOR,
COMPLEX MATRIX BY A COMPLEX VECTOR,
COMPLEX MATRIX BY MEANS OF QR ITERATION ON A SIMILAR BALANCED HESSENBERG MATRIX,
COMPLEX MATRIX TO HESSENBERG FORM USING A MODIFICATION OF HOUSEHOLDERS METHOD,
COMPLEX MATRIX BY MEANS OF DIAGONAL SIMILARITY TRANSFORMATIONS,
COMPLEX MATRIX USING QR ITERATION ON A SIMILAR HESSENBERG MATRIX FOR THE EIGENVALUES AND INVERSE ITE
COMPLEX NUMBERS ACCORDING TO EITHER DECREASING OR INCREASING MAGNITUDE IN A WAY WHICH IS NOT EFFICIE
COMPLEX ORDER,
COMPLEX POINT BY SUMMING THE PRODUCT OF THE POWERS TIMES THE COEFFICIENTS,
COMPLEX POINT BY FACTORIZING WITH A QUADRATIC TERM,
COMPLEX POLYNOMIALS,
COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
COMPLEX POLYNOMIAL BY A LINEAR FACTOR, X+B, WHERE B MAY BE COMPLEX,
COMPLEX POLYNOMIALS,
COMPLEX POLYNOMIAL BY ANOTHER,
COMPLEX POLYNOMIAL,
COMPLEX POLYNOMIAL BY A QUADRATIC EXPRESSION,
COMPLEX POLYNOMIAL COEFFICIENTS IN AN ARRAY,
COMPLEX POLYNOMIALS,
COMPLEX POLYNOMIAL P(AX) FROM THE COEFFICIENTS OF P(X),
COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
COMPLEX POLYNOMIAL NEAR ONE OF ITS ROOTS THROUGH FORWARD ERROR ANALYSIS,
COMPLEX POLYNOMIAL BY APPLYING STEEPEST DESCENT WITH ACCELERATION DEVICES AND USING EXPLICIT DEFLATI
COMPLEX POLYNOMIAL BY LEHMERS METHOD USING SCHURS METHOD FOR ISOLATING ONE ZERO,
COMPLEX POLYNOMIAL BY MULLERS METHOD WITH DEFLATION,
COMPLEX QR ITERATION ON A HESSENBERG MATRIX HAVING REAL SUBDIAGONAL ELEMENTS,

F15TRGDIF
F15TRGINT
F15PADE
F15CHEBAP
F15DERIV
F17DSCRPT
F17CORCOV
F18PROOT
C16VIP
F11HCF
F11LCM
F13CEL3
F13ELK
F13EL3
C12PS1132
C12CEXP
C12CLOG
C12CSGRT
F13COMBES
F13LOGGAM
F12CBAREX
F13CCOMPE
C12CCOS
F16CINPRD
F17HARM
F18ZAFUJ
F18ZAFUM
F18ZCOUNT
F16DTSHTF
F16CDECOM
F16CFBSUM
F16CGITRF
F16CGLESM
F16CITERF
C16FMVXC
C16FMTVCX
F16QREIGN
F16SUBDIA
F16BALANC
F16VALVEC
F16VECORO
F13COMBES
F13CCOMPE
F13CCOMPEV
F13CADR
F13CINT
F13CLDIV
F13CMPYR
F13CPDIV
F13CPTRAN
F13CODIV
F13CREV
F13CSBR
F13CSHRNK
F13CDERIV
F18CNLSVL
F18CPOLRT
F18HELP
F18MULLP
F16QR1

COEFFICIENTS NEAR ONE OF ITS COMPUTES THE
A LEAST SQUARES PROBLEM FOR A EVALUATES THE
MULTIPLY A COMPLEX MATRIX BY A TRANSPOSED COMPLEX MATRIX BY A
ANGES A VECTOR WITH FRACTIONAL TO SUBTRACT FROM A VECTOR ITS
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VIDES DATA FOR ESTIMATING THE VIDES DATA FOR ESTIMATING THE
STIMATING THE DETERMINANT AND STIMATING THE DETERMINANT AND
ETERMINANT AND ESTIMATING THE ETERMINANT AND ESTIMATING THE
EX SYSTEM USING THE METHOD OF EAST SQUARES ACCORDING TO THE
RECTANGULAR MATRIX USING THE TAIN MACHINE AND MATHEMATICAL
FOR COMPLEX ARGUMENT BY USING PERFORMS A SINGLE
CISSAS REQUIRED; SECOND ORDER EFFECTS A
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EVALUATES A
COMPUTES THE HYPERBOLIC COMPUTES THE
COMPUTES THE DOUBLE PRECISION COMPUTES THE COMPLEX
INTO TRIANGULAR FACTORS USING GULAR DECOMPOSITION FOLLOWING
AR DECOMPOSITION ACCORDING TO AR DECOMPOSITION ACCORDING TO
EVEAL RIGHT-HAND SIDES USING AR DECOMPOSITION ACCORDING TO
INTO TRIANGULAR FACTORS USING INTO TRIANGULAR FACTORS USING
INTO TRIANGULAR FACTORS USING RIANGULAR DECOMPOSITION USING
AR DECOMPOSITION ACCORDING TO AR DECOMPOSITION ACCORDING TO
PARTIAL PIVOTING ACCORDING TO PARTIAL PIVOTING ACCORDING TO
IGHT-HAND SIDES ACCORDING TO A LINEAR SYSTEM ACCORDING TO

COMPLEX ROOTS THROUGH FORWARD ERROR ANALYSIS.
COMPLEX SINE TRIGONOMETRIC FUNCTION.
COMPLEX SYSTEM USING THE METHOD OF CONJUGATE GRADIENT.
COMPLEX VALUED HANKEL FUNCTION FOR REAL ARGUMENT AND INTEGER ORDER BY SUMMATION OF SERIES FOR BESSEL
COMPLEX VECTOR.
COMPLEX VECTOR.
COMPONENTS INTO ONE WITH INTEGER COMPONENTS TIMES A SCALAR FUNCTION.
COMPONENT ALONG ANOTHER VECTOR.
CONDITION NUMBER.
CONDITION NUMBER.
CONDITION NUMBER.
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CONDITION NUMBER ARE AVAILABLE.
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CONDITION NUMBER OF THE MATRIX.
CONDITION NUMBER OF THE MATRIX.
CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CONDITION NUMBER AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CONDITION NUMBER AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CONDITION NUMBER.
CONDITION NUMBER.
CONDITION NUMBER OF THE MATRIX.
CONDITION NUMBER OF THE MATRIX.
CONJUGATE GRADIENT.
CONJUGATE GRADIENT METHOD.
CONJUGATE GRADIENT METHOD.
CONSTANTS AS SINGLE PRECISION NUMBERS OF MAXIMUM ACCURACY.
CONTINUED FRACTIONS.
CONTINUED FRACTION INTERPOLATION USING INVERTED DIFFERENCES ON TABULAR DATA WITH ARBITRARY SPACING.
CONTINUITY.
COORDINATE TRANSLATION IN THE ARGUMENT OF A REAL POLYNOMIAL.
COORDINATE TRANSLATION IN THE ARGUMENT OF A COMPLEX POLYNOMIAL.
CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS METHOD OF SUCCESSIVE SUBSTITUTION.
CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
CORRELATION COEFFICIENTS OR THE AUTO VARIANCE COEFFICIENTS FOR ONE VARIABLE IN A MULTIPLEXED ARRAY.
COSINE INTEGRALS USING CHEBYSHEV APPROXIMATIONS.
COSINE POLYNOMIAL AT A GIVEN POINT.
COSINE TRIGONOMETRIC FUNCTION.
COSINE TRIGONOMETRIC FUNCTION.
COSINE TRIGONOMETRIC FUNCTION.
COSINE TRIGONOMETRIC FUNCTION.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; ALSO COMPUTES ITS DETERMINANT.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBRO
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT; THE DETERMINANT A
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIM
CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE.
CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECO
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBRO
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT.
CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND CONDITIO
CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND CONDITIO
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.

F18NSLVL
C12CSIN
F16CCONGR
F13HANKEL
C16FMVX
C16FMTVX
F11FFRAC
C16FPUR
F16BITRNP
F16BITERM
F16BITRFM
F16BITWNP
F16CGITRF
F16CITERF
F16ITERFM
F16ITERFS
F16GITRFM
F16GITRFS
F16ITRPDM
F16ITRPDS
F16LITWNE
F16LITWNP
F16PDITRS
F16PDITRM
F16CCONGR
F16FCGM2
F16SCONG
F13AMCON
F13LOGGAM
F15ACFI
F15COMCUB
F13PTRAN
F13CPTRAN
F14BLCKDQ
F16GITRFM
F16GITRFS
F16ITRPDM
F16ITRPDS
F17CORCOV
F13SICI
F15COSEVL
F12COSH
C12COS
C12DCOS
C12CCOS
F16DCECOM
F16CFBSUM
F16CGITRF
F16CGLESF
F16CITERF
F16DCWNE
F16DCWNP
F16DECOM
F16DETERM
F16FBUBM
F16FBUBS
F16ITERFM
F16ITERFS
F16GLESOM
F16GLESOS

KYS METHOD FOR THE TRIANGULAR
KYS METHOD FOR THE TRIANGULAR
LINEAR SYSTEM USING CHOLESKY
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AND SIDES PROVIDED TRIANGULAR
ND SIDES PROVIDED TRIANGULAR
AR SYSTEM PROVIDED TRIANGULAR
AR SYSTEM USING CHOLESKY
HT-HAND SIDES USING CHOLESKYS
AND SIDES PROVIDED TRIANGULAR
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TEM PROVIDED SQUARE ROOT FREE
ES PROVIDED SQUARE ROOT FREE
DECOMPOSITION USING CHOLESKY
DECOMPOSITION USING CHOLESKY
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A MATRIX PROVIDED TRIANGULAR
AR SYSTEM PROVIDED TRIANGULAR
AND SIDES PROVIDED TRIANGULAR
SIDES PROVIDED THE TRIANGULAR
SIDES PROVIDED THE TRIANGULAR
SIDES PROVIDED THE TRIANGULAR
EAST SQUARES PROBLEM PROVIDED
ND SIDES PROVIDED TRIANGULAR
AR SYSTEM PROVIDED TRIANGULAR
EAST SQUARES PROBLEM PROVIDED
FINITE LINEAR SYSTEM PROVIDED
AL RIGHT-HAND SIDES PROVIDED
A TRIDIAGONAL MATRIX PROVIDED
A TRIDIAGONAL MATRIX PROVIDED
EEN CARRIED OUT BY SUBROUTINE
D OUT, POSSIBLY BY SUBROUTINE
X NUMBERS ACCORDING TO EITHER
S OF A SYMMETRIC, NONNEGATIVE
OD A REAL, SYMMETRIC POSITIVE
STEM FOR A SYMMETRIC POSITIVE
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STEM FOR A SYMMETRIC POSITIVE
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ERATIVE REFINEMENT A POSITIVE

DECOMPOSES A TRIDIAGONAL MATRIX INTO LOWER AND UPPER TRIANGULAR FACTORS USING PARTIAL PIVOTING,
DECOMPOSES A TRIDIAGONAL MATRIX INTO TRIANGULAR FACTORS WITHOUT PIVOTING,
DECOMPOSES BY GAUSSIAN ELIMINATION WITHOUT PIVOTING A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULA
DECOMPOSES BY GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION A REAL BANDMATRI
DECOMPOSES BY THE CHOLESKY METHOD A REAL, SYMMETRIC POSITIVE DEFINITE BANDMATRIX INTO UPPER AND LOWE
DECOMPOSITION,
DECOMPOSITION,
DECOMPOSITION,
DECOMPOSITION,
DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CAR
DFCOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CAR
DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CAR
DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CAR
DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND ESTIMATING THE CONDITION NUMBER
DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND ESTIMATING THE CONDITION NUMBER
DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT,
DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BCHSDC,
DECOMPOSITION FOLLOWING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIE
DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OU
DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OU
DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CARRIED OUT,
DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BDCWNP,
DECOMPOSITION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUB
DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE C
DECOMPOSITION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN EST
DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT,
DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES
DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES
DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT,
DECOMPOSITION WITH CHOLESKYS METHOD HAS BEEN CARRIED OUT AND PROVIDES DATA FOR ESTIMATING THE CONDI
DECOMPOSITION WITH CHOLESKYS METHOD HAS BEEN CARRIED OUT AND PROVIDES DATA FOR ESTIMATING THE CONDI
DECOMPOSITION WITH PARTIAL PIVOTING HAS BEEN CARRIED OUT,
DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT,
DECOM,
DECOM,
DECREASING OR INCREASING MAGNITUDE IN A WAY WHICH IS NOT EFFICIENT FOR A LARGE SET OF NUMBERS,
DEFINITE, NARROW BANDMATRIX USING THE METHOD OF INVERSE WIELANDT ITERATION WITH PERIODIC RAYLEIGH QU
DEFINITE BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS,
DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS MET
DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOS
DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS MET
DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOS
DEFINITE LINEAR SYSTEM PROVIDED DECOMPOSITION WITH CHOLESKYS METHOD HAS BEEN CARRIED OUT AND PROVIDE
DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED DECOMPOSITION WITH CHOLESKYS METHOD H
DEFINITE LINEAR SYSTEM PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,
DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BE
DEFINITE LINEAR SYSTEM USING CHOLESKY DECOMPOSITION,
DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY DECOMPOSITION,
DEFINITE LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CARRI
DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION USING CHOLE
DEFINITE LINEAR SYSTEM PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE
DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHO
DEFINITE LINEAR SYSTEM WITHOUT USING THE SQUARE ROOT ROUTINE,
DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTINE,
DEFINITE LINEAR SYSTEM USING SQUARE ROOT FREE DECOMPOSITION,

F16TRDCOM
F16TRDCNP
F16BDCWNP
F16BDECOM
F16BCHSDC
F16BPDITM
F16BPDOSM
F16PDLSSOS
F16PDLSSOM
F16CGITRF
F16CITERF
F16FBSUBM
F16FBSUBS
F16PDITRS
F16PDITRM
F16BITRPD
F16BPDFSB
F16CFBSSUM
F16ITRSPM
F16ITRSPS
F16PDSFBS
F16PDSFBM
F16DETERM
F16ITERIN
F16PDSFBS
F16PDSFBM
F16BFBANP
F16FBFSUM
F16BITRNP
F16BITERM
F16BSUBHT
F16ITERFM
F16ITERFS
F16ITRLSQ
F16ITRPDM
F16ITRPDS
F16TRDFBM
F16TRDSSUB
F16DETERM
F16FBSUBM
F16VECORD
F16BANEIG
F16BCHSDC
F16BITRPD
F16BPDITM
F16BPDFSB
F16BPDOSM
F16ITRPDM
F16ITRPDS
F16ITRSPM
F16ITRSPS
F16PDLSSOS
F16PDLSSOM
F16PDSFBS
F16PDSFBM
F16SPDFBM
F16SPDFBS
F16SPDOSM
F16SPDOSOS
F16SPITRM

ERATIVE REFINEMENT A POSITIVE COMPOSES A SYMMETRIC POSITIVE COMPOSES A SYMMETRIC POSITIVE ITERATION OF EACH METHOD AND NOMIAL BY MULLERS METHOD WITH ITH A STABLE, BAND-PRESERVING ON DEVICES AND USING EXPLICIT ONSTRUCTS A FIFTH OF A POLYNOMIAL WHICH IS THE OF A POLYNOMIAL WHICH IS THE ONSTRUCTS COEFFICIENTS OF THE OF A POLYNOMIAL WHICH IS THE AND SWITCHING TO THE STEEPEST LYNOMIAL BY APPLYING STEEPEST ILIBRATION; ALSO COMPUTES TS HYMANS METHOD TO EVALUATE THE ION HAS BEEN CARRIED OUT; THE IDES DATA FOR CALCULATING THE IDES DATA FOR CALCULATING THE VIDES DATA FOR ESTIMATING THE VIDES DATA FOR ESTIMATING THE VIDES DATA FOR ESTIMATING THE IDES DATA FOR CALCULATING THE IDES DATA FOR CALCULATING THE LOWER TRIANGULAR FACTORS; THE D IMPLICIT EQUILIBRATION; THE INATION WITHOUT PIVOTING; THE S USING CHOLESKYS METHOD; THE ITHOUT ROW EQUILIBRATION; THE GORITHM WITHOUT PIVOTING; THE NG AND ROW EQUILIBRATION; THE ITHOUT ROW EQUILIBRATION; THE GORITHM WITHOUT PIVOTING; THE ALCULATING A SQUARE ROOT; THE AND EXPONENT (BASE 2) OF THE SOLVES AN OVER COMPUTES MEANS, STANDARD EST DESCENT WITH ACCELERATION A COMPLEX MATRIX BY MEANS OF INTERPOLATION USING INVERTED PUTES THE COEFFICIENTS OF THE YSTEM OF FIRST ORDER ORDINARY YSTEM OF FIRST ORDER ORDINARY YSTEM OF FIRST ORDER ORDINARY SOLVES RY VALUE PROBLEMS IN ORDINARY BLEMS IN A SYSTEM OF ORDINARY ENSYSTEM FOR THE SECOND ORDER

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DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION, DEFINITE MATRIX INTO TRIANGULAR FACTORS USING CHOLESKYS METHOD; THE DETERMINANT IS AVAILABLE, DEFINITE MATRIX INTO LOWER TRIANGULAR, DIAGONAL AND UPPER TRIANGULAR FACTORS WITHOUT CALCULATING A S DEFLATING THE ORIGINAL POLYNOMIAL WHEN A LINEAR OR QUADRATIC FACTOR IS FOUND; DEFLATION, DEFLATION TECHNIQUE, DEFLATION WHEN ONE ZERO IS ACCEPTED, DEGREE SPLINE INTERPOLATING A SET OF EQUISPACED DATA, DERIVATIVE OF ANOTHER REAL POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER, DERIVATIVE OF ANOTHER COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER, DERIVATIVE OF A FOURIER SERIES, GIVEN THE COEFFICIENTS OF THE TRIGONOMETRIC POLYNOMIAL, DERIVATIVE OF ANOTHER POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER, DESCENT METHOD IF THE FORMER METHOD GIVES DIVERGENCE; IN THE STEP VECTOR DIRECTION THE OPTIMAL STEP DESCENT WITH ACCELERATION DEVICES AND USING EXPLICIT DEFLATION WHEN ONE ZERO IS ACCEPTED, DETERMINANT, DETERMINANT, DETERMINANT AND CONDITION NUMBER ARE AVAILABLE, DETERMINANT AND CONDITION NUMBER OF THE MATRIX, DETERMINANT AND CONDITION NUMBER OF THE MATRIX, DETERMINANT AND CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTE DETERMINANT AND CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTE DETERMINANT AND CONDITION NUMBER, DETERMINANT AND CONDITION NUMBER, DETERMINANT AND ESTIMATING THE CONDITION NUMBER OF THE MATRIX, DETERMINANT AND ESTIMATING THE CONDITION NUMBER OF THE MATRIX, DETERMINANT IS ALSO AVAILABLE, DETERMINANT IS ALSO AVAILABLE, DETERMINANT IS ALSO AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT IS AVAILABLE, DETERMINANT OF A MATRIX PROVIDED TRIANGULAR DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOT; DETERMINED SYSTEM OF NONLINEAR EQUATIONS BY CALCULATING A STEP VECTOR DIRECTION AS A LEAST SQUARES S DEVIATIONS, VARIANCES, AND COEFFICIENTS OF SKEWNESS AND KURTOSIS FOR MULTIPLEXED ARRAYS, DEVICES AND USING EXPLICIT DEFLATION WHEN ONE ZERO IS ACCEPTED, DIAGONAL SIMILARITY TRANSFORMATIONS, DIFFERENCES ON TABULAR DATA WITH ARBITRARY SPACING, DIFFERENCE OF TWO REAL POLYNOMIALS, DIFFERENCE OF TWO COMPLEX POLYNOMIALS, DIFFERENTIAL EQUATIONS USING A PREDICTOR CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS METHOD OF SUCC DIFFERENTIAL EQUATIONS USING A RATIONAL EXTRAPOLATION TECHNIQUE BASED ON A MODIFIED MIDPOINT RULE; E DIFFERENTIAL EQUATIONS USING A VARIABLE STEP RUNGE KUTTA TECHNIQUE EFFICIENT FOR LOW ACCURACY WORK, DIFFERENTIAL EQUATIONS AS PROCEDURE RKINIT BUT RUNS FASTER AND REQUIRES MORE STORAGE, DIFFERENTIAL EQUATIONS BY COMBINING AN INITIAL VALUE SOLVER WITH A NONLINEAR EQUATION SOLVING PROGRA DIFFERENTIAL EQUATIONS, WHERE THE SOLUTION IS BASED ON THE PRINCIPLE OF SUPERPOSITION, USING SUBROUT DIFFERENTIAL EQUATION A*X, DIFFERENTIATES NUMERICALLY A FUNCTION GIVEN AS A TABLE WITH EQUISPACED ARGUMENTS, AT A TABULAR POINT DIFFERENTIATES NUMERICALLY AN EQUALLY SPACED TABULAR FUNCTION AT ANY POINT USING AN INTERPOLATING PO DIGITS IN THE FIRST COMPUTED SOLUTION, DIGITS IN THE FIRST COMPUTED SOLUTION, DIGITS IN THE FIRST COMPUTED SOLUTION, DIGITS IN THE FIRST COMPUTED SOLUTION, DIGITS IN THE FIRST COMPUTED SOLUTION, DIMENSIONAL TABLE; ARBITRARY ORDER, DIMENSIONAL TABLE; ARBITRARY ORDER, DIMENSIONAL TABLE; ARBITRARY ORDER, DISCRETE UNIFORM DISTRIBUTION,

