
**stichting
mathematisch
centrum**



DEPARTMENT OF NUMERICAL MATHEMATICS

NW 8/76 FEBRUARY

P.W. HEMKER (ed.)

NUMAL, A LIBRARY OF NUMERICAL PROCEDURES IN ALGOL 60
INDEX AND KWIC INDEX

3rd edition

2e boerhaavestraat 49 amsterdam

BIBLIOTHEEK MATHEMATISCH CENTRUM
AMSTERDAM

5761. B41

Printed at the Mathematical Centre, 49, 2e Boerhaavestraat, Amsterdam.

The Mathematical Centre, founded the 11-th of February 1946, is a non-profit institution aiming at the promotion of pure mathematics and its applications. It is sponsored by the Netherlands Government through the Netherlands Organization for the Advancement of Pure Research (Z.W.O), by the Municipality of Amsterdam, by the University of Amsterdam, by the Free University at Amsterdam, and by industries.

AMS(MOS) subject classification scheme (1970): 65-00

first printing december 1973

second edition April 1974

third edition February 1976

THE LIBRARY
NUMAL
OF ALGOL 60 PROCEDURES IN NUMERICAL MATHEMATICS

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INTRODUCTION.

AT THE REQUEST OF THE ACADEMIC COMPUTING CENTRE OF AMSTERDAM (SARA) THE MATHEMATICAL CENTRE HAS ADAPTED AND EXTENDED ITS LIBRARY OF NUMERICAL PROCEDURES FOR USE WITH THE CD CYBER 70 SYSTEM. THE RESULTING LIBRARY IS CALLED "NUMAL" ("NUM"ERICAL PROCEDURES IN "AL" GOL 60).

THE AIM OF NUMAL IS TO PROVIDE A HIGH LEVEL NUMERICAL LIBRARY FOR ALGOL 60 PROGRAMMERS. THE LIBRARY CONTAINS A SET OF VALIDATED NUMERICAL PROCEDURES TOGETHER WITH SUPPORTING DOCUMENTATION. EXCEPT FOR A SMALL NUMBER OF DOUBLE PRECISION ARITHMETIC ROUTINES ALL THE SOURCE TEXTS ARE WRITTEN IN ALGOL 60 AND THEY ARE TO A HIGH DEGREE INDEPENDENT OF THE COMPUTER/COMPILER USED.

THE LIBRARY IS UNDER CONTINUOUS DEVELOPMENT AND ,HENCE, ANY DESCRIPTION WILL BE AN INSTANTANEOUS ONE. THE MATHEMATICAL CENTRE WILL DISTRIBUTE UPDATINGS AND EXTENSIONS OF THE MANUAL ONCE A YEAR.

ORGANIZATION.

EACH PROCEDURE OF THE LIBRARY IS IDENTIFIED BY A NAME AND A CODE NUMBER. THE CODE NUMBER HAS TO BE USED WHEN, IN AN ALGOL 60 PROGRAM, REFERENCE IS MADE TO THE PRE-COMPILED PROCEDURE IN THE OBJECT CODE LIBRARY.

ALL PROCEDURES IN NUMAL ARE CLASSIFIED ACCORDING TO SUBJECT. THE SUBJECTS ARE IDENTIFIED BY A SECTION NUMBER. THE MANUAL IS ORDERED BY THESE SECTION NUMBERS.

IN ORDER TO FIND A PARTICULAR PROCEDURE, THERE IS A SYSTEMATICAL INDEX IN WHICH ALL PROCEDURES (THEIR NAMES AND THEIR CODE NUMBERS) ARE MENTIONED, CLASSIFIED BY THEIR SECTION NUMBER (I.E. BY SUBJECT).

FOR CROSS REFERENCING THERE IS AN INDEX BY CODE NUMBER, WHICH HAS REFERENCES TO PROCEDURE NAME AND SECTION NUMBER, AND THERE IS ALSO A KWIC INDEX IN WHICH KEYWORDS AND PROCEDURE NAMES HAVE BEEN ORDERED ALPHABETICALLY.

ORIGIN OF THE PROGRAMS.

THE MAJOR PART OF THE LIBRARY CONSISTS OF PROCEDURES THAT HAVE BEEN DEVELOPED AT THE MATHEMATICAL CENTRE. HOWEVER, SOME PROCEDURES ARE ADAPTED VERSIONS OF PROCEDURES PUBLISHED IN THE LITERATURE. IN PARTICULAR A NUMBER OF PROGRAMS ARE DERIVED FROM PROCEDURES PUBLISHED BY G.H. GOLUB AND C. REINSCH.

EDITORIAL BOARD.

NEW CONTRIBUTIONS CAN BE INSERTED IF THEY SATISFY THE STANDARDS AND IF THEY FIT INTO THE FRAMEWORK OF NUMAL. CONTRIBUTIONS CAN BE SUBMITTED TO ONE OF THE MEMBERS OF THE EDITORIAL BOARD:

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ACKNOWLEDGEMENTS.