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F18MULLP
F16BANEIG
F18CPOLRT
F15SPLINE
F13DERIV
F13CDERIV
F15TRGDIF
F15DERIV
F18NRSG
F18CPOLRT
F16CDECOM
F16DTSHFT
F16CGITRF
F16ITERFM
F16ITERFS
F16GITRFM
F16GITRFS
F16LITWNE
F16LITWNP
F16PDITRS
F16PDITRM
F16BDCWNP
F16BLESOM
F16BLSWNP
F16CHSDEC
F16DCWNE
F16DCWNP
F16DECOM
F16LESWNE
F16LESWNP
F16SPDCOM
F16DETERM
F18NRSG
F17DSCRPT
F18CPOLRT
F16BALANC
F15ACFI
F13SBR
F13CSBR
F14BLCKDQ
F14DRATEX
F14RKINIT
F14NRKUS
F14BVD
F14LINBVD
F16DEIG
F15DIFTAB
F15LAGDIF
F16GITRFM
F16GITRFS
F16ITRPDM
F16ITRPDS
F15TBLU1
F15TBLU2
F15TBLU3
F17PIUNFD

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F17RUNSAB
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F17CHIPRB
F17PBETA
F17PBINOM
F17PCHY
F17PFDIST
F17PGEOM
F17PGMA
F17PHYPG
F17PIUNF
F17PINORM
F17PIEXP
F17PIRNM
F17PILGNM
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 EIGENVECTORS AFTER A REDUCTION USING A TRIANGULAR MATRIX IN THE SIMILARITY TRANSFORMATION USED FOR S
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 F16BANEIG
 F16EIGSYM
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 F16VALVEC
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 F16SEPAR
 F16SEPAR2
 F16SYMLR
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 F16LATNTR
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 F16EIGCO1
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 F16EIGSYM
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 F16BDECOM
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 F16BLSWNP
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 F13ELK
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EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX AN
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EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECOM,
EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE DECOM,
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EQUILIBRATION HAS BEEN CARRIED OUT.
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ESTIMATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN TH
ESTIMATING THE DETERMINANT AND CONDITION NUMBER.
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ESTIMATING THE CONDITION NUMBER OF THE MATRIX.
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EXPONENTIAL DISTRIBUTION.
EXPONENTIAL DISTRIBUTION.
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F16DEIG
F16CGLESM
F16GLESOM
F16GLESOS
F16INVERS
F16INVITR
F16BLESOM
F16CDECOM
F16DECOM
F16BDECOM
F16BITRFM
F16GITRFM
F16GITRFS
F16BFBSUM
F16BITERM
F16CFBSUM
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F16CITERF
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F16FBSUBM
F16FBSUBS
F16ITERIN
F15DIPTAB
F15PARBC
F18CNSLVL
F18NSLVL
F16EIGCHK
F13ERF
F13ERFINV
F18CNSLVL
F18NSLVL
F17BRTLTT
F16CITERF
F16GITRFS
F16LITWNE
F16LITWNP
F16PDITRS
F16PDITRM
C16FABSV
F11MCF
F15CFQME
F15PRONY
F17EXRAND
F17PIEXP
F17PRBEXP
C12EXP
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F15HERMIT
F15LAGUER
C12PS1132
F12CBAREX
F12CBAREX
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LEX POLYNOMIAL BY A QUADRATIC
AL EQUATIONS USING A RATIONAL
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F13LDIV
F13CLDIV
F13FMULT1
F11HCF
F17HARM
F15SPLINE
F17FILTER
F15FOURI
F13ELK
F13ELF
F13BESNIS
F13BSJ
F13NBESJ
F14BLCKDQ
F14DRATEX
F14RKINIT
F13COMBES
F15ORTHFT
F15SURFS
F15FITLIN
F17CHIDST
F15CHEBAP
F17XIRAND
F15GM1
F16SUBDIR
F18CNLSVL
F18NSLVL
F13BSJ
F17HARM
F15TRGDIF
F15FOURI
F15FOURAP
F15TRGINT
F15SIGSMT
F17HARM
F11FFRAC
F13LOGGAM
F11FAFRAC
F11FMFRAC
F13PARFAC
F15ACF1
F17CHSQO
F13BESNIS
F13BESNKS
F13BSJ
F13COMBES
F13NBESJ
F13RBESY
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F17CHIPRB
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S THE CUMULATIVE DISTRIBUTION	FUNCTION OF THE BINOMIAL DISTRIBUTION.	F17PBINOM
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A SET OF PROGRAMS TO PERFORM
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EVERAL RIGHT-HAND SIDES USING

GAUSS LEGENDRE FORMULA TO A NUMBER OF SUBINTERVALS SPECIFIED BY THE USER.
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GAUSS QUADRATURE FORMULAS.
GAUSS QUADRATURE FORMULAS.
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GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION AND STORES THE VALUES IN A MULTIPLEXED ARRAY.
GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION.
GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION, PROVIDING A CONVENIENT WAY OF HANDLING THE TA
GENERATES RANDOM INTEGERS HAVING THE POISSON DISTRIBUTION.
GENERATES RANDOM NUMBERS HAVING UNIFORM OR NORMAL DISTRIBUTION.
GENERATES RANDOM NUMBERS HAVING A UNIFORM DISTRIBUTION AND STORES THE VALUES AS ONE VARIABLE IN A NU
GENERATES UNIFORM RANDOM INTEGERS BETWEEN TWO GIVEN VALUES.
GENERATES UNIFORM FLOATING POINT NUMBERS BETWEEN TWO GIVEN VALUES.
GEOMETRIC DISTRIBUTION.
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GEOMETRIC DISTRIBUTION.
GOODNESS OF FIT.
GRADIENT.
GRADIENT METHOD.
GRADIENT METHOD.
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GUESS OF AN EIGENVALUE TO A COMPLEX HESSENBERG MATRIX USING HYMANS METHOD TO EVALUATE THE DETERMINAN
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HESSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
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HOUSEHOLDERS METHOD.
HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT.
HOUSEHOLDERS METHOD.
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HOUSEHOLDERS METHOD.
HOUSEHOLDERS TRANSFORMATION FOLLOWED BY DOUBLE QR ITERATION.
HOUSEHOLDERS TRANSFORMATION TO TRIDIAGONAL FORM FOLLOWED BY EITHER QR ITERATION OR LR ITERATION OR T
HOUSEHOLDERS TRANSFORMATION.
HOUSEHOLDERS TRANSFORMATION.
HOUSEHOLDER TRANSFORMATIONS.
HOUSEHOLDER TRANSFORMATIONS.

F15GMI
F15HERMIT
F15LAGUER
F15LEGEND
F13EL3
F18NONLIQ
F16REDSY1
F16REDSY2
C12PS1132
F12CBAREX
F17EXRAND
F17NRAND
F17NRML
F17NRMNO
F17PORAND
F17RAND
F17URAND
F17IRAND
F17XIRAND
F17PGEOM
F17PHYPGE
F17PIHYPG
F17PIGEO
F17CHIDST
F16CCONGR
F16FCGM2
F16SCONG
F18QRNWT
F16DTSHFT
F13HANKEL
F11LCM
F15HERMIT
F15HRMT1
F15HRMT2
F15FHRNEW
F16TCDIAG
F16HSSN
F16SUBDIR
F16SUBDIA
F16EIGIMP
F16EIGVCH
F16QREIGN
F16QR1
F16DTSHFT
F16SIMP
F16VALVEC
F11HCF
F17HSTGRM
F17BRTLTT
F16BSUBHT
F16DCBHT
F161TRLSQ
F16SUBDIR
F16LSQSIT
F16SUBDIA
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F16TRIDI
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F16LSQHTM

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UMBER OF TIMES WITH DIFFERENT
COMPUTES THE DOUBLE PRECISION
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GENERATES UNIFORM RANDOM

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BE USED FOR COMPLETE ELLIPTIC
EVALUATES A M-TUPLE
FINITE INTERVAL USING ROMBERG
BETWEEN ARBITRARY LIMITS; THE
EAR TREND THAT IS OBTAINED BY
TES THE LAGRANGIAN POLYNOMIAL
AITKENS METHOD THE POLYNOMIAL
STRUCTS A FIFTH DEGREE SPLINE
UCTS A NONLINEAR CUBIC SPLINE
INTS ARE GENERATED ON A CUBIC
ORD HEIGHT TOLERANCE USING AN
OF THE N-TH DEGREE LAGRANGIAN
OF THE N+M+1 DEGREE HERMITIAN
UNCTION AT ANY POINT USING AN
ARIABLE BASED ON LAGRANGIAN
OR IS CALCULATED BY PARABOLIC
PERFORMS HERMITE

HYMANS METHOD TO EVALUATE THE DETERMINANT,
HYPERBOLIC COSINE TRIGONOMETRIC FUNCTION,
HYPERBOLIC SINE TRIGONOMETRIC FUNCTION,
HYPERBOLIC TANGENT TRIGONOMETRIC FUNCTION,
HYPER GEOMETRIC DISTRIBUTION,
HYPER GEOMETRIC DISTRIBUTION,

IMPLICIT EQUILIBRATION A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS,
IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BDECOM,
IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION
IMPLICIT EQUILIBRATION AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBER,
IMPLICIT EQUILIBRATION; THE DETERMINANT IS ALSO AVAILABLE,
IMPROVES AN APPROXIMATE EIGENVALUE EIGENVECTOR PAIR OF A REAL SYMMETRIC MATRIX BY CALCULATING THE RA
INCOMPLETE BETA RATIO,

INCOMPLETE ELLIPTIC INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION,
INCOMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND BY USING THE GAUSS TRANSFORMATION; COULD BE USED FOR
INCOMPLETE GAMMA FUNCTION,
INCREASING MAGNITUDE IN A WAY WHICH IS NOT EFFICIENT FOR A LARGE SET OF NUMBERS,
INCREASING ORDER,
INITIAL GUESSES,
INNER PRODUCT OF TWO VECTORS HAVING COMPLEX ELEMENTS,
INNER PRODUCT OF TWO VECTORS WHICH MAY BE A COLUMN OR A ROW OF A MATRIX USING EITHER SINGLE OR DOUBL
INRRPD, PRDSUM,

INTEGERS BETWEEN TWO GIVEN VALUES,
INTEGERS HAVING THE POISSON DISTRIBUTION,
INTEGER, REAL, COMPLEX, AND DOUBLE PRECISION,
INTEGER ORDERS,

INTEGER ORDERS BY USING BACKWARD RECURSION,
INTEGER ORDER BY SUMMATION OF SERIES FOR BESSEL FUNCTIONS,
INTEGRALS USING CHERYSHEV APPROXIMATIONS,

INTEGRAL BY HERMITE GAUSS QUADRATURE FORMULAS,
INTEGRAL BY LAGUERRE GAUSS QUADRATURE FORMULAS,
INTEGRAL BY SIMPSONS RULE OF A BOUNDED FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL OF EQUISPACED
INTEGRAL OF ANOTHER REAL POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
INTEGRAL OF ANOTHER COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL USING ROMBERG INTEGRATION,
INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL, USING LEGENDRE GAUSS FORMULAS AND UNE
INTEGRAL OF A FUNCTION OVER A FINITE INTERVAL USING SIMPSONS RULE,

INTEGRAL OF A REAL FUNCTION OF ONE VARIABLE BASED ON LAGRANGIAN INTERPOLATION,
INTEGRAL OF ONE VARIABLE OVER A FINITE INTERVAL USING LEGENDRE GAUSS QUADRATURE FORMULAS,
INTEGRAL OF THE THIRD KIND BY THE LANDEN TRANSFORMATION,
INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION,
INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION,
INTEGRAL OF THE THIRD KIND BY USING THE GAUSS TRANSFORMATION; COULD BE USED FOR COMPLETE ELLIPTIC IN
INTEGRAL OF THE THIRD KIND SOMETIMES,
INTEGRAL (M LESS 1) OF AN INTEGRAND BETWEEN ARBITRARY LIMITS; THE INTEGRATION IS PERFORMED BY USING

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C12SINH
C12TANH
F17PHYPPG
F17PIHYPG
F16BDECOM
F16BFBSUM
F16BITERM
F16BITRFM
F16BLESOM
F16EIGCHK
F17BETAR
F13ELF
F13EL3
F17GAMAIN
F16VECORD
F17VARORD
F16RQNW
F16CINPRD
C16VIP
C16VIP
F17IRAND
F17PORAND
C12PS1132
F13RBESY
F13NBESJ
F13HANKEL
F13SICI
F15HERMIT
F15LAGUER
F15PARBC
F13INT
F13CINT
F15ROMBG
F15QUAD
F15SIMPRC
F15LAGRAN
F15LEGEND
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F13ELK
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LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL
LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION A
LINEAR SYSTEM FOR A LARGE SPARSE RECTANGULAR MATRIX USING THE CONJUGATE GRADIENT METHOD,
LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITH PARTIAL PIVOTING HAS BEEN CARRIED
LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX USING PARTIAL PIVOTING,
LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT,
LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX WITHOUT PIVOTING,
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKYS DECOMPOSITION AND PROVIDES DATA FOR CA
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY DECOMPOSITION,
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOM
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTINE,
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION,
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES,
LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES,
LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING
LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM
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LINEAR SYSTEM PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,
LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CARRIED OUT,
LINEAR SYSTEM PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE,
LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA F
LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINAN
LINEAR SYSTEM USING CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE,
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F15LEGEND
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F18HELP
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F18LINSYS
F13LDIV
F13CLDIV
F13FMULT1
F16LSQHTS
F16LSQHTM
F16LSQSIT
F16FCGM2
F16TRILOM
F16TRIUPM
F16GLESOS
F16BFBANP
F16BFBSUM
F16BITRNP
F16BITERM
F16BITRFM
F16BITRPD
F16BITWNP
F16BLESOM
F16BLSWNP
F16BPDITM
F16BPDFSB
F16BPDOSM
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F16CGITRF
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F16CITERF
F16SCONG
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F16TRDSOM
F16TRDSUB
F16TRDWNP
F16PDI TRM
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F16SPDFBS
F16SPDOS
F16SPITRS
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ROUTINE TO MULTIPLY A COMPLEX

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LINEAR SYSTEM USING CHOLESKY DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND EST
LINEAR SYSTEM USING CHOLESKY DECOMPOSITION,
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LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS A
LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING
LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND
LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQ
LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED DECOMPOSITION WITH CHCLESKYS METHOD HAS BEEN C
LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIE
LINEAR SYSTEM WITHOUT USING THE SQUARE ROOT ROUTINE,
LINEAR TREND, IN THE LEAST SQUARES SENSE, TO A SET OF EQUISPACED DATA,
LINEAR TREND GIVEN A SET OF (ABSCISSA, ORDINATE) PAIRS WITH ARBITRARY SPACING,
LINEAR TREND THROUGH A SET OF EQUISPACED POINTS,
LINEAR TREND THAT IS OBTAINED BY INTEGRATION OF A TRIGONOMETRIC POLYNOMIAL,
LINE TO A NUMBER OF DATA POINTS, IN THE SENSE THAT THE SUM OF THE SQUARES OF THE PERPENDICULAR DISTA
LOGARITHM OF A REAL ARGUMENT,
LOGARITHM OF A DOUBLE PRECISION REAL ARGUMENT,
LOGARITHM OF A COMPLEX ARGUMENT,
LOGARITHM OF A REAL ARGUMENT,
LOGARITHM OF A DOUBLE PRECISION REAL ARGUMENT,
LOGARITHM OF THE GAMMA FUNCTION FOR COMPLEX ARGUMENT BY USING CONTINUED FRACTIONS,
LOG NORMAL DISTRIBUTION,
LOG NORMAL DISTRIBUTION,
LOWER TRIANGULAR LINEAR SYSTEM,
LOWER TRIANGULAR LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES,
LOWER TRIANGULAR MATRIX,
LOWEST TERMS,
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LR ITERATION,
LR ITERATION OR THE STURM SEQUENCE METHOD; EIGENVECTORS ARE FOUND BY MEANS OF INVERSE ITERATION,
MACHINE AND MATHEMATICAL CONSTANTS AS SINGLE PRECISION NUMBERS OF MAXIMUM ACCURACY,
MAGNITUDE IN A WAY WHICH IS NOT EFFICIENT FOR A LARGE SET OF NUMBERS,
MANTISSA AND EXPONENT (BASE 2) OF THE DETERMINANT OF A MATRIX PROVIDED TRIANGULAR DECOMPOSITION USIN
MATHEMATICAL CONSTANTS AS SINGLE PRECISION NUMBERS OF MAXIMUM ACCURACY,
MATRIARCH SUBROUTINE TO DO A MATRIX VECTOR MULTIPLICATION,
MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED MATRIX BY A VECTOR,
MATRIARCH SUBROUTINE TO MULTIPLY A COMPLEX MATRIX BY A COMPLEX VECTOR,
MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED COMPLEX MATRIX BY A COMPLEX VECTOR,
MATRIARCH SUBROUTINE TO COMPUTE THE EUCLIDIAN NORM OF A VECTOR,
MATRIARCH SUBROUTINE TO NORMALIZE A VECTOR IN THE 2 NORM,
MATRIARCH SUBROUTINE TO SUBTRACT FROM A VECTOR ITS COMPONENT ALONG ANOTHER VECTOR,
MATRIARCH SUBROUTINE TO PERFORM A MATRIX MATRIX MULTIPLICATION,
MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED MATRIX BY A MATRIX ON THE RIGHT,
MATRIARCH SUBROUTINE TO SUBTRACT A CONSTANT TIMES A VECTOR FROM ANOTHER VECTOR,
MATRIARCH SUBROUTINE TO MULTIPLY A LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT,
MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT,
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MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION,
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MATRIX BY A COMPLEX VECTOR,

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F16GLESOM
F16GITRFM
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F16ITRSPS
F16SPDSOM
F15FOURAP
F15SINSER
F15FOURI
F15TRGINT
F15FITLIN
C12ALOG
C12DLOG
C12CLOG
C12ALOG10
C12DLOG10
F13LOGGAM
F17PILGNM
F17PLGNRM
F16TRILOM
F16TRILOS
F16TRLOIN
F11FAFRAC
F11FMFRAC
F16SYMLR
F16TCDIAG
F13AMCON
F16VECORD
F16DETERM
F13AMCON
C16FMVX
C16FMTVX
C16FMVXX
C16FMTVXX
C16FABSX
C16FNORM1
C16FPUR
C16FMMX
C16FMTMX
C16FCOMB
C16SMVX
C16SMTVX
C16FMTR
F16EIGSYM
F16ITERFM
F16ITERFS
C16FMTR
F16PDI TRS
F16PDI TRM
F16RAYLGH
F16TRLOIN
F16TRUPIN
F16GITRFM
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C16FMVXX

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TE LINEAR SYSTEM PROVIDED THE
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THE ERROR FUNCTION BY NEWTONS

MATRIX BY A COMPLEX VECTOR,
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MATRIX BY A VECTOR ON THE RIGHT,
MATRIX BY A VECTOR ON THE RIGHT,
MATRIX BY A VECTOR ON THE RIGHT,
MATRIX BY CALCULATING THE RAYLEIGH QUOTIENT AND GIVES ERROR BOUNDS,
MATRIX BY MEANS OF WIELANDT INVERSE ITERATION,
MATRIX BY MEANS OF INVERSE ITERATION,
MATRIX BY MEANS OF A MODIFICATION OF LAGUERRES METHOD,
MATRIX BY MEANS OF QR ITERATION ON A SIMILAR BALANCED HESSENBERG MATRIX,
MATRIX BY MEANS OF DIAGONAL SIMILARITY TRANSFORMATIONS,
MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE,
MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE,
MATRIX HAVING DISTINCT REAL EIGENVALUES,
MATRIX HAVING REAL SUBDIAGONAL ELEMENTS,
MATRIX INTO LOWER TRIANGULAR, DIAGONAL AND UPPER TRIANGULAR FACTORS WITHOUT CALCULATING A SQUARE ROO
MATRIX INTO LOWER AND UPPER TRIANGULAR FACTORS USING PARTIAL PIVOTING,
MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; A
MATRIX INTO TRIANGULAR FACTORS USING CHOLESKYS METHOD; THE DETERMINANT IS AVAILABLE,
MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATIO
MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE
MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; T
MATRIX INTO TRIANGULAR FACTORS WITHOUT PIVOTING,
MATRIX INTO TRIDIAGONAL FORM USING HOUSEHOLDERS TRANSFORMATION,
MATRIX INTO UPPER TRIANGULAR FORM BY HOUSEHOLDERS METHOD,
MATRIX INTO UPPER HESSENBERG FORM ACCORDING TO HOUSEHOLDERS METHOD,
MATRIX IN THE SIMILARITY TRANSFORMATION USED FOR SOLVING THE GENERAL EIGENVALUE PROBLEM,
MATRIX IN THE SIMILARITY TRANSFORMATION USED FOR SOLVING THE GENERAL EIGENVALUE PROBLEM,
MATRIX MATRIX MULTIPLICATION,
MATRIX PROVIDED TRIANGULAR DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILI
MATRIX PROVIDED TRIANGULAR DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILI
MATRIX PROVIDED THE TRANSFORMATION TO HESSEBERG FORM HAS BEEN CARRIED OUT WITH WILKENSONS METHOD,
MATRIX PROVIDED DECOMPOSITION WITH PARTIAL PIVOTING HAS BEEN CARRIED OUT,
MATRIX PROVIDED DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT,
MATRIX TO HESSENBERG FORM USING A MODIFICATION OF HOUSEHOLDERS METHOD,
MATRIX TO UPPER HESSENBERG FORM USING WILKINSONS METHOD,
MATRIX USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,
MATRIX USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,
MATRIX USING EITHER SINGLE OR DOUBLE PRECISION; OTHER SUBROUTINES ARE VIPA, VIPS, VIPD, VIPDA, VIPDS
MATRIX USING HOUSEHOLDERS TRANSFORMATION FOLLOWED BY DOUBLE QR ITERATION,
MATRIX USING HOUSEHOLDERS TRANSFORMATION TO TRIDIAGONAL FORM FOLLOWED BY EITHER QR ITERATION OR LR I
MATRIX USING HYMANS METHOD TO EVALUATE THE DETERMINANT,
MATRIX USING LR ITERATION,
MATRIX USING PARTIAL PIVOTING,
MATRIX USING QR ITERATION,
MATRIX USING QR ITERATION ON A SIMILAR HESSENBERG MATRIX FOR THE EIGENVALUES AND INVERSE ITERATION F
MATRIX USING THE CONJUGATE GRADIENT METHOD,
MATRIX USING THE STURM SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS,
MATRIX USING THE STURM SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS,
MATRIX VECTOR MULTIPLICATION,
MATRIX WITHOUT PIVOTING,
MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION FOLLOWING CROUTS ALGORITM
MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGOR
MATRIX WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRAT
MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM
MAXIMUM, AND RANGE FOR ONE OR ALL VARIABLES IN A MULTIPLEXED ARRAY,
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F16QREIGN
F16BALANC
F16SPDFBM
F16SPDFBS
F16EIGCO1
F16QR1
F16SPDCOM
F16TRDCOM
F16DCECOM
F16CHSDEC
F16DCWNE
F16DCWNP
F16DECOM
F16TRDCNP
F16TRIDI
F16DCBHT
F16SUBDIR
F16RECOV1
F16RECOV2
C16FMMX
F16DETERM
F16ITERIN
F16SIMP
F16TRDFBM
F16TRDSUB
F16SUBDIA
F16HSSN
F16INVERS
F16INVITR
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F16TCDIAG
F16DTSHFT
F16SYMMLR
F16TRDSOM
F16SYMQR
F16VALVEC
F16SCONG
F16SEPAR
F16SEPAR2
C16FMVX
F16TRDWNP
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F16CGLESW
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TRIANGULAR FORM BY HOUSEHOLDERS
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ING TO THE CONJUGATE GRADIENT
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FORM ACCORDING TO HOUSEHOLDERS
ES PROBLEM USING HOUSEHOLDERS
MODIFICATION OF HOUSEHOLDERS
USING THE CONJUGATE GRADIENT
N CARRIED OUT WITH WILKINSONS
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GULAR FACTORS USING CHOLESKYS
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METHOD AND FACTORING OUT PREVIOUSLY FOUND ZEROS.
METHOD AND SWITCHING TO THE STEEPEST DESCENT METHOD IF THE FORMER METHOD GIVES DIVERGENCE; IN THE ST
METHOD A REAL, SYMMETRIC POSITIVE DEFINITE BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS.
METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF EACH METHOD AND DEFLATING THE ORIGINAL POLYNOMI
METHOD FOR ISOLATING ONE ZERO.
METHOD FOR THE TRIANGULAR DECOMPOSITION.
METHOD FOR THE TRIANGULAR DECOMPOSITION.
METHOD HAS BEEN CARRIED OUT.
METHOD HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BCHSDC.
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METHOD IF THE FORMER METHOD GIVES DIVERGENCE; IN THE STEP VECTOR DIRECTION THE OPTIMAL STEP VECTOR I
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METHOD MODIFYING THIS CORRECTION VECTOR WHEN IT IS TOO LARGE OR WHEN THE CORRECTION DOES NOT IMPROVE
METHOD MODIFYING THE STEP VECTOR WHEN THE SET OF GUESSES TEND TO BECOME LINEARLY DEPENDENT OR WHEN T
METHOD OF CONJUGATE GRADIENT.
METHOD OF EIGHTH ORDER AND PICARDS METHOD OF SUCCESSIVE SUBSTITUTION.
METHOD OF INVERSE WIELANDT ITERATION WITH PERIODIC RAYLEIGH QUOTIENT SHIFTING COMBINED WITH A STABLE
METHOD OF LEAST SQUARES A POLYNOMIAL OF SPECIFIED DEGREE WHOSE GRAPH APPROXIMATES A SET OF DATA POIN
METHOD OF SUCCESSIVE SUBSTITUTION.
METHOD OR BAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF EACH METHOD AND DEFLATING T
METHOD THE POLYNOMIAL INTERPOLATED VALUE AT A GIVEN ABSCISSA, GIVEN N POINTS TO FIT EXACTLY BY A POL
METHOD TO EVALUATE THE DETERMINANT.
METHOD USING SCHURS METHOD FOR ISOLATING ONE ZERO.
METHOD WITH DEFLATION.
MINIMAX FIT OF A GIVEN FUNCTION OVER A GIVEN INTERVAL.
MINIMAX FUNCTION APPROXIMATION TO A SET OF GIVEN POINTS IN TERMS OF A LINEAR COMBINATION OF A PRESCR
MINIMAX POLYNOMIAL THROUGH A DISCRETE, WEIGHTED SET OF POINTS.
MINIMAX RATIONAL FUNCTION APPROXIMATION OF GIVEN DEGREE TO A DISCRETE DATA SET.
MINIMIZE THE RIPPLE IN CURVATURE.
MINIMUM, MAXIMUM, AND RANGE FOR ONE OR ALL VARIABLES IN A MULTIPLEXED ARRAY.
MODIFIED BESSEL FUNCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY USING BACKWARD RECURSION.
MODIFIED BESSEL FUNCTIONS OF THE SECOND KIND FOR REAL ARGUMENT BY USING POLYNOMIAL APPROXIMATIONS AN
MOVING AVERAGE AUTO REGRESSIVE FILTER.
MULLERS METHOD WITH DEFLATION.
MULLERS METHOD AND FACTORING OUT PREVIOUSLY FOUND ZEROS.
MULTIPLEXED ARRAY AND A GIVEN CONSTANT.
MULTIPLEXED ARRAY.
MULTIPLEXED ARRAYS.
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MULTIPLEXED ARRAYS.
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MULTIPLEXED ARRAYS IN INCREASING ORDER.

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F16EIG5
F16FCGM2
F16HSSN
F16SUBDIR
F16LSQSIT
F16SUBDIA
F16SCONG
F16SIMP
F16TCDIAG
F16CHSDEC
F18LINSYS
F18ZAFUM
F18NRSG
F16BCHSDC
F18PROOT
F18HELP
F16BPDITM
F16BPDOSM
F16BITRPD
F16BPDFSB
F16BSUBHT
F16ITRLSQ
F16ITRPDM
F16ITRPDS
F18NRSG
F18QWNT
F18NEWT
F18NONLIO
F16CCONGR
F14BLCKDQ
F16BANEIG
F15FLSQFY
F14BLCKDQ
F18PROOT
F15AITKEN
F16DTSHTF
F18HELP
F18MULLP
F15CHEBAP
F15MIGEN
F15CFQME
F15MINRAT
F15RICH
F17DSCRPT
F13BESN2
F13BESN1
F13BESNKS
F17FILTER
F18MULLP
F18ZAFUM
F17CONRAY
F17CORCOV
F17DSCRPT
F17DSCRPT
F17DSCRPT
F17NRAND
F17NRMNO
F17OP1RAY
F17OP2RAY
F17URAND
F17VARORD

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MULTIPLY A TRANSPOSED LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT, NARROW BANDMATRIX USING THE METHOD OF INVERSE WIELANDT ITERATION WITH PERIODIC RAYLEIGH QUOTIENT SHI, NATURAL LOGARITHM OF A REAL ARGUMENT, NATURAL LOGARITHM OF A DOUBLE PRECISION REAL ARGUMENT, NATURAL LOGARITHM OF A COMPLEX ARGUMENT, NATURAL LOGARITHM OF THE GAMMA FUNCTION FOR COMPLEX ARGUMENT BY USING CONTINUED FRACTIONS,

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NEWTONS METHOD OR BAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF EACH METHOD AND DEF NEWTON RAPHSON METHOD MODIFYING THIS CORRECTION VECTOR WHEN IT IS TOO LARGE OR WHEN THE CORRECTION D NEWTON RAPHSON METHOD AND SWITCHING TO THE STEEPEST DESCENT METHOD IF THE FORMER METHOD GIVES DIVERG NEWTON RAPHSON METHOD IN THE FIRST ITERATION AND BY UPDATING THE APPROXIMATION OF THE JACOBIAN IN TH NONLINEAR ALGEBRAIC EQUATIONS USING THE GENERALIZED SECANT METHOD MODIFYING THE STEP VECTOR WHEN THE NONLINEAR BOUNDARY VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS BY COMBINING AN INITIAL VALUE S NONLINEAR CUBIC SPLINE INTERPOLATING A SET OF POINTS WITH ARBITRARY SPACING,

NONLINEAR EQUATIONS BY COMPUTING IN EACH ITERATION A CORRECTION VECTOR TO THE TRIAL SOLUTION VECTOR NONLINEAR EQUATIONS BY CALCULATING A STEP VECTOR DIRECTION AS A LEAST SQUARES SOLUTION OF THE SYSTEM NONLINEAR EQUATIONS BY USING THE NEWTON RAPHSON METHOD IN THE FIRST ITERATION AND BY UPDATING THE AP NONLINEAR EQUATIONS BY CALLING SUBROUTINE QNWT A NUMBER OF TIMES WITH DIFFERENT INITIAL GUESSES, NONNEGATIVE DEFINITE, NARROW BANDMATRIX USING THE METHOD OF INVERSE WIELANDT ITERATION WITH PERIODIC NORMALIZE A VECTOR IN THE 2 NORM, NORMAL DISTRIBUTION AND STORES THE VALUES IN A MULTIPLEXED ARRAY,

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F11LCM
C16FMVX
C16FMMX
F13FMULT1
F11FMFRAC
C16FMVXC
C16SMVX
C16FMTVX
C16FMTVXC
C16FMTMX
C16SMTVX
F16BANEIG
C12ALOG
C12DLOG
C12CLOG
F13LOGGAM
F17PINBIN
F17PNBIN
F17EXRAND
F13ERFINV
F16PROOT
F18NEW
F18NRSG
F18QNW
F18NONLIO
F14BVD
F15UNCSP
F18NEW
F18NRSG
F18QNW
F18QNW
F16BANEIG
C16FNORM1
F17NRAND
F17NRML
F17NRMNO
F17PINORM
F17PITRNM
F17PILGNM
F17PLGNRM
F17PNORM
F17PTRNRM
F17RAND
C16FNORM1
C16FABSV
F18ZAFUJ
F18ZAFUR
F16VECORD
F17XIRAND
F17EXRAND
F17NRAND
F17NRML
F17NRMNO
F17RAND
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F16CITERF

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NUMERICALLY AN EQUALLY SPACED TABULAR FUNCTION AT ANY POINT USING AN INTERPOLATING POLYNOMIAL OF SPE
NUMERICALLY A FUNCTION GIVEN AS A TABLE WITH EQUISPACED ARGUMENTS, AT A TABULAR POINT OR AT THE MIDP
OBSERVATIONS.
OBSERVATIONS FROM A DATA ARRAY.
OBSERVATIONS IN SPECIFIED INTERVALS; USED TO PRODUCE HISTOGRAMS.
OBSERVATIONS OF ONE VARIABLE IN A MULTIPLEXED ARRAY.
OBSERVATIONS OF TWO VARIABLES IN MULTIPLEXED ARRAYS.
OBSERVATION OF A SET.
ONE DIMENSIONAL TABLE; ARBITRARY ORDER.
OPERATIONS ON THE VALUES OF ONE VARIABLE IN A MULTIPLEXED ARRAY AND A GIVEN CONSTANT.
OPTIMAL STEP VECTOR IS CALCULATED BY PARABOLIC INTERPOLATION.
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ORDERS BY USING BACKWARD RECURSION.
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ORDER BY SUMMATION OF SERIES FOR BESSEL FUNCTIONS.
ORDER CONTINUITY.
ORDER DIFFERENTIAL EQUATION A*X.
ORDER OF COMPLEX POLYNOMIAL COEFFICIENTS IN AN ARRAY.
ORDER OF REAL POLYNOMIAL COEFFICIENTS IN AN ARRAY.
ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A PREDICTOR CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS
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ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A VARIABLE STEP RUNGE KUTTA TECHNIQUE EFFICIENT FOR LOW
ORDER (ABCISSA).
ORDINARY DIFFERENTIAL EQUATIONS USING A PREDICTOR CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS METHO
ORDINARY DIFFERENTIAL EQUATIONS USING A RATIONAL EXTRAPOLATION TECHNIQUE BASED ON A MODIFIED MIDPOIN
ORDINARY DIFFERENTIAL EQUATIONS USING A VARIABLE STEP RUNGE KUTTA TECHNIQUE EFFICIENT FOR LOW ACCURA
ORDINARY DIFFERENTIAL EQUATIONS BY COMBINING AN INITIAL VALUE SOLVER WITH A NONLINEAR EQUATION SOLV
ORDINARY DIFFERENTIAL EQUATIONS, WHERE THE SOLUTION IS BASED ON THE PRINCIPLE OF SUPERPOSITION, USIN
ORDINATES) AGAINST A SINGLE VARIABLE (ABCISSA),
ORDINATES) IN THEIR STORED ORDER (ABCISSA),
ORTHOGONAL POLYNOMIALS.
OVER DETERMINED SYSTEM OF NONLINEAR EQUATIONS BY CALCULATING A STEP VECTOR DIRECTION AS A LEAST SQUA
PADE APPROXIMATION TO A FUNCTION OF WHICH THE MACLAURIN EXPANSION IS GIVEN.
PARABOLIC INTERPOLATION.
PARTIAL FRACTIONS GIVEN THE ROOTS OF THE DENOMINATOR POLYNOMIAL AND THE COEFFICIENTS OF THE NUMERATO
PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTOR
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F16GITRFS
F16PDITRS
F16PDITRM
F18ZCOUNT
F15LAGDIF
F15DIFTAB
F17SUMPS
F17DELETE
F17HSTGRM
F17OP1RAY
F17OP2RAY
F17ZRNM
F15TBLU1
F17CONRAY
F18NRSG
F13RBESY
F16VECORD
F13NBESJ
F13COMBES
F17VARORD
F13HANKEL
F15COMCUB
F16DEIG
F13CREV
F13REV
F14BLCKDQ
F14DRATEX
F14RKINIT
F17YPLOT
F14BLCKDQ
F14DRATEX
F14RKINIT
F14BVD
F14LINBVD
F17XYPLOT
F17YPLOT
F15FLSQFY
F18NRSG
F15PADE
F18NRSG
F13PARFAC
F16BDECOM
F16BFBSUM
F16BITERM
F16BITRFM
F16BLESOM
F16CDECOM
F16CFBSUM
F16CGITRF
F16CGLESM
F16CITERF

S USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16DCWNE
S USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16DECOM
N USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECOM,	F16DETERM
DING TO CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE DECOM,	F16FBSSUBM
DING TO CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT,	F16FBSSUBS
TRIANGULAR DECOMPOSITION WITH	PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING	F16GTERFM
TRIANGULAR DECOMPOSITION WITH	PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING	F16GTERFS
DING TO CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16GLESOM
DING TO CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16GLESOS
X USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16INVERS
X USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16INVTR
USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION	F16GTRFM
M USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION	F16GTRFS
N USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT,	F16ITERIN
M USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16LESWNE
M USING CROUTS ALGORITHM WITH	PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND COND	F16LITWNE
PPER TRIANGULAR FACTORS USING	PARTIAL PIVOTING,	F16TRDCOM
X PROVIDED DECOMPOSITION WITH	PARTIAL PIVOTING HAS BEEN CARRIED OUT,	F16TRDFBM
OR A TRIDIAGONAL MATRIX USING	PARTIAL PIVOTING,	F16TRDSOM
OO LITTLE'S METHOD AND APPLYING	PARTIAL PIVOTING AND DOUBLE PRECISION ARITHMETIC FOR THE CALCULATION OF INNER PRODUCTS,	F18LINSYS
VERSE WIELANDT ITERATION WITH	PERIODIC RAYLEIGH QUOTIENT SHIFTING COMBINED WITH A STABLE, BAND-PRESERVING DEFLATION TECHNIQUE,	F16BANEIG
OR METHOD OF EIGHTH ORDER AND	PICARD'S METHOD OF SUCCESSIVE SUBSTITUTION,	F14BLCKDQ
ANGULAR FACTORS USING PARTIAL	PIVOTING,	F16TRDCOM
DIAGONAL MATRIX USING PARTIAL	PIVOTING,	F16TRDSOM
AR DECOMPOSITION WITH PARTIAL	PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DE	F16ITERFM
AR DECOMPOSITION WITH PARTIAL	PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DE	F16ITERFS
S METHOD AND APPLYING PARTIAL	PIVOTING AND DOUBLE PRECISION ARITHMETIC FOR THE CALCULATION OF INNER PRODUCTS,	F18LINSYS
SIAN ELIMINATION WITH PARTIAL	PIVOTING AND IMPLICIT EQUILIBRATION A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS,	F16BDECOM
AR DECOMPOSITION WITH PARTIAL	PIVOTING AND IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BDECOM,	F16BFBSUM
AR DECOMPOSITION WITH PARTIAL	PIVOTING AND IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND	F16BITERM
SIAN ELIMINATION WITH PARTIAL	PIVOTING AND IMPLICIT EQUILIBRATION AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBER,	F16BITRFM
SIAN ELIMINATION WITH PARTIAL	PIVOTING AND IMPLICIT EQUILIBRATION; THE DETERMINANT IS ALSO AVAILABLE,	F16BLESOM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION; ALSO COMPUTES ITS DETERMINANT,	F16CDECOM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE CDECOM,	F16CFBSUM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT; THE DETERMINANT AND CONDITION NUMBER ARE AVAILA	F16CGITRF
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION,	F16CGLESM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE C	F16CITERF
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16DECOM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECOM,	F16DETERM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE DECOM,	F16FBSSUBM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT,	F16FBSSUBS
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION,	F16GLESOM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION,	F16GLESOS
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION,	F16INVERS
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION,	F16INVTR
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER	F16GTRFM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER	F16GTRFS
CROUTS ALGORITHM WITH PARTIAL	PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT,	F16ITERIN
ED DECOMPOSITION WITH PARTIAL	PIVOTING HAS BEEN CARRIED OUT,	F16TRDFBM
CROUTS ALGORITHM WITH PARTIAL	PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16DCWNE
CROUTS ALGORITHM WITH PARTIAL	PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16LESWNE
CROUTS ALGORITHM WITH PARTIAL	PIVOTING WITHOUT ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NU	F16LITWNE
PROVIDES A PRINTER	PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) IN THEIR STORED ORDER (ABSCISSA),	F17YXPLOT
PROVIDES A PRINTER	PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) AGAINST A SINGLE VARIABLE (ABSCISSA),	F17XYXPLOT
REAL POLYNOMIAL AT A COMPLEX	POINT BY FACTORIZING WITH A QUADRATIC TERM,	F13COMPEV
RATES UNIFORM RANDOM FLOATING	POINT NUMBERS BETWEEN TWO GIVEN VALUES,	F17XIRAND
DISTRIBUTION FUNCTION OF THE	POISSON DISTRIBUTION,	F17PIPOIS
DISTRIBUTION FUNCTION OF THE	POISSON DISTRIBUTION,	F17POIS
ES RANDOM INTEGERS HAVING THE	POISSON DISTRIBUTION,	F17PORAND
E COMPLEX PLANE ENCLOSED BY A	POLYGON,	F18ZCOUNT

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POSITIVE DEFINITE LINEAR SYSTEM PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,
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 POSITIVE DEFINITE LINEAR SYSTEM USING CHOLESKY DECOMPOSITION,
 POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY DECOMPOSITION,
 POSITIVE DEFINITE LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS B
 POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION US
 POSITIVE DEFINITE MATRIX INTO LOWER TRIANGULAR, DIAGONAL AND UPPER TRIANGULAR FACTORS WITHOUT CALCUL
 POSITIVE DEFINITE LINEAR SYSTEM PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROO
 POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPO
 POSITIVE DEFINITE LINEAR SYSTEM WITHOUT USING THE SQUARE ROOT ROUTINE,
 POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTIN
 POSITIVE DEFINITE LINEAR SYSTEM USING SQUARE ROOT FREE DECOMPOSITION,
 POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION
 POSITIVE REAL ARGUMENT AND INTEGER ORDERS,
 POWERS OF OBSERVATIONS,
 PRDSUM,
 PRECISION,
 PRECISION; OTHER SUBROUTINES ARE VIPA, VIPS, VIPD, VIPDA, VIPDS, INRPRD, PRDSUM,
 PRECISION ARCTANGENT TRIGONOMETRIC FUNCTION,
 PRECISION ARCTANGENT TRIGONOMETRIC FUNCTION OF A QUOTIENT U/V,
 PRECISION ARITHMETIC FOR THE CALCULATION OF INNER PRODUCTS,
 PRECISION COSINE TRIGONOMETRIC FUNCTION,
 PRECISION INNER PRODUCT OF TWO VECTORS HAVING COMPLEX ELEMENTS,
 PRECISION REAL ARGUMENT,
 PRECISION REAL ARGUMENT,
 PRECISION REAL ARGUMENT,
 PRECISION REAL ARGUMENT,
 PRECISION SINE TRIGONOMETRIC FUNCTION,
 PRECISION SUMS OF POWERS OF OBSERVATIONS,
 PREDICTOR CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS METHOD OF SUCCESSIVE SUBSTITUTION,
 PRINCIPLE OF SUPERPOSITION, USING SUBROUTINE BLCKDQ TO PERFORM THE SOLUTION OF THE REQUIRED INITIAL
 PRINTER PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) IN THEIR STORED ORDER (ABSCISSA),
 PRINTER PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) AGAINST A SINGLE VARIABLE (ABSCISSA
 PROBLEM PROVIDED DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT,
 PRODUCT OF TWO REAL POLYNOMIALS,
 PRODUCT OF TWO COMPLEX POLYNOMIALS,
 PRODUCT OF TWO VECTORS HAVING COMPLEX ELEMENTS,
 PRODUCT OF TWO VECTORS WHICH MAY BE A COLUMN OR A ROW OF A MATRIX USING EITHER SINGLE OR DOUBLE PREC
 QNWT A NUMBER OF TIMES WITH DIFFERENT INITIAL GUESSES,
 QR ITERATION,
 QR ITERATION,
 QR ITERATION ON A SIMILAR BALANCED HESSENBERG MATRIX,
 QR ITERATION ON A HESSENBERG MATRIX HAVING REAL SUBDIAGONAL ELEMENTS,
 QR ITERATION ON A SIMILAR HESSENBERG MATRIX FOR THE EIGENVALUES AND INVERSE ITERATION FOR THE EIGENV
 QR ITERATION OR LR ITERATION OR THE STURM SEQUENCE METHOD; EIGENVECTORS ARE FOUND BY MEANS OF INVERS
 QUADRATIC EXPRESSION,
 QUADRATIC EXPRESSION,
 QUADRATURE FORMULAS,
 QUADRATURE FORMULAS,
 QUADRATURE FORMULAS,
 QUASI NEWTON METHOD),
 QUOTIENT AND GIVES ERROR BOUNDS,
 QUOTIENT AND REMAINDER OBTAINED BY DIVIDING ONE REAL POLYNOMIAL BY ANOTHER,
 QUOTIENT AND REMAINDER OBTAINED BY DIVIDING ONE COMPLEX POLYNOMIAL BY ANOTHER,
 QUOTIENT FOR A REAL SYMMETRIC MATRIX,
 QUOTIENT SHIFTING COMBINED WITH A STABLE, BAND-PRESERVING DEFLATION TECHNIQUE,
 QUOTIENT U/V,
 QUOTIENT U/V,
 RANDOM FLOATING POINT NUMBERS BETWEEN TWO GIVEN VALUES,
 RANDOM INTEGERS BETWEEN TWO GIVEN VALUES,

F16ITRSPM
 F16ITRSPS
 F16PDL SOS
 F16PDL S OM
 F16PDSFBS
 F16PDSFBM
 F16PDSFBM
 F16SPDFBM
 F16SPDFBS
 F16SPDSOM
 F16SPDSOS
 F16SPITRM
 F16SPITRS
 F13RBESY
 F17SUMPS
 C16VIP
 C12PS1132
 C16VIP
 C12DATAN
 C12DATAN2
 F18LINSYS
 C12CCOS
 F16CINPRD
 C12DEXP
 C12DLOG
 C12DLOG10
 C12DSQRT
 C12DSIN
 F17SUMPS
 F14BLCKDQ
 F14LINBVD
 F17YPLOT
 F17XYPLOT
 F16BSUBHT
 F13MPYR
 F13CMPYR
 F16CINPRD
 C16VIP
 F18QNWT
 F16LATNTR
 F16SYMQR
 F16QREIGN
 F16QR1
 F16VALVEC
 F16TCDIAG
 F13QDIV
 F13CQDIV
 F15HERMIT
 F15LAGUER
 F15LEGEND
 F18QNWT
 F16EIGCHK
 F13PDIV
 F13CPDIV
 F16RAYLGH
 F16BANEIG
 C12ATAN2
 C12ATAN2
 F17XIRAND
 F17IRAND

GENERATES RANDOM INTEGERS HAVING THE POISSON DISTRIBUTION.
 GENERATES RANDOM NUMBERS HAVING A NEGATIVE EXPONENTIAL DISTRIBUTION.
 GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION AND STORES THE VALUES IN A MULTIPLEXED ARRAY.
 GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION.
 GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION, PROVIDING A CONVENIENT WAY OF HANDLING THE TAIL AND STO
 GENERATES RANDOM NUMBERS HAVING UNIFORM OR NORMAL DISTRIBUTION.
 GENERATES RANDOM NUMBERS HAVING A UNIFORM DISTRIBUTION AND STORES THE VALUES AS ONE VARIABLE IN A MULTIPLEXED
 MEDIAN, MINIMUM, MAXIMUM, AND RANGE FOR ONE OR ALL VARIABLES IN A MULTIPLEXED
 LUTION VECTOR WITH THE NEWTON RAPHSON METHOD MODIFYING THIS CORRECTION VECTOR WHEN IT IS TOO LARGE OR WHEN THE CORRECTION DOES NOT
 INEAR EQUATIONS IN THE NEWTON RAPHSON METHOD AND SWITCHING TO THE STEEPEST DESCENT METHOD IF THE FORMER METHOD GIVES DIVERGENCE; I
 EQUATIONS BY USING THE NEWTON RAPHSON METHOD IN THE FIRST ITERATION AND BY UPDATING THE APPROXIMATION OF THE JACOBIAN IN THE NEXT
 N OF A REAL ARGUMENT BY USING RATIONAL APPROXIMATION.
 DIFFERENTIAL EQUATIONS USING A RATIONAL EXTRAPOLATION TECHNIQUE BASED ON A MODIFIED MIDPOINT RULE; EFFICIENT FOR HIGH ACCURACY WORK
 RESOLVES A RATIONAL FUNCTION INTO PARTIAL FRACTIONS GIVEN THE ROOTS OF THE DENOMINATOR POLYNOMIAL AND THE COEFF
 CONSTRUCTS A MINIMAX RATIONAL FUNCTION APPROXIMATION OF GIVEN DEGREE TO A DISCRETE DATA SET.
 TO A SET OF DATA POINTS BY A RATIONAL FUNCTION WITH NUMERATOR AND DENOMINATOR OF A SPECIFIED DEGREE.
 COMPUTES THE INCOMPLETE BETA RATIO.
 FUNCTION OF THE F (VARIANCE RATIO) DISTRIBUTION.
 FUNCTION OF THE F (VARIANCE RATIO) DISTRIBUTION.
 DISTRIBUTION FUNCTION OF THE RAYLEIGH DISTRIBUTION.
 DISTRIBUTION FUNCTION OF THE RAYLEIGH DISTRIBUTION.
 LANDT ITERATION WITH PERIODIC RAYLEIGH QUOTIENT SHIFTING COMBINED WITH A STABLE, BAND-PRESERVING DEFLATION TECHNIQUE.
 RIC MATRIX BY CALCULATING THE RAYLEIGH QUOTIENT AND GIVES ERROR BOUNDS.
 CALCULATES THE RAYLEIGH QUOTIENT FOR A REAL SYMMETRIC MATRIX.
 INATIONS OF A AND B, NTEGER, REAL, COMPLEX, AND DOUBLE PRECISION.
 THE EXPONENTIAL FUNCTION OF A REAL ARGUMENT.
 UNCTION OF A DOUBLE PRECISION REAL ARGUMENT.
 ES THE NATURAL LOGARITHM OF A REAL ARGUMENT.
 GARITHM OF A DOUBLE PRECISION REAL ARGUMENT.
 S THE BASE TEN LOGARITHM OF A REAL ARGUMENT.
 GARITHM OF A DOUBLE PRECISION REAL ARGUMENT.
 COMPUTES THE SQUARE ROOT OF A REAL ARGUMENT.
 RE ROOT OF A DOUBLE PRECISION REAL ARGUMENT.
 COMPUTES THE CUBE ROOT OF A REAL ARGUMENT.
 EX VALUED HANKEL FUNCTION FOR REAL ARGUMENT AND INTEGER ORDER BY SUMMATION OF SERIES FOR BESSEL FUNCTIONS.
 NCTIONS OF THE FIRST KIND FOR REAL ARGUMENT AND INTEGER ORDERS BY USING BACKWARD RECURSION.
 THE SECOND KIND FOR POSITIVE REAL ARGUMENT AND INTEGER ORDERS.
 NCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY USING BACKWARD RECURSION.
 CTIONS OF THE SECOND KIND FOR REAL ARGUMENT BY USING POLYNOMIAL APPROXIMATIONS AND THE SUBROUTINE BESNIS.
 NCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY FORWARD OR BACKWARD RECURSION WITH STARTING VALUES.
 UATES THE GAMMA FUNCTION OF A REAL ARGUMENT BY USING RATIONAL APPROXIMATION.
 EVALUATES A POLYNOMIAL HAVING REAL COEFFICIENTS AT A REAL VALUE OF THE INDEPENDENT VARIABLE BY NESTED MULTIPLICATION.
 ALUATION OF A POLYNOMIAL WITH REAL COEFFICIENTS NEAR ONE OF ITS COMPLEX ROOTS THROUGH FORWARD ERROR ANALYSIS.
 LL ZEROS OF A POLYNOMIAL WITH REAL COEFFICIENTS WITH NEWTONS METHOD OR BAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION
 A REAL MATRIX HAVING DISTINCT REAL EIGENVALUES.
 ION C**R FOR COMPLEX BASE AND REAL EXPONENT.
 RED NUMBER OF REAL ZEROS OF A REAL FUNCTION WITH A METHOD DESCRIBED BY JARRATT AND NUDDS FOR APPROXIMATION OF ONE ZERO AND FACTORI
 A SINGLE REAL EIGENVALUE OF A REAL HESSENBERG MATRIX BY MEANS OF WIELANDT INVERSE ITERATION.
 A SINGLE REAL EIGENVALUE OF A REAL HESSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
 CULATES SOME EIGENVALUES OF A REAL MATRIX BY MEANS OF A MODIFICATION OF LAGUERRES METHOD.
 IMATION OF AN EIGENVALUE OF A REAL MATRIX HAVING DISTINCT REAL EIGENVALUES.
 TRANSFORMS A REAL MATRIX INTO UPPER HESSENBERG FORM ACCORDING TO HOUSEHOLDERS METHOD.
 TRANSFORMS A REAL MATRIX TO UPPER HESSENBERG FORM USING WILKINSONS METHOD.
 ALUES (COMPLEX AND REAL) OF A REAL MATRIX USING HOUSEHOLDERS TRANSFORMATION FOLLOWED BY DOUBLE QR ITERATION.
 OFFICIENTS OF THE SUM OF TWO REAL POLYNOMIALS.
 EVALUATES A REAL POLYNOMIAL AT A COMPLEX POINT BY FACTORIZING WITH A QUADRATIC TERM.
 CH IS THE INTEGRAL OF ANOTHER REAL POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER.
 DIVIDES A REAL POLYNOMIAL BY A LINEAR FACTOR, X+B, WHERE B MAY BE COMPLEX.
 FINDS THE PRODUCT OF TWO REAL POLYNOMIALS.
 NDER OBTAINED BY DIVIDING ONE REAL POLYNOMIAL BY ANOTHER.

F17PORAND
 F17EXRAND
 F17NRAND
 F17NRML
 F17NRMNO
 F17RAND
 F17URAND
 F17DSCR2
 F18NEWT
 F18NRS6
 F18QNW
 F13GAMMA
 F14DRATEX
 F13PARFAC
 F15MINRAT
 F15RATL
 F17BETAR
 F17PFDIST
 F17PIFDIS
 F17PIRAYL
 F17PRAYL
 F16BANEIG
 F16EIGCHK
 F16RAYLGH
 C12PS1132
 C12EXP
 C12DEXP
 C12ALOG
 C12DLOG
 C12ALOG10
 C12DLOG10
 C12SQRT
 C12DSQRT
 C12CBRT
 F13HANKEL
 F13NBESJ
 F13RBESJ
 F13BESNIS
 F13BESNKS
 F13BSJ
 F13GAMMA
 F13EVREAL
 F18NSLVL
 F18PROOT
 F16EIGCO1
 F12CBAREX
 F18ZAFUR
 F16EIGIMP
 F16EIGVCH
 F16EIG5
 F16EIGCO1
 F16SUBDIR
 F16HSSN
 F16LATNTR
 F13ADR
 F13COMPEV
 F13INT
 F13LDIV
 F13MPYR
 F13PDIV

FOR A BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION AND GIV	F16BITERM
FOR A BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION AND GIV	F16BITRPM
FINITE BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT,	F16BITRPD
FOR A BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PIVOTING AND GIVES AN ESTIMATE FOR THE ACCURACY	F16BITWNP
FOR A BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION; THE DE	F16BLESOM
FOR A BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PIVOTING; THE DETERMINANT IS ALSO AVAILABLE,	F16BLSWNP
FINITE BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOSITION,	F16BPDITM
FINITE BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT, POSSIBL	F16BPDFSB
FINITE BANDMATRIX WITH SEVERAL	RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOSITION,	F16BPDFSOM
A COMPLEX MATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION FOLLOWING CROUTS ALGORITHM WITH PARTIAL PIVOT	F16CFBSUM
A COMPLEX MATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PI	F16CGITRF
A COMPLEX MATRIX WITH SEVERAL	RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16CGLESOM
A COMPLEX MATRIX WITH SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTI	F16CITERF
A LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOT	F16FBSSUBM
A LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORI	F16ITERFM
A LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,	F16GLESOM
A LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DA	F16GITRPM
TE LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES PROVIDED DECOMPOSITION WITH CHOLESKYS METHOD HAS BEEN CARRIED OUT AND PROVIDES DAT	F16ITRPSM
TE LINEAR SYSTEM WITH SEVERAL	RIGHT-HAND SIDES PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,	F16ITRSPS
SQUARES PROBLEM WITH SEVERAL	RIGHT-HAND SIDES USING HOUSEHOLDER TRANSFORMATIONS,	F16LSQHTM
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES USING CHOLESKYS DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND	F16PDITRM
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES USING CHOLESKYS DECOMPOSITION,	F16PDLSSOM
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CARRIED OUT	F16PDSFBM
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE,	F16SPDFBS
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTINE,	F16SPDSOS
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION,	F16SPITRS
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES,	F16TRILOS
LINEAR SYSTEM HAVING SEVERAL	RIGHT-HAND SIDES,	F16TRIUPS
HIGH ATTEMPTS TO MINIMIZE THE	RIPPLE IN CURVATURE,	F15RICH
ENTIAL EQUATIONS AS PROCEDURE	RKINIT BUT RUNS FASTER AND REQUIRES MORE STORAGE,	F14NRKUS
OVER A FINITE INTERVAL USING	ROMBERG INTEGRATION,	F15ROMBG
OF PARTIAL FRACTIONS GIVEN THE	ROOTS OF THE DENOMINATOR POLYNOMIAL AND THE COEFFICIENTS OF THE NUMERATOR POLYNOMIAL,	F13PARFAC
EX POLYNOMIAL NEAR ONE OF ITS	ROOTS THROUGH FORWARD ERROR ANALYSIS,	F18CNLSVL
ELEMENTS NEAR ONE OF ITS COMPLEX	ROOTS THROUGH FORWARD ERROR ANALYSIS,	F18NSLVL
WITHOUT CALCULATING A SQUARE	ROOT; THE DETERMINANT IS AVAILABLE,	F16SPDCOM
LINEAR SYSTEM PROVIDED SQUARE	ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,	F16ITRSPM
RIGHT-HAND SIDES PROVIDED SQUARE	ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,	F16ITRSPS
TE LINEAR SYSTEM USING SQUARE	ROOT FREE DECOMPOSITION,	F16SPITRM
RIGHT-HAND SIDES USING SQUARE	ROOT FREE DECOMPOSITION,	F16SPITRS
COMPUTES THE SQUARE	ROOT OF A COMPLEX ARGUMENT,	C12CSQRT
COMPUTES THE SQUARE	ROOT OF A DOUBLE PRECISION REAL ARGUMENT,	C12DSQRT
COMPUTES THE SQUARE	ROOT OF A REAL ARGUMENT,	C12SQRT
COMPUTES THE CUBE	ROOT OF A REAL ARGUMENT,	C12CBRT
USED WITHOUT USING THE SQUARE	ROOT ROUTINE,	F16SPDFBM
USED WITHOUT USING THE SQUARE	ROOT ROUTINE,	F16SPDFBS
STEM WITHOUT USING THE SQUARE	ROOT ROUTINE,	F16SPDSOM
SIDES WITHOUT USING THE SQUARE	ROOT ROUTINE,	F16SPDSOS
ESTIMATES THE	ROUNDING ERROR IN THE EVALUATION OF A COMPLEX POLYNOMIAL NEAR ONE OF ITS ROOTS THROUGH FORWARD ERROR	F18CNLSVL
ESTIMATES THE	ROUNDING ERROR IN THE EVALUATION OF A POLYNOMIAL WITH REAL COEFFICIENTS NEAR ONE OF ITS COMPLEX ROOT	F18NSLVL
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION; ALSO COMPUTES ITS DETERMINANT,	F16CDECOM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE CDECOM,	F16CFBSUM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT; THE DETERMINANT AND CONDITION NUMBER ARE AVAILABLE,	F16CGITRF
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION,	F16CGLESOM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMB	F16CITERF
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE,	F16CDECOM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECOM,	F16DETERM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE DECOM,	F16FBSSUBM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION HAS BEEN CARRIED OUT,	F16FBSSUBS
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION,	F16GLESOM
THM WITH PARTIAL PIVOTING AND	ROW EQUILIBRATION,	F16GLESOS

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S COEFFICIENTS OF THE FOURIER
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ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRI
ROW EQUILIBRATION HAS BEEN CARRIED OUT,
ROW OF A MATRIX USING EITHER SINGLE OR DOUBLE PRECISION; OTHER SUBROUTINES ARE VIPA, VIPS, VIPD, VIP
RULE,
RULE OF A BOUNDED FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL OF EQUISPACED VALUES.
RUNGE KUTTA TECHNIQUE EFFICIENT FOR LOW ACCURACY WORK.
RUNS UP AND DOWN,
RUNS (EXPECTED IN SYMMETRIC DISTRIBUTION AND OBSERVED) ABOVE AND BELOW ZERO OF DIFFERENT LENGTHS FOR
RUNS (EXPECTED AND OBSERVED) UP AND DOWN FOR A SAMPLE,
SAMPLE,
SAMPLE,
SCALAR FUNCTION,
SCHURS METHOD FOR ISOLATING ONE ZERO,
SECANT METHOD MODIFYING THE STEP VECTOR WHEN THE SET OF GUESSES TEND TO BECOME LINEARLY DEPENDENT OR
SECOND KINDS BY USING LANDENS TRANSFORMATION,
SECOND KINDS BY USING LANDENS TRANSFORMATION,
SECOND KINDS FOR COMPLEX ARGUMENT AND COMPLEX ORDER,
SECOND KIND FOR REAL ARGUMENT BY USING POLYNOMIAL APPROXIMATIONS AND THE SUBROUTINE BESNIS,
SECOND KIND FOR POSITIVE REAL ARGUMENT AND INTEGER ORDERS,
SECOND ORDER CONTINUITY,
SECOND ORDER DIFFERENTIAL EQUATION A*X,
SEQUENCE METHOD; EIGENVECTORS ARE FOUND BY MEANS OF INVERSE ITERATION,
SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS,
SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS,
SERIES, GIVEN THE COEFFICIENTS OF THE TRIGONOMETRIC POLYNOMIAL,
SERIES,
SERIES BY USE OF LANCZOS SIGMA FACTORS,
SERIES WITH A LINEAR TREND THROUGH A SET OF EQUISPACED POINTS,
SERIES WITH A LINEAR TREND THAT IS OBTAINED BY INTEGRATION OF A TRIGONOMETRIC POLYNOMIAL,
SERIES WITH LINEAR TREND, IN THE LEAST SQUARES SENSE, TO A SET OF EQUISPACED DATA,
SET OF SUBROUTINES TO CALCULATE THE INNER PRODUCT OF TWO VECTORS WHICH MAY BE A COLUMN OR A ROW OF A
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING AND IMPLICIT EQ
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING AND IMPLICIT EQ
SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT,
SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PIVOTING AND GIVES AN ESTIMATE FOR THE A
SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION
SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PIVOTING; THE DETERMINANT IS ALSO AVAILA
SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOSITION,
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT,
SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIANGULAR DECOMPOSITION,
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION FOLLOWING CROUTS ALGORITHM WITH PARTI
SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PA
SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIA
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTI
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUT
SEVERAL RIGHT-HAND SIDES ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION,
SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION AND PRO
SEVERAL RIGHT-HAND SIDES PROVIDED DECOMPOSITION WITH CHOLESKYS METHOD HAS BEEN CARRIED OUT AND PROV
SEVERAL RIGHT-HAND SIDES PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT,
SEVERAL RIGHT-HAND SIDES USING HOUSEHOLDER TRANSFORMATIONS,
SEVERAL RIGHT-HAND SIDES USING CHOLESKYS DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMI
SEVERAL RIGHT-HAND SIDES USING CHOLESKY DECOMPOSITION,
SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY DECOMPOSITION HAS BEEN CAR

F16INVERS
F16INVTR
F16GITRFM
F16GITRFS
F16ITERIN
C16VIP
F15SIMPRC
F15PARBC
F14RKINIT
F17CHIRUD
F17RUNSAB
F17RUNSUD
F17RUNSAB
F17RUNSUD
F11FFRAC
F18HELP
F18NONLIQ
F13ELK
F13ELF
F13COMBES
F13BESNKS
F13RBESY
F15COMCUB
F16DEIG
F16TCDIAG
F16SEPAR
F16SEPAR2
F15TRGDIF
F13ERF
F15SIGSMT
F15FOURI
F15TRGINT
F15FOURAP
C16VIP
F16BFBANP
F16BFBSUM
F16BITRNP
F16BITERM
F16BITRFM
F16BITRPD
F16BITWNP
F16BLESOM
F16BLSWNP
F16BPDITM
F16BPDFSB
F16BPD SOM
F16CFBSUM
F16CGITRF
F16CGLESM
F16CITERF
F16FB SUBM
F16ITERFM
F16GLESOM
F16GITRFM
F16ITRPDS
F16ITRSPS
F16LSQHTM
F16PDITRM
F16PDL SOM
F16PDSFBM

DEFINITE LINEAR SYSTEM HAVING
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ANGULAR LINEAR SYSTEM HAVING
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X MATRIX BY MEANS OF DIAGONAL
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CONSTRUCTS COEFFICIENTS OF A
EVALUATES A
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COMPUTES THE DOUBLE PRECISION
COMPUTES THE COMPLEX
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SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE.
SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTINE.
SEVERAL RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION.
SEVERAL RIGHT-HAND SIDES.
SEVERAL RIGHT-HAND SIDES.
SHIFTING COMBINED WITH A STABLE, BAND-PRESERVING DEFLATION TECHNIQUE.
SIGMA FACTORS.
SIMILARITY TRANSFORMATIONS.
SIMPSONS RULE.
SIMPSONS RULE OF A BOUNDED FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL OF EQUISPACED VALUES.
SINE AND COSINE INTEGRALS USING CHEBYSHEV APPROXIMATIONS.
SINE POLYNOMIAL WITH A LINEAR TREND GIVEN A SET OF (ABSCISSA, ORDINATE) PAIRS WITH ARBITRARY SPACING
SINE POLYNOMIAL AT A GIVEN POINT.
SINE TRIGONOMETRIC FUNCTION.
SINE TRIGONOMETRIC FUNCTION.
SINE TRIGONOMETRIC FUNCTION.
SINE TRIGONOMETRIC FUNCTION.
SINE TRIGONOMETRIC FUNCTION.
SINGLE COMPLEX QR ITERATION ON A HESSENBERG MATRIX HAVING REAL SUBDIAGONAL ELEMENTS.
SINGLE OR DOUBLE PRECISION; OTHER SUBROUTINES ARE VIPA, VIPS, VIPD, VIPDA, VIPDS, INRPRD, PRDSUM.
SKEWNESS AND KURTOSIS FOR MULTIPLEXED ARRAYS.
SMOOTHING IS OBTAINED BY EVALUATING THE LEAST SQUARES POLYNOMIAL OF DEGREE N BASED ON SUCCESSIVE POINTS.
SMOOTHING OF A FOURIER SERIES BY USE OF LANCZOS SIGMA FACTORS.
SMOOTHING OF A TWO DIMENSIONAL DATA SET BY MOVING EACH OF THE INPUT DATA POINTS TOWARD A CUBIC THROUGH
SMOOTH A SET OF DATA; EACH SMOOTHED ORDINATE IS OBTAINED AS A WEIGHTED AVERAGE OF A SPECIFIED NUMBER
SMOOTH SURFACE WITH CONTINUOUS FIRST PARTIAL DERIVATIVES TO A SET OF POINTS DEFINED OVER A RECTANGULAR
SOLUTION OF A LEAST SQUARES PROBLEM PROVIDED DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED
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SOLVES AN UPPER TRIANGULAR LINEAR SYSTEM.
SOLVES AN UPPER TRIANGULAR LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES.
SOLVES A LEAST SQUARES PROBLEM PROVIDED DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT.
SOLVES A LEAST SQUARES PROBLEM FOR A COMPLEX SYSTEM USING THE METHOD OF CONJUGATE GRADIENT.
SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMP
SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMP
SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH
SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH
SOLVES A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED
SOLVES A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED
SOLVES A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DE
SOLVES A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH
SOLVES A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO
SOLVES A LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL
SOLVES A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIV
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SOLVES A LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE D
SOLVES A LINEAR SYSTEM USING CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE.
SOLVES A LINEAR LEAST SQUARES PROBLEM USING HOUSEHOLDER TRANSFORMATIONS.
SOLVES A LINEAR LEAST SQUARES PROBLEM WITH SEVERAL RIGHT-HAND SIDES USING HOUSEHOLDER TRANSFORMATION
SOLVES A LINEAR SYSTEM FOR A LARGE SPARSE RECTANGULAR MATRIX USING THE CONJUGATE GRADIENT METHOD.
SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITH PARTIAL PIVOTING HAS BEEN
SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX USING PARTIAL PIVOTING.
SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITHOUT PIVOTING HAS BEEN CAR
SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX WITHOUT PIVOTING.
SOLVES A LOWER TRIANGULAR LINEAR SYSTEM.
SOLVES A LOWER TRIANGULAR LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES.
SOLVES A POSITIVE DEFINITE LINEAR SYSTEM PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE
SOLVES A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN
SOLVES A POSITIVE DEFINITE LINEAR SYSTEM WITHOUT USING THE SQUARE ROOT ROUTINE.
SOLVES A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT
SOLVES A RECTANGULAR LINEAR REAL SYSTEM IN THE SENSE OF LEAST SQUARES ACCORDING TO THE CONJUGATE GRADIENT

F16SPDFBS
F16SPDSOS
F16SPITRS
F16TRILOS
F16TRIUPS
F16BANEIG
F15SIGSMT
F16BALANC
F15SIMPRC
F15PARBC
F13SICI
F15SINER
F15SINEVL
C12SIN
C12DSIN
C12CSIN
C12SINH
F16QR1
C16VIP
F17DSCRPT
F15SMOOTH
F15SIGSMT
F15SMOCUB
F15MILN2
F15SURFS
F16ITRLSQ
F16NRS6
F16NRS6
F16TRIUPM
F16TRIUPS
F16BSUBHT
F16CCONGR
F16BFBANP
F16BFBSUM
F16BLESOM
F16BLSWNP
F16BPDFSB
F16BPDOSM
F16CFBSUM
F16CGLESM
F16FBSUBM
F16FBSUBS
F16GLESOM
F16GLESOS
F16LESWNE
F16LESWNP
F16LSQHTS
F16LSQHTM
F16SCONG
F16TRDFBM
F16TRDSOM
F16TRDSUB
F16TRDWNP
F16TRILOM
F16TRILOS
F16SPDFBM
F16SPDFBS
F16SPDSOM
F16SPDSOS
F16FCGM2

SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM USING CHOLESKY DECOMPOSITION.	F16PDL50S
SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY DE	F16PDL50M
SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY	F16PDSFBS
SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGUL	F16PDSFBM
SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A PREDICTOR CORRECTOR METHOD OF	F14BLCKDQ
SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A RATIONAL EXTRAPOLATION TECHNI	F14DRATEX
SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A VARIABLE STEP RUNGE KUTTA TEC	F14RKINIT
SOLVES A SYSTEM OF NONLINEAR EQUATIONS BY COMPUTING IN EACH ITERATION A CORRECTION VECTOR TO THE TRI	F18NEWIT
SOLVES A SYSTEM OF LINEAR EQUATIONS OR SEVERAL SYSTEMS WITH THE SAME LEFT HAND SIDE BY GAUSSIAN ELIM	F18LINSYS
SOLVES A SYSTEM OF NONLINEAR ALGEBRAIC EQUATIONS USING THE GENERALIZED SECANT METHOD MODIFYING THE S	F18NONLIQ
SOLVES A SYSTEM OF NONLINEAR EQUATIONS BY USING THE NEWTON RAPHSON METHOD IN THE FIRST ITERATION AND	F18QNWIT
SOLVES A SYSTEM OF NONLINEAR EQUATIONS BY CALLING SUBROUTINE QNWT A NUMBER OF TIMES WITH DIFFERENT I	F18QNWIT
SOLVES DIFFERENTIAL EQUATIONS AS PROCEDURE RKINIT BUT RUNS FASTER AND REQUIRES MORE STORAGE.	F14NRKUS
SOLVES LINEAR BOUNDARY VALUE PROBLEMS IN A SYSTEM OF ORDINARY DIFFERENTIAL EQUATIONS, WHERE THE SOLU	F14LINBVD
SOLVES NONLINEAR BOUNDARY VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS BY COMBINING AN INITIAL	F14BVD
SOLVES THE EIGENSYSTEM FOR THE SECOND ORDER DIFFERENTIAL EQUATION A*X.	F16DEIG
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROV	F16BITRNP
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROV	F16BITERM
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USIN	F16BITRFM
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH S	F16BITRPD
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USIN	F16BITWNP
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH S	F16BPDITM
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES	F16CGITRF
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES	F16CITERF
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR	F16ITERFM
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SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORIT	F16GITRFM
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND RO	F16GITRFS
SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM PROVIDED DECOMPOSITION	F16ITRPDM
SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND	F16ITRPDS
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SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND	F16ITRSPS
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SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CROUTS ALGORITHM WITHOUT PIVOTING AND PROVIDE	F16LITWNP
SOLVES WITH ITERATIVE REFINEMENT A LINEAR LEAST SQUARES PROBLEM USING HOUSEHOLDERS METHOD.	F16LSQSI
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CHOLESKY DECOMPOSITION AND PROVIDES DATA FOR	F16PDITRS
SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKYS DEC	F16PDITRM
SOLVES WITH ITERATIVE REFINEMENT A POSITIVE DEFINITE LINEAR SYSTEM USING SQUARE ROOT FREE DECOMPOSIT	F16SPITRM
SOLVES WITH ITERATIVE REFINEMENT A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES U	F16SPITRS
SORTS THE VALUES OF ONE VARIABLE IN A MULTIPLEXED ARRAY IN INCREASING ORDER.	F17VARORD
UBROUTINE TO MULTIPLY A LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT.	C16SMVX
O MULTIPLY A TRANSPOSED LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT.	C16SMTVX
S A LINEAR SYSTEM FOR A LARGE SPARSE RECTANGULAR MATRIX USING THE CONJUGATE GRADIENT METHOD.	F16SCONG
COMPUTES A SWQUENCE OF SPHERICAL BESSEL FUNCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY FORWARD OR BACKWARD RECURSION WITH	F13BSJ
CONSTRUCTS A FIFTH DEGREE SPLINE INTERPOLATING A SET OF EQUISPACED DATA.	F15SPLINE
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TRUCTS, IN THE SENSE OF LEAST SQUARES THROUGH THE WHOLE DATA SET.	F15SMOCUB
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CONSTRUCTS A LEAST SQUARES POLYNOMIAL APPROXIMATION OF SOME PREASSIGNED DEGREE TO A SET OF DATA POINTS WITH GIVEN WEIGH	F15FLSQFY
CONSTRUCTS A LEAST SQUARES POLYNOMIAL OF A SPECIFIED DEGREE WHOSE GRAPH APPROXIMATES A SET OF DATA POINTS WITH WEIGHT A	F15FDLSQ
AINED BY EVALUATING THE LEAST SQUARES POLYNOMIAL OF DEGREE N BASED ON SUCCESSIVE POINTS.	F15FCLSQ
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SOLVES A LEAST SQUARES PROBLEM FOR A COMPLEX SYSTEM USING THE METHOD OF CONJUGATE GRADIENT.	F16BSUBHT
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SOLVES A LINEAR LEAST SQUARES PROBLEM USING HOUSEHOLDER TRANSFORMATIONS.	F16ITRLSQ
SOLVES A LINEAR LEAST SQUARES PROBLEM WITH SEVERAL RIGHT-HAND SIDES USING HOUSEHOLDER TRANSFORMATIONS.	F16LSQHTM

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SQUARES SENSE, TO A SET OF EQUISPACED DATA,
SQUARES SOLUTION OF THE SYSTEM OF LINEAR EQUATIONS IN THE NEWTON RAPHSON METHOD AND SWITCHING TO THE
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SQUARE ROOT; THE DETERMINANT IS AVAILABLE,
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SQUARE ROOT FREE DECOMPOSITION,
SQUARE ROOT OF A REAL ARGUMENT,
SQUARE ROOT OF A DOUBLE PRECISION REAL ARGUMENT,
SQUARE ROOT OF A COMPLEX ARGUMENT,
SQUARE ROOT ROUTINE,
SQUARE ROOT ROUTINE,
SQUARE ROOT ROUTINE,
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SQUARE ROOT ROUTINE,
SQUARE TEST-STATISTIC FOR GIVEN EXPECTED AND OBSERVED FREQUENCIES,
SQUARE TEST FOR GOODNESS OF FIT,
SQUARE TEST FOR SYMMETRY ABOUT ZERO,
SQUARE TEST FOR RUNS UP AND DOWN,
STANDARD DEVIATIONS, VARIANCES, AND COEFFICIENTS OF SKEWNESS AND KURTOSIS FOR MULTIPLEXED ARRAYS,
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STEEPEST DESCENT METHOD IF THE FORMER METHOD GIVES DIVERGENCE; IN THE STEP VECTOR DIRECTION THE OPTI
STEP VECTOR IS CALCULATED BY PARABOLIC INTERPOLATION,
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SUBSET OF EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX USING THE STURM SEQUENCE PROPERTY OF THE DET
SUBSTITUTION ON THE EIGENVECTORS OF A HESSENBERG MATRIX PROVIDED THE TRANSFORMATION TO HESSEBERG FOR
SUBTRACTS THE MEAN FROM EACH OBSERVATION OF A SET,
SUBTRACT A CONSTANT TIMES A VECTOR FROM ANOTHER VECTOR,
SUBTRACT FROM A VECTOR ITS COMPONENT ALONG ANOTHER VECTOR,
SUMS OF POWERS OF OBSERVATIONS,
SUM OF TWO COMPLEX POLYNOMIALS,
SUM OF TWO REAL POLYNOMIALS,
SUPERPOSITION, USING SUBROUTINE BLCKDQ TO PERFORM THE SOLUTION OF THE REQUIRED INITIAL VALUE PROBLEM
SURFACE WITH CONTINUOUS FIRST PARTIAL DERIVATIVES TO A SET OF POINTS DEFINED OVER A RECTANGULAR GRID
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SYMMETRIC MATRIX BY CALCULATING THE RAYLEIGH QUOTIENT AND GIVES ERROR BOUNDS,
SYMMETRIC MATRIX,
SYMMETRIC MATRIX,
SYMMETRIC MATRIX INTO TRIDIAGONAL FORM USING HOUSEHOLDERS TRANSFORMATION,
SYMMETRIC POSITIVE DEFINITE BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS,
SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITI
SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE
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F18NRS G
F17CHIPRB
F17PICH I
F16SPDCOM
F16ITRSPM
F16ITRSPS
F16SPITRM
F16SPITRS
C12SQRT
C12DSQRT
C12CSQRT
F16SPDFBM
F16SPDFBS
F16SPDSOM
F16SPDSOS
F17CHSQO
F17CHIDST
F17CHIRAB
F17CHIRUD
F17DSCRPT
F18CPOLRT
F18NRS G
F18NRS G
F17PIT
F17PTDIST
F16SEPAR
F16SEPAR2
F16TCDIAG
F16QR1
F16SEPAR2
F16SIMP
F17ZRNM
C16FCOMB
C16FPUR
F17SUMPS
F13CADR
F13ADR
F14LINBVD
F15SURFS
F16BANEIG
F17RUNSAB
F16EIGCHK
F16EIGSYM
F16RAYLGH
F16TRIDI
F16BCHSDC
F16BITRPO
F16BPDITM
F16BPDFSB
F16BPOSOM
F16CHSDEC
F16ITRPDM
F16ITRPDS
F16ITRSPM
F16ITRSPS
F16PDL SOS
F16PDL SOM
F16PDFBS

SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION	F16PDSFBM
DECOMPOSES A SYMMETRIC POSITIVE DEFINITE MATRIX INTO LOWER TRIANGULAR, DIAGONAL AND UPPER TRIANGULAR FACTORS WITH	F16SPDCOM
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VECTOR FROM ANOTHER VECTOR.
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VECTOR MULTIPLICATION.
VECTOR ON THE RIGHT.
VECTOR ON THE RIGHT.
VECTOR WITH FRACTIONAL COMPONENTS INTO ONE WITH INTEGER COMPONENTS TIMES A SCALAR FUNCTION.
VIPA, VIPS, VIPD, VIPDA, VIPDS, INRPRD, PRDSUM.
VIPDA, VIPDS, INRPRD, PRDSUM.
VIPS, VIPS, INRPRD, PRDSUM.
VIPD, VIPDA, VIPDS, INRPRD, PRDSUM.
VIPS, VIPD, VIPDA, VIPDS, INRPRD, PRDSUM.
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WEIBULL DISTRIBUTION.
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ZEROS OF A COMPLEX POLYNOMIAL BY APPLYING STEEPEST DESCENT WITH ACCELERATION DEVICES AND USING EXPL
ZEROS OF A COMPLEX POLYNOMIAL BY LEHMERS METHOD USING SCHURS METHOD FOR ISOLATING ONE ZERO.

C12ATAN
C12ATAN2
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C12DATAN2
C12SINH
C12TANH
F15TRGDI
F15TRGINT
F17PTRNM
F17PTRNR
F15TBLU2
F17PIT
F17PTDIST
F17PIUNF
F17PIUNFD
F17PRBUNF
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F17URAND
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F17IRAND
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F18ONWT
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F16TRIUPS
F16TRUPIN
F14BVD
F14LINBVD
F17DSCRPT
F17CORCOV
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F16CINPRD
C16VIP
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C16FMVCX
C16FMTVCX
C16FABSV
C16FCOMB
C16FNORM1
C16FPUR
C16FMVX
C16SMVX
C16SMTVX
F11FFRAC
C16VIP
C16VIP
C16VIP
C16VIP
C16VIP
F17PIWEBL
F17PWEBL
F15MILN2
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ZEROS OF A COMPLEX FUNCTION WITH MULLERS METHOD AND FACTORING OUT PREVIOUSLY FOUND ZEROS,
ZEROS OF A POLYNOMIAL WITH REAL COEFFICIENTS WITH NEWTONS METHOD OR BAIRSTOWS METHOD BY PERFORMING S
ZEROS OF A REAL FUNCTION WITH A METHOD DESCRIBED BY JARRATT AND NUDDS FOR APPROXIMATION OF ONE ZERO
ZEROS OR A SINGLE ZERO OF A COMPLEX POLYNOMIAL BY MULLERS METHOD WITH DEFLATION,

F18ZAFUJ
F18ZAFUM
F18PROOT
F18ZAFUR
F18MULLP

C12ACOS COMPUTES THE ARCOSINE TRIGONOMETRIC FUNCTION.
C12ALOG10 COMPUTES THE BASE TEN LOGARITHM OF A REAL ARGUMENT.
C12ALOG COMPUTES THE NATURAL LOGARITHM OF A REAL ARGUMENT.
C12ASIN COMPUTES THE ARCSINE TRIGONOMETRIC FUNCTION.
C12ATAN2 COMPUTES THE ARCTANGENT TRIGONOMETRIC FUNCTION OF A QUOTIENT U/V.
C12ATAN COMPUTES THE ARCTANGENT TRIGONOMETRIC FUNCTION.
C12CBRT COMPUTES THE CUBE ROOT OF A REAL ARGUMENT.
C12CCOS COMPUTES THE COMPLEX COSINE TRIGONOMETRIC FUNCTION.
C12CEXP COMPUTES THE EXPONENTIAL FUNCTION OF A COMPLEX ARGUMENT.
C12CLOG COMPUTES THE NATURAL LOGARITHM OF A COMPLEX ARGUMENT.
C12COS COMPUTES THE COSINE TRIGONOMETRIC FUNCTION.
C12CSIN COMPUTES THE COMPLEX SINE TRIGONOMETRIC FUNCTION.
C12CSQRT COMPUTES THE SQUARE ROOT OF A COMPLEX ARGUMENT.
C12DATAN2 COMPUTES THE DOUBLE PRECISION ARCTANGENT TRIGONOMETRIC FUNCTION OF A QUOTIENT U/V.
C12DATAN COMPUTES THE DOUBLE PRECISION ARCTANGENT TRIGONOMETRIC FUNCTION.
C12DCOS COMPUTES THE DOUBLE PRECISION COSINE TRIGONOMETRIC FUNCTION.
C12DEXP COMPUTES THE EXPONENTIAL FUNCTION OF A DOUBLE PRECISION REAL ARGUMENT.
C12DLOG10 COMPUTES THE BASE TEN LOGARITHM OF A DOUBLE PRECISION REAL ARGUMENT.
C12DLOG COMPUTES THE NATURAL LOGARITHM OF A DOUBLE PRECISION REAL ARGUMENT.
C12DSIN COMPUTES THE DOUBLE PRECISION SINE TRIGONOMETRIC FUNCTION.
C12DSQRT COMPUTES THE SQUARE ROOT OF A DOUBLE PRECISION REAL ARGUMENT.
C12EXP COMPUTES THE EXPONENTIAL FUNCTION OF A REAL ARGUMENT.
C12PS1132 A SET OF PROGRAMS TO PERFORM GENERAL EXPONENTIATION, A**B, FOR VARIOUS COMBINATIONS OF A AND B, INTEGER, REAL, COMPLEX, AND DOUBLE PRECISION.
C12SINH COMPUTES THE HYPERBOLIC SINE TRIGONOMETRIC FUNCTION.
C12SIN COMPUTES THE SINE TRIGONOMETRIC FUNCTION.
C12SQRT COMPUTES THE SQUARE ROOT OF A REAL ARGUMENT.
C12TANH COMPUTES THE HYPERBOLIC TANGENT TRIGONOMETRIC FUNCTION.
C12TAN COMPUTES THE TANGENT TRIGONOMETRIC FUNCTION.
C16FABSV MATRIARCH SUBROUTINE TO COMPUTE THE EUCLIDIAN NORM OF A VECTOR.
C16FCOMB MATRIARCH SUBROUTINE TO SUBTRACT A CONSTANT TIMES A VECTOR FROM ANOTHER VECTOR.
C16FMMX MATRIARCH SUBROUTINE TO PERFORM A MATRIX MATRIX MULTIPLICATION.
C16FMTMX MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED MATRIX BY A MATRIX ON THE RIGHT.
C16FMTR MATRIARCH SUBROUTINE TO TRANSPOSE A RECTANGULAR MATRIX.
C16FMTVCX MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED COMPLEX MATRIX BY A COMPLEX VECTOR.
C16FMTVX MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED MATRIX BY A VECTOR.
C16FMVCX MATRIARCH SUBROUTINE TO MULTIPLY A COMPLEX MATRIX BY A COMPLEX VECTOR.
C16FMVX MATRIARCH SUBROUTINE TO DO A MATRIX VECTOR MULTIPLICATION.
C16FNORM1 MATRIARCH SUBROUTINE TO NORMALIZE A VECTOR IN THE 2 NORM.
C16FPUR MATRIARCH SUBROUTINE TO SUBTRACT FROM A VECTOR ITS COMPONENT ALONG ANOTHER VECTOR.
C16SMTVX MATRIARCH SUBROUTINE TO MULTIPLY A TRANSPOSED LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT.
C16SMVX MATRIARCH SUBROUTINE TO MULTIPLY A LARGE SPARSE MATRIX BY A VECTOR ON THE RIGHT.
C16VIP ONE OF A SET OF SUBROUTINES TO CALCULATE THE INNER PRODUCT OF TWO VECTORS WHICH MAY BE A COLUMN OR A ROW OF A MATRIX USING EITHER SINGLE OR DOUBLE PRECISION; OTHER SUBROUTINES ARE VIPA, VIPS, VIPD, VIPDA, VIPDS, INRPRD, PRDSUM.
F11FAFRAC ADDS TWO FRACTIONS AND EXPRESSES THE RESULT AS A FRACTION IN ITS LOWEST TERMS.
F11FFRAC CHANGES A VECTOR WITH FRACTIONAL COMPONENTS INTO ONE WITH INTEGER COMPONENTS TIMES A SCALAR FUNCTION.
F11FMFRAC MULTIPLIES TWO FRACTIONS AND EXPRESSES THE RESULT AS A FRACTION IN ITS LOWEST TERMS.
F11HCF FINDS THE HIGHEST COMMON FACTOR OF TWO INTEGERS BY EUCLID'S ALGORITHM.
F11LCM FINDS THE LEAST COMMON MULTIPLE OF TWO INTEGERS BY USING SUBROUTINE HCF.
F12CBAREX EVALUATES GENERAL EXPONENTIATION C**R FOR COMPLEX BASE AND REAL EXPONENT.
F12COSH COMPUTES THE HYPERBOLIC COSINE TRIGONOMETRIC FUNCTION.
F13ADR COMPUTES THE COEFFICIENTS OF THE SUM OF TWO REAL POLYNOMIALS.
F13AMCON PROVIDES CERTAIN MACHINE AND MATHEMATICAL CONSTANTS AS SINGLE PRECISION NUMBERS OF MAXIMUM ACCURACY.
F13BESNIS COMPUTES A SEQUENCE OF MODIFIED BESSEL FUNCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY USING BACKWARD RECURSION.
F13BESNKS COMPUTES A SEQUENCE OF MODIFIED BESSEL FUNCTIONS OF THE SECOND KIND FOR REAL ARGUMENT BY USING POLYNOMIAL APPROXIMATIONS AND THE SUBROUTINE BESNIS.
F13BSJ COMPUTES A SEQUENCE OF SPHERICAL BESSEL FUNCTIONS OF THE FIRST KIND FOR REAL ARGUMENT BY FORWARD OR BACKWARD RECURSION WITH STARTING VALUES.
F13CADR COMPUTES THE COEFFICIENTS OF THE SUM OF TWO COMPLEX POLYNOMIALS.

F13CCOMPE EVALUATES A POLYNOMIAL HAVING COMPLEX COEFFICIENTS AT A COMPLEX POINT BY SUMMING THE PRODUCT OF THE POWERS TIMES THE COEFFICIENTS.
 F13CDERIV COMPUTES THE COEFFICIENTS OF A POLYNOMIAL WHICH IS THE DERIVATIVE OF ANOTHER COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,

F13CEL3 COMPUTES THE COMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND BY THE LANDEN TRANSFORMATION.
 F13CINT COMPUTES THE COEFFICIENTS OF A POLYNOMIAL WHICH IS THE INTEGRAL OF ANOTHER COMPLEX POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
 F13CLDIV DIVIDES A COMPLEX POLYNOMIAL BY A LINEAR FACTOR, $X+B$, WHERE B MAY BE COMPLEX.
 F13CMPYR FINDS THE PRODUCT OF TWO COMPLEX POLYNOMIALS.
 F13COMBES COMPUTES SEQUENCES OF THE BESSEL FUNCTIONS OF THE FIRST OR SECOND KINDS FOR COMPLEX ARGUMENT AND COMPLEX ORDER.
 F13COMPEV EVALUATES A REAL POLYNOMIAL AT A COMPLEX POINT BY FACTORIZING WITH A QUADRATIC TERM.
 F13CPDIV PROVIDES THE QUOTIENT AND REMAINDER OBTAINED BY DIVIDING ONE COMPLEX POLYNOMIAL BY ANOTHER.
 F13CPTRAN EFFECTS A COORDINATE TRANSLATION IN THE ARGUMENT OF A COMPLEX POLYNOMIAL.
 F13CQDIV DIVIDES A COMPLEX POLYNOMIAL BY A QUADRATIC EXPRESSION.
 F13CREV REVERSES THE ORDER OF COMPLEX POLYNOMIAL COEFFICIENTS IN AN ARRAY.
 F13CSBR COMPUTES THE COEFFICIENTS OF THE DIFFERENCE OF TWO COMPLEX POLYNOMIALS.
 F13CSHRNK COMPUTES THE COEFFICIENTS OF THE COMPLEX POLYNOMIAL $P(AX)$ FROM THE COEFFICIENTS OF $P(X)$.
 F13DERIV COMPUTES THE COEFFICIENTS OF A POLYNOMIAL WHICH IS THE DERIVATIVE OF ANOTHER REAL POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
 F13EL3 EVALUATES THE INCOMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND BY USING THE GAUSS TRANSFORMATION; COULD BE USED FOR COMPLETE ELLIPTIC INTEGRAL OF THE THIRD KIND SOMETIMES.
 F13ELF EVALUATES THE INCOMPLETE ELLIPTIC INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION.
 F13ELK EVALUATES THE COMPLETE ELLIPTIC INTEGRAL OF THE FIRST AND SECOND KINDS BY USING LANDENS TRANSFORMATION.
 F13ERFINV COMPUTES THE INVERSE OF THE ERROR FUNCTION BY NEWTONS METHOD.
 F13ERF COMPUTES THE ERROR FUNCTION BY EXPANSION IN CHEBYSHEV SERIES.
 F13EVREAL EVALUATES A POLYNOMIAL HAVING REAL COEFFICIENTS AT A REAL VALUE OF THE INDEPENDENT VARIABLE BY NESTED MULTIPLICATION.
 F13FMULT1 MULTIPLIES A POLYNOMIAL BY A LINEAR FACTOR.
 F13GAMMA EVALUATES THE GAMMA FUNCTION OF A REAL ARGUMENT BY USING RATIONAL APPROXIMATION.
 F13HANKEL EVALUATES THE COMPLEX VALUED HANKEL FUNCTION FOR REAL ARGUMENT AND INTEGER ORDER BY SUMMATION OF SERIES FOR BESSEL FUNCTIONS.
 F13INT COMPUTES THE COEFFICIENTS OF A POLYNOMIAL WHICH IS THE INTEGRAL OF ANOTHER REAL POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER.
 F13LDIV DIVIDES A REAL POLYNOMIAL BY A LINEAR FACTOR, $X+B$, WHERE B MAY BE COMPLEX.
 F13LOGGAM COMPUTES THE NATURAL LOGARITHM OF THE GAMMA FUNCTION FOR COMPLEX ARGUMENT BY USING CONTINUED FRACTIONS.
 F13MPYR FINDS THE PRODUCT OF TWO REAL POLYNOMIALS.
 F13NBESJ COMPUTES BESSEL FUNCTIONS OF THE FIRST KIND FOR REAL ARGUMENT AND INTEGER ORDERS BY USING BACKWARD RECURSION.
 F13PARFAC RESOLVES A RATIONAL FUNCTION INTO PARTIAL FRACTIONS GIVEN THE ROOTS OF THE DENOMINATOR POLYNOMIAL AND THE COEFFICIENTS OF THE NUMERATOR OR POLYNOMIAL.
 F13PDIV PROVIDES THE QUOTIENT AND REMAINDER OBTAINED BY DIVIDING ONE REAL POLYNOMIAL BY ANOTHER.
 F13PTRAN EFFECTS A COORDINATE TRANSLATION IN THE ARGUMENT OF A REAL POLYNOMIAL.
 F13QDIV DIVIDES A REAL POLYNOMIAL BY A QUADRATIC EXPRESSION.
 F13RBESY COMPUTES A SEQUENCE OF BESSEL FUNCTIONS OF THE SECOND KIND FOR POSITIVE REAL ARGUMENT AND INTEGER ORDERS.
 F13REV REVERSES THE ORDER OF REAL POLYNOMIAL COEFFICIENTS IN AN ARRAY.
 F13SBR COMPUTES THE COEFFICIENTS OF THE DIFFERENCE OF TWO REAL POLYNOMIALS.
 F13SHRINK COMPUTES THE COEFFICIENTS OF THE REAL POLYNOMIAL $P(AX)$ FROM THE COEFFICIENTS OF $P(X)$.
 F13SICI EVALUATES THE SINE AND COSINE INTEGRALS USING CHEBYSHEV APPROXIMATIONS.
 F14BLCKDQ SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A PREDICTOR CORRECTOR METHOD OF EIGHTH ORDER AND PICARDS METHOD OF SUCCESSIVE SUBSTITUTION.
 F14BVD SOLVES NONLINEAR BOUNDARY VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS BY COMBINING AN INITIAL VALUE SOLVER WITH A NONLINEAR EQUATION SOLVING PROGRAM.
 F14DRATEX SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A RATIONAL EXTRAPOLATION TECHNIQUE BASED ON A MODIFIED MIDPOINT RULE; EFFICIENT FOR HIGH ACCURACY WORK.
 F14LINBVD SOLVES LINEAR BOUNDARY VALUE PROBLEMS IN A SYSTEM OF ORDINARY DIFFERENTIAL EQUATIONS, WHERE THE SOLUTION IS BASED ON THE PRINCIPLE OF SUPERPOSITION, USING SUBROUTINE BLCKDQ TO PERFORM THE SOLUTION OF THE REQUIRED INITIAL VALUE PROBLEMS.
 F14NRKUS SOLVES DIFFERENTIAL EQUATIONS AS PROCEDURE RKINIT BUT RUNS FASTER AND REQUIRES MORE STORAGE.
 F14RKINIT SOLVES A SYSTEM OF FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS USING A VARIABLE STEP RUNGE KUTTA TECHNIQUE EFFICIENT FOR LOW ACCURACY WORK.
 F15ACFI PERFORMS A SINGLE CONTINUED FRACTION INTERPOLATION USING INVERTED DIFFERENCES ON TABULAR DATA WITH ARBITRARY SPACING.
 F15AITKEN COMPUTES BY AITKENS METHOD THE POLYNOMIAL INTERPOLATED VALUE AT A GIVEN ABSCISSA, GIVEN N POINTS TO FIT EXACTLY BY A POLYNOMIAL OF DEGREE $N-1$ ($N < 11$).
 F15CFQME CONSTRUCTS, USING THE EXCHANGE ALGORITHM, THE MINIMAX POLYNOMIAL THROUGH A DISCRETE, WEIGHTED SET OF POINTS.
 F15CHEBAP CONSTRUCTS THE COEFFICIENTS OF THE CHEBYCHEFF POLYNOMIAL THAT GIVES A CLOSE APPROXIMATION TO A MINIMAX FIT OF A GIVEN FUNCTION OVER A GIVEN INTERVAL.
 F15COMCUB CONSTRUCTS CUBIC SPLINE THROUGH N POINTS; MONOTONE ABSCISSAS REQUIRED; SECOND ORDER CONTINUITY.
 F15COSEVL EVALUATES A COSINE POLYNOMIAL AT A GIVEN POINT.

F15DERIV CONSTRUCTS COEFFICIENTS OF A POLYNOMIAL WHICH IS THE DERIVATIVE OF ANOTHER POLYNOMIAL GIVEN THE COEFFICIENTS OF THE LATTER,
 F15DIFTAB DIFFERENTIATES NUMERICALLY A FUNCTION GIVEN AS A TABLE WITH EQUISPACED ARGUMENTS, AT A TABULAR POINT OR AT THE MIDPOINT OF AN INTERVAL.

F15FCLSQ CONSTRUCTS A LEAST SQUARES POLYNOMIAL OF A SPECIFIED DEGREE WHOSE GRAPH APPROXIMATES A SET OF DATA POINTS WITH WEIGHT ATTACHED TO EACH POINT AND IS CONSTRAINED TO PASS THROUGH SOME OF THE DATA POINTS.

F15FDLSQ CONSTRUCTS A LEAST SQUARES POLYNOMIAL APPROXIMATION OF SOME PREASSIGNED DEGREE TO A SET OF DATA POINTS WITH GIVEN WEIGHT WHERE THE POLYNOMIAL IS CONSTANT AT N POINTS AND THE DERIVATIVE IS ALSO CONSTRAINED AT M OF THE N POINTS.

F15FHRNEW CONSTRUCTS COEFFICIENTS OF THE N+1 DEGREE HERMITIAN INTERPOLATING POLYNOMIAL THROUGH N+1 POINTS WITH FIRST DERIVATIVES GIVEN AT THE FIRST M+1 POINTS (M NOT GREATER THAN N).

F15FITLIN CONSTRUCTS A BEST FITTING LINE TO A NUMBER OF DATA POINTS, IN THE SENSE THAT THE SUM OF THE SQUARES OF THE PERPENDICULAR DISTANCES FROM THE POINT TO THE LINE IS A MINIMUM.

F15FLGNEW CONSTRUCTS COEFFICIENTS OF THE N-TH DEGREE LAGRANGIAN INTERPOLATING POLYNOMIAL THROUGH N+1 POINTS.

F15FLSQFY FINDS BY THE METHOD OF LEAST SQUARES A POLYNOMIAL OF SPECIFIED DEGREE WHOSE GRAPH APPROXIMATES A SET OF DATA POINTS WITH WEIGHT ATTACHED TO EACH POINT, USING ORTHOGONAL POLYNOMIALS.

F15FOURAP CONSTRUCTS COEFFICIENTS OF THE BEST FOURIER SERIES WITH LINEAR TREND, IN THE LEAST SQUARES SENSE, TO A SET OF EQUISPACED DATA,

F15FOURI CONSTRUCTS COEFFICIENTS OF A FINITE FOURIER SERIES WITH A LINEAR TREND THROUGH A SET OF EQUISPACED POINTS.

F15GMI EVALUATES A M-TUPLE INTEGRAL (M LESS 11) OF AN INTEGRAND BETWEEN ARBITRARY LIMITS; THE INTEGRATION IS PERFORMED BY USING A 5-POINT GAUSS LEGENDRE FORMULA TO A NUMBER OF SUBINTERVALS SPECIFIED BY THE USER.

F15HERMIT EVALUATES AN EXPONENTIAL INTEGRAL BY HERMITE GAUSS QUADRATURE FORMULAS,

F15HRMT1 PERFORMS HERMITE INTERPOLATION AT ONE POINT GIVEN THE ABSCISSA AND A TABLE OF CORRESPONDING VALUES OF THE INDEPENDENT AND DEPENDENT VARIABLES AND ITS FIRST DERIVATIVE.

F15HRMT2 PERFORMS HERMITE INTERPOLATION FOR SEVERAL VALUES OF INDEPENDENT VARIABLE.

F15LAGDIF DIFFERENTIATES NUMERICALLY AN EQUALLY SPACED TABULAR FUNCTION AT ANY POINT USING AN INTERPOLATING POLYNOMIAL OF SPECIFIED ORDER,

F15LAGINT COMPUTES THE LAGRANGIAN POLYNOMIAL INTERPOLATED VALUE AT A GIVEN ABSCISSA, GIVEN N POINTS TO FIT EXACTLY BY A POLYNOMIAL OF DEGREE N-1.

F15LAGRAN EVALUATES THE INTEGRAL OF A REAL FUNCTION OF ONE VARIABLE BASED ON LAGRANGIAN INTERPOLATION.

F15LAGUER EVALUATES AN EXPONENTIAL INTEGRAL BY LAGUERRE GAUSS QUADRATURE FORMULAS,

F15LEGEND EVALUATES THE INTEGRAL OF ONE VARIABLE OVER A FINITE INTERVAL USING LEGENDRE GAUSS QUADRATURE FORMULAS.

F15MIGEN CONSTRUCTS A MINIMAX FUNCTION APPROXIMATION TO A SET OF GIVEN POINTS IN TERMS OF A LINEAR COMBINATION OF A PRESCRIBED SET OF AT MOST SEVEN FUNCTIONS.

F15MILN2 SMOOTHS A SET OF DATA; EACH SMOOTHED ORDINATE IS OBTAINED AS A WEIGHTED AVERAGE OF A SPECIFIED NUMBER OF OTHER POINTS IN ITS NEIGHBORHOOD.

F15MINRAT CONSTRUCTS A MINIMAX RATIONAL FUNCTION APPROXIMATION OF GIVEN DEGREE TO A DISCRETE DATA SET.

F15NRICH ENRICHES A SET OF POINTS BY ADDING POINTS ON AN INTERPOLATING CURVE THROUGH THE GIVEN POINTS; POINTS ARE GENERATED ON A CUBIC INTERPOLATING CURVE.

F15ORTHFT FITS, IN THE SENSE OF LEAST SQUARES, TO A GIVEN SET OF POINTS THE BEST LINEAR COMBINATION OF A SET OF PRESCRIBED GENERAL FUNCTIONS OF ONE OR MORE VARIABLES.

F15PADE CONSTRUCTS THE COEFFICIENTS OF THE PADE APPROXIMATION TO A FUNCTION OF WHICH THE MACLAURIN EXPANSION IS GIVEN.

F15PARBC EVALUATES THE INTEGRAL BY SIMPSONS RULE OF A BOUNDED FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL OF EQUISPACED VALUES.

F15PRONY CONSTRUCTS AN APPROXIMATION, WHICH IS THE SUM OF A PRESCRIBED NUMBER OF EXPONENTIALS, TO A SET OF N EQUALLY SPACED DATA POINTS.

F15QUAD EVALUATES THE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL, USING LEGENDRE GAUSS FORMULAS AND UNEQUAL SUBINTERVALS.

F15RATL CONSTRUCTS, IN THE SENSE OF LEAST SQUARES, THE BEST APPROXIMATION TO A SET OF DATA POINTS BY A RATIONAL FUNCTION WITH NUMERATOR AND DENOMINATOR OF A SPECIFIED DEGREE.

F15RICH ENRICHES A GIVEN CURVE DEFINED BY AN ARRAY OF POINTS SO AS TO SATISFY A SPECIFIED CHORD HEIGHT TOLERANCE USING AN INTERPOLATING FUNCTION WHICH ATTEMPTS TO MINIMIZE THE RIPPLE IN CURVATURE.

F15ROMBG EVALUATES THE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL USING ROMBERG INTEGRATION.

F15SIGSMT PERFORMS SMOOTHING OF A FOURIER SERIES BY USE OF LANZOS SIGMA FACTORS,

F15SIMP RC EVALUATES THE INTEGRAL OF A FUNCTION OVER A FINITE INTERVAL USING SIMPSONS RULE.

F15SINEVL EVALUATES A SINE POLYNOMIAL AT A GIVEN POINT.

F15SINSER CONSTRUCTS COEFFICIENTS OF A SINE POLYNOMIAL WITH A LINEAR TREND GIVEN A SET OF (ABSCISSA, ORDINATE) PAIRS WITH ARBITRARY SPACING.

F15SMOCUB PERFORMS SMOOTHING OF A TWO DIMENSIONAL DATA SET BY MOVING EACH OF THE INPUT DATA POINTS TOWARD A CUBIC THROUGH THE ADJACENT POINTS HAVING SLOPES AT THOSE POINTS DETERMINED BY THE CUBIC SPLINE THROUGH THE WHOLE DATA SET.

F15SMOOTH COMPUTES NP SMOOTHED FUNCTION VALUES GIVEN A SET OF NP ARGUMENT AND NP FUNCTION VALUES; THE SMOOTHING IS OBTAINED BY EVALUATING THE LEAST SQUARES POLYNOMIAL OF DEGREE N BASED ON SUCCESSIVE POINTS.

F15SPLINE CONSTRUCTS A FIFTH DEGREE SPLINE INTERPOLATING A SET OF EQUISPACED DATA,

F15SURFS FITS A SMOOTH SURFACE WITH CONTINUOUS FIRST PARTIAL DERIVATIVES TO A SET OF POINTS DEFINED OVER A RECTANGULAR GRID WITH ARBITRARY SPACING IN EACH DIRECTION.

F15TBLU1 LAGRANGIAN INTERPOLATION IN ONE DIMENSIONAL TABLE; ARBITRARY ORDER.

F15TBLU2 LAGRANGIAN INTERPOLATION IN TWO DIMENSIONAL TABLE; ARBITRARY ORDER.

F15TBLU3 LAGRANGIAN INTERPOLATION IN THREE DIMENSIONAL TABLE; ARBITRARY ORDER.

F15TRGDI F CONSTRUCTS COEFFICIENTS OF THE DERIVATIVE OF A FOURIER SERIES, GIVEN THE COEFFICIENTS OF THE TRIGONOMETRIC POLYNOMIAL,
 F15TRGINT CONSTRUCTS COEFFICIENTS OF THE FOURIER SERIES WITH A LINEAR TREND THAT IS OBTAINED BY INTEGRATION OF A TRIGONOMETRIC POLYNOMIAL,
 F15UNCSP CONSTRUCTS A NONLINEAR CUBIC SPLINE INTERPOLATING A SET OF POINTS WITH ARBITRARY SPACING,
 F16BALANC BALANCES A COMPLEX MATRIX BY MEANS OF DIAGONAL SIMILARITY TRANSFORMATIONS,
 F16BANEIG COMPUTES THE SMALLEST EIGENVALUES AND ASSOCIATED EIGENVECTORS OF A SYMMETRIC, NONNEGATIVE DEFINITE, NARROW BANDMATRIX USING THE METHO
 D OF INVERSE WIELANDT ITERATION WITH PERIODIC RAYLEIGH QUOTIENT SHIFTING COMBINED WITH A STABLE, BAND-PRESERVING DEFLATION TECHNIQUE,

F16BCHSDC DECOMPOSES BY THE CHOLESKY METHOD A REAL, SYMMETRIC POSITIVE DEFINITE BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS.
 F16BDCWNP DECOMPOSES BY GAUSSIAN ELIMINATION WITHOUT PIVOTING A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULAR FACTORS; THE DETERMINANT IS ALS
 O AVAILABLE.
 F16BDECOM DECOMPOSES BY GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION A REAL BANDMATRIX INTO UPPER AND LOWER TRIANGULAR
 FACTORS.
 F16BFBANP SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITHOUT PIVOTING HAS BEEN
 CARRIED OUT, POSSIBLY BY SUBROUTINE BDCWNP.
 F16BFBSUM SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING AND
 IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BDECOM.
 F16BITERM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION
 WITH PARTIAL PIVOTING AND IMPLICIT EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBE
 R.
 F16BITRFM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTI
 AL PIVOTING AND IMPLICIT EQUILIBRATION AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBER.
 F16BITRNP SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION
 WITHOUT PIVOTING HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBER.
 F16BITRPD SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED
 TRIANGULAR DECOMPOSITION BY CHOLESKYS METHOD HAS BEEN CARRIED OUT.
 F16BITWNP SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PI
 VOTING AND GIVES AN ESTIMATE FOR THE ACCURACY AND THE CONDITION NUMBER.
 F16BLESOM SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING AND IMPLICIT E
 QUILIBRATION; THE DETERMINANT IS ALSO AVAILABLE.
 F16BLSWNP SOLVES A LINEAR SYSTEM FOR A BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING GAUSSIAN ELIMINATION WITHOUT PIVOTING; THE DETERMINANT IS
 ALSO AVAILABLE.
 F16BPDFSB SOLVES A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION B
 Y CHOLESKYS METHOD HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE BCHSDC.
 F16BPDITM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING CHO
 LESKYS METHOD FOR THE TRIANGULAR DECOMPOSITION.
 F16BPDSOM SOLVES A LINEAR SYSTEM FOR A SYMMETRIC POSITIVE DEFINITE BANDMATRIX WITH SEVERAL RIGHT-HAND SIDES USING CHOLESKYS METHOD FOR THE TRIA
 NGULAR DECOMPOSITION.
 F16BSUBHT SOLVES A LEAST SQUARES PROBLEM PROVIDED DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT.
 F16CCONGR SOLVES A LEAST SQUARES PROBLEM FOR A COMPLEX SYSTEM USING THE METHOD OF CONJUGATE GRADIENT.
 F16CDECOM DECOMPOSES A COMPLEX MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; ALSO COMPUTES
 ITS DETERMINANT.
 F16CFBSUM SOLVES A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPOSITION FOLLOWING CROUTS ALGO
 RITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE CDECOM.
 F16CGITRF SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED THE TRIANGULAR DECOMPO
 SITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT; THE DETERMINANT AND CONDITIO
 N NUMBER ARE AVAILABLE.
 F16CGLESM SOLVES A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUIL
 IBRATION.
 F16CHSDEC DECOMPOSES A SYMMETRIC POSITIVE DEFINITE MATRIX INTO TRIANGULAR FACTORS USING CHOLESKYS METHOD; THE DETERMINANT IS AVAILABLE.
 F16CINPRD COMPUTES THE DOUBLE PRECISION INNER PRODUCT OF TWO VECTORS HAVING COMPLEX ELEMENTS.
 F16CITERF SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM FOR A COMPLEX MATRIX WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION
 ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT AND GIVES AN ESTIMATE FOR THE ACCURAC
 Y AND THE CONDITION NUMBER.
 F16DCBHT TRANSFORMS A MATRIX INTO UPPER TRIANGULAR FORM BY HOUSEHOLDERS METHOD.
 F16DCWNE DECOMPOSES A MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT I
 S AVAILABLE.
 F16DCWNP DECOMPOSES A MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE.
 F16DECOM DECOMPOSES A MATRIX INTO TRIANGULAR FACTORS USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION; THE DETERMINANT IS AV
 AILABLE.
 F16DEIG SOLVES THE EIGENSYSTEM FOR THE SECOND ORDER DIFFERENTIAL EQUATION A^*X .

F16DETERM CALCULATES MANTISSA AND EXPONENT (BASE 2) OF THE DETERMINANT OF A MATRIX PROVIDED TRIANGULAR DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT BY SUBROUTINE DECOM.
 F16DTSHTF CALCULATES A GUESS OF AN EIGENVALUE TO A COMPLEX HESSENBERG MATRIX USING HYMAN'S METHOD TO EVALUATE THE DETERMINANT.
 F16EIG5 CALCULATES SOME EIGENVALUES OF A REAL MATRIX BY MEANS OF A MODIFICATION OF LAGUERRES METHOD.
 F16EIGCHK IMPROVES AN APPROXIMATE EIGENVALUE EIGENVECTOR PAIR OF A REAL SYMMETRIC MATRIX BY CALCULATING THE RAYLEIGH QUOTIENT AND GIVES ERROR BOUNDS.
 F16EIGCO1 CALCULATES THE EIGENVALUE EIGENVECTOR PAIR WHICH IS NEAREST TO AN APPROXIMATION OF AN EIGENVALUE OF A REAL MATRIX HAVING DISTINCT REAL EIGENVALUES.
 F16EIGIMP REFINES AN EIGENVECTOR BELONGING TO A SINGLE REAL EIGENVALUE OF A REAL HESSENBERG MATRIX BY MEANS OF WIELANDT INVERSE ITERATION.
 F16EIGSYM CALCULATES ALL EIGENVALUES AND SOME EIGENVECTORS OF A REAL SYMMETRIC MATRIX.
 F16EIGVCH CALCULATES AN EIGENVECTOR BELONGING TO A SINGLE REAL EIGENVALUE OF A REAL HESSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
 F16FBSSUBM SOLVES A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT, POSSIBLY BY SUBROUTINE DECOM.
 F16FBSSUBS SOLVES A LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT.
 F16FCGM2 SOLVES A RECTANGULAR LINEAR REAL SYSTEM IN THE SENSE OF LEAST SQUARES ACCORDING TO THE CONJUGATE GRADIENT METHOD.
 F16GITRFM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
 F16GITRFS SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
 F16GLESOM SOLVES A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
 F16GLESOS SOLVES A LINEAR SYSTEM ACCORDING TO CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
 F16HSSN TRANSFORMS A REAL MATRIX TO UPPER HESSENBERG FORM USING WILKINSON'S METHOD.
 F16INVERS INVERTS A MATRIX USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
 F16INVITR INVERTS WITH ITERATIVE REFINEMENT A MATRIX USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION.
 F16ITERFM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX.
 F16ITERFS SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING ACCORDING TO CROUTS ALGORITHM HAS BEEN CARRIED OUT AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND CONDITION NUMBER OF THE MATRIX.
 F16ITERIN REFINES ITERATIVELY THE INVERSE OF A MATRIX PROVIDED TRIANGULAR DECOMPOSITION USING CROUTS ALGORITHM WITH PARTIAL PIVOTING AND ROW EQUILIBRATION HAS BEEN CARRIED OUT.
 F16ITRLSQ REFINES ITERATIVELY A SOLUTION OF A LEAST SQUARES PROBLEM PROVIDED DECOMPOSITION WITH HOUSEHOLDERS METHOD HAS BEEN CARRIED OUT.
 F16ITRPDM SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM PROVIDED DECOMPOSITION WITH CHOLESKY'S METHOD HAS BEEN CARRIED OUT AND PROVIDES DATA FOR ESTIMATING THE CONDITION NUMBER AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
 F16ITRPDS SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED DECOMPOSITION WITH CHOLESKY'S METHOD HAS BEEN CARRIED OUT AND PROVIDES DATA FOR ESTIMATING THE CONDITION NUMBER AND THE NUMBER OF CORRECT DIGITS IN THE FIRST COMPUTED SOLUTION.
 F16ITRSPM SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT.
 F16ITRSPS SOLVES WITH ITERATIVE REFINEMENT A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM WITH SEVERAL RIGHT-HAND SIDES PROVIDED SQUARE ROOT FREE DECOMPOSITION HAS BEEN CARRIED OUT.
 F16LATNTR CALCULATES THE EIGENVALUES (COMPLEX AND REAL) OF A REAL MATRIX USING HOUSEHOLDERS TRANSFORMATION FOLLOWED BY DOUBLE QR ITERATION.
 F16LESWNE SOLVES A LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION; THE DETERMINANT IS AVAILABLE.
 F16LESWNP SOLVES A LINEAR SYSTEM USING CROUTS ALGORITHM WITHOUT PIVOTING; THE DETERMINANT IS AVAILABLE.
 F16LITWNE SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CROUTS ALGORITHM WITH PARTIAL PIVOTING WITHOUT ROW EQUILIBRATION AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER.
 F16LITWNP SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CROUTS ALGORITHM WITHOUT PIVOTING AND PROVIDES DATA FOR ESTIMATING THE DETERMINANT AND CONDITION NUMBER.
 F16LSQHTM SOLVES A LINEAR LEAST SQUARES PROBLEM WITH SEVERAL RIGHT-HAND SIDES USING HOUSEHOLDER TRANSFORMATIONS.
 F16LSQHTS SOLVES A LINEAR LEAST SQUARES PROBLEM USING HOUSEHOLDER TRANSFORMATIONS.
 F16LSQSIT SOLVES WITH ITERATIVE REFINEMENT A LINEAR LEAST SQUARES PROBLEM USING HOUSEHOLDERS METHOD.
 F16PDITRM SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY'S DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND ESTIMATING THE CONDITION NUMBER OF THE MATRIX.
 F16PDITRS SOLVES WITH ITERATIVE REFINEMENT A LINEAR SYSTEM USING CHOLESKY DECOMPOSITION AND PROVIDES DATA FOR CALCULATING THE DETERMINANT AND ESTIMATING THE CONDITION NUMBER OF THE MATRIX.
 F16PDL5OM SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING CHOLESKY DECOMPOSITION.
 F16PDL5OS SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM USING CHOLESKY DECOMPOSITION.
 F16PDSFBM SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED TRIANGULAR DECOMPOSITION USING CHOLESKY D

ECOMPOSITION HAS BEEN CARRIED OUT.
F16PDSFB8 SOLVES A SYMMETRIC POSITIVE DEFINITE LINEAR SYSTEM PROVIDED TRIANGULAR DECOMPOSITION USING CHOLSKY DECOMPOSITION HAS BEEN CARRIED OUT.

F16QR1 PERFORMS A SINGLE COMPLEX QR ITERATION ON A HESSENBERG MATRIX HAVING REAL SUBDIAGONAL ELEMENTS,
F16QREIGN CALCULATES ALL EIGENVALUES AND EIGENVECTORS OF A COMPLEX MATRIX BY MEANS OF QR ITERATION ON A SIMILAR BALANCED HESSENBERG MATRIX,
F16RAYLGH CALCULATES THE RAYLEIGH QUOTIENT FOR A REAL SYMMETRIC MATRIX,
F16RECOV1 RECOVER EIGENVECTORS AFTER A REDUCTION USING A TRIANGULAR MATRIX IN THE SIMILARITY TRANSFORMATION USED FOR SOLVING THE GENERAL EIGENVALUE PROBLEM.
F16RECOV2 RECOVER EIGENVECTORS AFTER A REDUCTION USING A TRIANGULAR MATRIX IN THE SIMILARITY TRANSFORMATION USED FOR SOLVING THE GENERAL EIGENVALUE PROBLEM.

F16REDSY1 REDUCE THE GENERAL EIGENVALUE PROBLEM TO A STANDARD EIGENVALUE PROBLEM,
F16REDSY2 REDUCE THE GENERAL EIGENVALUE PROBLEM TO A STANDARD EIGENVALUE PROBLEM,
F16SCONG SOLVES A LINEAR SYSTEM FOR A LARGE SPARSE RECTANGULAR MATRIX USING THE CONJUGATE GRADIENT METHOD,
F16SEPAR2 CALCULATES A SUBSET OF EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX USING THE STURM SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS.

F16SEPAR CALCULATES ALL EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX USING THE STURM SEQUENCE PROPERTY OF THE DETERMINANTS OF THE LEADING MINORS.
F16SIMP PERFORMS THE DESIRED BACK SUBSTITUTION ON THE EIGENVECTORS OF A HESSENBERG MATRIX PROVIDED THE TRANSFORMATION TO HESSENBERG FORM HAS BEEN CARRIED OUT WITH WILKENSONS METHOD.
F16SPDCOM DECOMPOSES A SYMMETRIC POSITIVE DEFINITE MATRIX INTO LOWER TRIANGULAR, DIAGONAL AND UPPER TRIANGULAR FACTORS WITHOUT CALCULATING A SQUARE ROOT; THE DETERMINANT IS AVAILABLE.
F16SPDFBM SOLVES A POSITIVE DEFINITE LINEAR SYSTEM PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE,
F16SPDFBS SOLVES A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES PROVIDED THE MATRIX HAS BEEN DECOMPOSED WITHOUT USING THE SQUARE ROOT ROUTINE.
F16SPDSOM SOLVES A POSITIVE DEFINITE LINEAR SYSTEM WITHOUT USING THE SQUARE ROOT ROUTINE,
F16SPDSOS SOLVES A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES WITHOUT USING THE SQUARE ROOT ROUTINE.
F16SPITRM SOLVES WITH ITERATIVE REFINEMENT A POSITIVE DEFINITE LINEAR SYSTEM USING SQUARE ROOT FREE DECOMPOSITION,
F16SPITRS SOLVES WITH ITERATIVE REFINEMENT A POSITIVE DEFINITE LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES USING SQUARE ROOT FREE DECOMPOSITION.

F16SUBDIA REDUCES A COMPLEX MATRIX TO HESSENBERG FORM USING A MODIFICATION OF HOUSEHOLDERS METHOD.
F16SUBDIR TRANSFORMS A REAL MATRIX INTO UPPER HESSENBERG FORM ACCORDING TO HOUSEHOLDERS METHOD,
F16SYMLR CALCULATES ALL EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX USING LR ITERATION.
F16SYMQR CALCULATES ALL EIGENVALUES OF A SYMMETRIC TRIDIAGONAL MATRIX USING QR ITERATION.
F16TCDIAG CALCULATES A NUMBER OF EIGENVALUES AND EIGENVECTORS OF A HERMITIAN MATRIX USING HOUSEHOLDERS TRANSFORMATION TO TRIDIAGONAL FORM FOLLOWED BY EITHER QR ITERATION OR LR ITERATION OR THE STURM SEQUENCE METHOD; EIGENVECTORS ARE FOUND BY MEANS OF INVERSE ITERATION,
F16TRDCNP DECOMPOSES A TRIDIAGONAL MATRIX INTO TRIANGULAR FACTORS WITHOUT PIVOTING,
F16TRDCOM DECOMPOSES A TRIDIAGONAL MATRIX INTO LOWER AND UPPER TRIANGULAR FACTORS USING PARTIAL PIVOTING.
F16TRDFBM SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITH PARTIAL PIVOTING HAS BEEN CARRIED OUT,
F16TRDSOM SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX USING PARTIAL PIVOTING,
F16TRDSUB SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX PROVIDED DECOMPOSITION WITHOUT PIVOTING HAS BEEN CARRIED OUT.
F16TRDWNP SOLVES A LINEAR SYSTEM FOR A TRIDIAGONAL MATRIX WITHOUT PIVOTING,
F16TRIDI TRANSFORMS A SYMMETRIC MATRIX INTO TRIDIAGONAL FORM USING HOUSEHOLDERS TRANSFORMATION,
F16TRILOM SOLVES A LOWER TRIANGULAR LINEAR SYSTEM,
F16TRILOS SOLVES A LOWER TRIANGULAR LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES,
F16TRIUPM SOLVES AN UPPER TRIANGULAR LINEAR SYSTEM,
F16TRIUPS SOLVES AN UPPER TRIANGULAR LINEAR SYSTEM HAVING SEVERAL RIGHT-HAND SIDES,
F16TRLOIN INVERTS A LOWER TRIANGULAR MATRIX,
F16TRUPIN INVERTS AN UPPER TRIANGULAR MATRIX,
F16VALVEC CALCULATES THE EIGENVALUES AND A NUMBER OF EIGENVECTORS OF A COMPLEX MATRIX USING QR ITERATION ON A SIMILAR HESSENBERG MATRIX FOR THE EIGENVALUES AND INVERSE ITERATION FOR THE EIGENVECTORS.

F16VECORD ORDERS A SET OF COMPLEX NUMBERS ACCORDING TO EITHER DECREASING OR INCREASING MAGNITUDE IN A WAY WHICH IS NOT EFFICIENT FOR A LARGE SET OF NUMBERS.
F16VECTOR CALCULATES AN EIGENVECTOR BELONGING TO A GOOD APPROXIMATION OF AN EIGENVALUE USING INVERSE ITERATION,
F17BETAR COMPUTES THE INCOMPLETE BETA RATIO.
F17BRTLTT PERFORMS BARTLETTS TEST OF THE HOMOGENEITY OF A GROUP OF VARIANCE ESTIMATES,
F17CHIDST PERFORMS CHI SQUARE TEST FOR GOODNESS OF FIT,
F17CHIPRB COMPUTES CHI SQUARE CUMULATIVE DISTRIBUTION FUNCTION,
F17CHIRAB PERFORMS CHI SQUARE TEST FOR SYMMETRY ABOUT ZERO,
F17CHIRUD PERFORMS CHI SQUARE TEST FOR RUNS UP AND DOWN,
F17CHSQO COMPUTES CHI SQUARE TEST-STATISTIC FOR GIVEN EXPECTED AND OBSERVED FREQUENCIES.

F17CONRAY PERFORMS ARITHMETIC OPERATIONS ON THE VALUES OF ONE VARIABLE IN A MULTIPLEXED ARRAY AND A GIVEN CONSTANT.
 F17CORCOV COMPUTES EITHER AUTO CORRELATION COEFFICIENTS OR THE AUTO VARIANCE COEFFICIENTS FOR ONE VARIABLE IN A MULTIPLEXED ARRAY.
 F17DELETE REMOVES SPECIFIED OBSERVATIONS FROM A DATA ARRAY.
 F17DSCR2 COMPUTES MEDIAN, MINIMUM, MAXIMUM, AND RANGE FOR ONE OR ALL VARIABLES IN A MULTIPLEXED ARRAY.
 F17DSCRPT COMPUTES MEANS, STANDARD DEVIATIONS, VARIANCES, AND COEFFICIENTS OF SKEWNESS AND KURTOSIS FOR MULTIPLEXED ARRAYS.
 F17EXRAND GENERATES RANDOM NUMBERS HAVING A NEGATIVE EXPONENTIAL DISTRIBUTION.
 F17FILTER COMPUTES THE OUTPUTS OF A MOVING AVERAGE AUTO REGRESSIVE FILTER.
 F17GAMAIN COMPUTES THE INCOMPLETE GAMMA FUNCTION.
 F17HARM COMPUTES THE FAST FOURIER TRANSFORM OF AN ARRAY OF COMPLEX FOURIER AMPLITUDES.
 F17HSTGRM COMPUTES THE NUMBER OF OBSERVATIONS IN SPECIFIED INTERVALS; USED TO PRODUCE HISTOGRAMS.
 F17IRAND GENERATES UNIFORM RANDOM INTEGERS BETWEEN TWO GIVEN VALUES.
 F17NRAND GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION AND STORES THE VALUES IN A MULTIPLEXED ARRAY.
 F17NRML GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION.
 F17NRMNO GENERATES RANDOM NUMBERS HAVING A NORMAL DISTRIBUTION, PROVIDING A CONVENIENT WAY OF HANDLING THE TAIL AND STORES THE VALUES IN A MULTIPLEXED ARRAY.
 F17OP1RAY PERFORMS TRANSFORMATIONS ON THE OBSERVATIONS OF ONE VARIABLE IN A MULTIPLEXED ARRAY.
 F17OP2RAY PERFORMS ARITHMETIC TRANSFORMATIONS ON THE OBSERVATIONS OF TWO VARIABLES IN MULTIPLEXED ARRAYS.
 F17PBETA COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE BETA DISTRIBUTION.
 F17PBINOM COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE BINOMIAL DISTRIBUTION.
 F17PCHY COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE CAUCHY DISTRIBUTION.
 F17PFDIST COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE F (VARIANCE RATIO) DISTRIBUTION.
 F17PGEOM COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE GEOMETRIC DISTRIBUTION.
 F17PGMMA COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE GAMMA DISTRIBUTION.
 F17PHYGGE COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE HYPER GEOMETRIC DISTRIBUTION.
 F17PIBETA COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE BETA DISTRIBUTION.
 F17PIBIN COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE BINOMIAL DISTRIBUTION.
 F17PICHY COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE CHI SQUARE DISTRIBUTION.
 F17PICHY COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE CAUCHY DISTRIBUTION.
 F17PIEXP COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE EXPONENTIAL DISTRIBUTION.
 F17PIFDIS COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE F (VARIANCE RATIO) DISTRIBUTION.
 F17PIGAMA COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE GAMMA DISTRIBUTION.
 F17PIGEO COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE GEOMETRIC DISTRIBUTION.
 F17PIHYPG COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE HYPER GEOMETRIC DISTRIBUTION.
 F17PILGNM COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE LOG NORMAL DISTRIBUTION.
 F17PINBIN COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE NEGATIVE BINOMIAL DISTRIBUTION.
 F17PINORM COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE NORMAL DISTRIBUTION.
 F17PIPOIS COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE POISSON DISTRIBUTION.
 F17PIRAYL COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE RAYLEIGH DISTRIBUTION.
 F17PITRNM COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE TRUNCATED NORMAL DISTRIBUTION.
 F17PIT COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE STUDENTS T DISTRIBUTION.
 F17PIUNFD COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE DISCRETE UNIFORM DISTRIBUTION.
 F17PIUNF COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE UNIFORM DISTRIBUTION.
 F17PIWEBL COMPUTES THE INVERSE CUMULATIVE DISTRIBUTION FUNCTION OF THE WEIBULL DISTRIBUTION.
 F17PLGNRM COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE LOG NORMAL DISTRIBUTION.
 F17PNBIN COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE NEGATIVE BINOMIAL DISTRIBUTION.
 F17PNORM COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE NORMAL DISTRIBUTION.
 F17POIS COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE POISSON DISTRIBUTION.
 F17PORAND GENERATES RANDOM INTEGERS HAVING THE POISSON DISTRIBUTION.
 F17PRAYL COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE RAYLEIGH DISTRIBUTION.
 F17PRBEXP COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE EXPONENTIAL DISTRIBUTION.
 F17PRBUNF COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE UNIFORM DISTRIBUTION.
 F17PTDIST COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE STUDENTS T DISTRIBUTION.
 F17PTRNRM COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE TRUNCATED NORMAL DISTRIBUTION.
 F17PUNFD COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE DISCRETE UNIFORM DISTRIBUTION.
 F17PWEBL COMPUTES THE CUMULATIVE DISTRIBUTION FUNCTION OF THE WEIBULL DISTRIBUTION.
 F17RAND GENERATES RANDOM NUMBERS HAVING UNIFORM OR NORMAL DISTRIBUTION.
 F17RUNSAB COMPUTES THE NUMBER OF RUNS (EXPECTED IN SYMMETRIC DISTRIBUTION AND OBSERVED) ABOVE AND BELOW ZERO OF DIFFERENT LENGTHS FOR A SAMPLE.
 F17RUNSUD COMPUTES THE NUMBER OF RUNS (EXPECTED AND OBSERVED) UP AND DOWN FOR A SAMPLE.
 F17SUMPS COMPUTES THE DOUBLE PRECISION SUMS OF POWERS OF OBSERVATIONS.

F17URAND GENERATES RANDOM NUMBERS HAVING A UNIFORM DISTRIBUTION AND STORES THE VALUES AS ONE VARIABLE IN A MULTIPLEXED ARRAY.
 F17VARORD SORTS THE VALUES OF ONE VARIABLE IN A MULTIPLEXED ARRAY IN INCREASING ORDER.
 F17XIRAND GENERATES UNIFORM RANDOM FLOATING POINT NUMBERS BETWEEN TWO GIVEN VALUES.
 F17XYPLOT PROVIDES A PRINTER PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) AGAINST A SINGLE VARIABLE (ABSCISSA).
 F17YPLOT PROVIDES A PRINTER PLOT OF THE VALUES FOR UP TO 5 VARIABLES (ORDINATES) IN THEIR STORED ORDER (ABSCISSA).
 F17ZRNM COMPUTES THE VECTOR OF MEANS AND SUBTRACTS THE MEAN FROM EACH OBSERVATION OF A SET.
 F18CNSLVL ESTIMATES THE ROUNDING ERROR IN THE EVALUATION OF A COMPLEX POLYNOMIAL NEAR ONE OF ITS ROOTS THROUGH FORWARD ERROR ANALYSIS.
 F18CPOLRT FINDS ALL THE ZEROS OF A COMPLEX POLYNOMIAL BY APPLYING STEEPEST DESCENT WITH ACCELERATION DEVICES AND USING EXPLICIT DEFLATION WHEN ONE ZERO IS ACCEPTED.
 F18HELP FINDS ALL THE ZEROS OF A COMPLEX POLYNOMIAL BY LEHMERS METHOD USING SCHURS METHOD FOR ISOLATING ONE ZERO.
 F18LINSYS SOLVES A SYSTEM OF LINEAR EQUATIONS OR SEVERAL SYSTEMS WITH THE SAME LEFT HAND SIDE BY GAUSSIAN ELIMINATION USING DOOLITTLES METHOD AND APPLYING PARTIAL PIVOTING AND DOUBLE PRECISION ARITHMETIC FOR THE CALCULATION OF INNER PRODUCTS.
 F18MULLP FINDS ALL THE ZEROS OR A SINGLE ZERO OF A COMPLEX POLYNOMIAL BY MULLERS METHOD WITH DEFLATION.
 F18NEWT SOLVES A SYSTEM OF NONLINEAR EQUATIONS BY COMPUTING IN EACH ITERATION A CORRECTION VECTOR TO THE TRIAL SOLUTION VECTOR WITH THE NEWTON RAPHSON METHOD MODIFYING THIS CORRECTION VECTOR WHEN IT IS TOO LARGE OR WHEN THE CORRECTION DOES NOT IMPROVE THE RESIDUAL OF THE EQUATIONS.
 F18NONLIQ SOLVES A SYSTEM OF NONLINEAR ALGEBRAIC EQUATIONS USING THE GENERALIZED SECANT METHOD MODIFYING THE STEP VECTOR WHEN THE SET OF GUESSES TEND TO BECOME LINEARLY DEPENDENT OR WHEN THE RESIDUALS DO NOT DECREASE.
 F18NRSQ SOLVES AN OVER DETERMINED SYSTEM OF NONLINEAR EQUATIONS BY CALCULATING A STEP VECTOR DIRECTION AS A LEAST SQUARES SOLUTION OF THE SYSTEM OF LINEAR EQUATIONS IN THE NEWTON RAPHSON METHOD AND SWITCHING TO THE STEEPEST DESCENT METHOD IF THE FORMER METHOD GIVES DIVERGENCE; IN THE STEP VECTOR DIRECTION THE OPTIMAL STEP VECTOR IS CALCULATED BY PARABOLIC INTERPOLATION.
 F18NSLVL ESTIMATES THE ROUNDING ERROR IN THE EVALUATION OF A POLYNOMIAL WITH REAL COEFFICIENTS NEAR ONE OF ITS COMPLEX ROOTS THROUGH FORWARD ERROR ANALYSIS.
 F18PROOT FINDS ALL ZEROS OF A POLYNOMIAL WITH REAL COEFFICIENTS WITH NEWTONS METHOD OR BAIRSTOWS METHOD BY PERFORMING SIMULTANEOUSLY ONE ITERATION OF EACH METHOD AND DEFLATING THE ORIGINAL POLYNOMIAL WHEN A LINEAR OR QUADRATIC FACTOR IS FOUND.
 F18QNWT SOLVES A SYSTEM OF NONLINEAR EQUATIONS BY USING THE NEWTON RAPHSON METHOD IN THE FIRST ITERATION AND BY UPDATING THE APPROXIMATION OF THE JACOBIAN IN THE NEXT ITERATIONS (QUASI NEWTON METHOD).
 F18RQNWTFINDS A SYSTEM OF NONLINEAR EQUATIONS BY CALLING SUBROUTINE QNWT A NUMBER OF TIMES WITH DIFFERENT INITIAL GUESSES.
 F18ZAFUJ FINDS A REQUIRED NUMBER OF ZEROS OF A COMPLEX FUNCTION USING A METHOD DESCRIBED BY JARRATT AND NUDDS FOR APPROXIMATION OF ONE ZERO AND FACTORING OUT PREVIOUSLY FOUND ZEROS.
 F18ZAFUM FINDS A REQUIRED NUMBER OF ZEROS OF A COMPLEX FUNCTION WITH MULLERS METHOD AND FACTORING OUT PREVIOUSLY FOUND ZEROS.
 F18ZAFUR FINDS A REQUIRED NUMBER OF REAL ZEROS OF A REAL FUNCTION WITH A METHOD DESCRIBED BY JARRATT AND NUDDS FOR APPROXIMATION OF ONE ZERO AND FACTORING OUT PREVIOUSLY FOUND ZEROS.
 F18ZCOUNT CALCULATES THE NUMBER OF ZEROS, DECREASED BY THE NUMBER OF POLES, OF A COMPLEX FUNCTION IN AN AREA IN THE COMPLEX PLANE ENCLOSED BY A POLYGON.