THE LIBRARY NUMAL IS BEING DEVELOPED BY THE JOINT EFFORTS OF THE MEMBERS OF THE LIBRARY GROUP OF THE NUMERICAL MATHEMATICS DEPARTMENT OF THE MATHEMATICAL CENTRE. IN PARTICULAR, HOWEVER, WE WANT TO ACKNOWLEDGE THE MEMBERS F. GROEN, R. PISCAER AND G.J.F. VINKESTEYN, WHO TOOK CARE OF FILE MANIPULATION, EDITING OF THE DOCUMENTATION FILES AND ADAPTION AND RUNNING OF THE KWIC INDEX PROGRAM.

P.W. HEMKER
MANAGING EDITOR

P.J. VAN DER HOUWEN
HEAD OF THE DEPT. OF NUMERICAL MATHEMATICS

CLASSIFIED ACCORDING TO SUBJECT, THIS INDEX CONTAINS THE NAMES OF THE PROCEDURES AND THE CORRESPONDING CODE NUMBERS. THE DOCUMENTATION OF THE PROCEDURES IS PRESENTED IN VOLUMES 1 THROUGH 7 AND IS ARRANGED ACCORDING TO SECTION NUMBERS, HENCE REFERENCE IS IMMEDIATE.

IN ADDITION TO THE CODENUMBER AND THE NAME OF EACH PROCEDURE THE MONTH OF FIRST APPEARANCE OF THE FINAL DOCUMENTATION IS LISTED. A SEPARATE REVISION RECORD ENABLES THE USER TO CHECK WHETHER HIS MANUAL IS ACCURATELY UPDATED.

TO LOCATE A PIECE OF DOCUMENTATION IN MACHINE-READABLE FORM (E.G. FOR USE WITH THE CD CYBER 70 SYSTEM) THE SYSTEMATICAL INDEX ALSO GIVES THE RECORD NUMBER (LEVEL 0) WHERE EACH PIECE OF DOCUMENTATION CAN BE FOUND ON THE DOCUMENTATION FILE (I.C. ON TAPE).

FOR USE WITH THE CD CYBER 70 SYSTEM, THE OBJECT CODE OF THE PROCEDURES IS AVAILABLE AND IT IS CONTAINED IN THE LIBRARY FILE "NUMAL3". THIS LIBRARY FILE CAN BE USED WHEN PROGRAMS COMPILED UNDER ALGOL 3 ARE LOADED.

FOR USE OF A LIBRARY FILE SEE E.G.

CDC SCOPE REF. MANUAL, CHAPTER 6;

CDC INTERCOM REF. MANUAL, CHAPTER 3, XEQ COMMAND.

A LIBRARY FILE FOR USE WITH PROGRAMS COMPILED UNDER ALGOL 4 IS IN PREPARATION.

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1. ELEMENTARY PROCEDURES				
1. REAL VECT AND MAT OPERATIONS				
1. INITIALIZATION				
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INIMAT	*	31011	APR/74	1
INIMATD	*	31012	APR/74	1
INISYHD	*	31013	APR/74	1
INISYHROM	*	31014	APR/74	1
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DUPVEC	*	31030	APR/74	3
DUPVECROM	*	31031	APR/74	3
DUPROWVEC	*	31032	APR/74	3
DUPVECCOL	*	31033	APR/74	3
DUPCOLVEC	*	31034	APR/74	3
DUPMAT	*	31035	APR/74	3
3. MULTIPLICATION				
MULVEC	*	31020	APR/74	5
MULROM	*	31021	APR/74	5
MULCOL	*	31022	APR/74	5
COLCST	*	31131	APR/74	5
ROMCST	*	31132	APR/74	5
4. SCALAR PRODUCTS				
1. VECTOR VECTOR PRODUCTS				
VECVEC	*	34010	DEC/75	7
MATVEC	*	34011	DEC/75	7
TARVEC	*	34012	DEC/75	7
HATHAT	*	34013	DEC/75	7
TAMHAT	*	34014	DEC/75	7
MATTAM	*	34015	DEC/75	7
SEQVEC	*	34016	DEC/75	7
SCAPRDI	*	34017	DEC/75	7
SYMHATVEC	*	34018	DEC/75	7
2. MATRIX VECTOR PRODUCTS				
FULHATVEC	*	31500	DEC/75	15
FULIAMVEC	*	31501	DEC/75	15
FULSYMHATVEC	*	31502	DEC/75	15
RESVEC	*	31503	DEC/75	15
SYHRESVEC	*	31504	DEC/75	15
3. MATRIX MATRIX PRODUCTS				
HSHVEC MAT	*	31070	JAN/76	269
HSHCOL MAT	*	31071	JAN/76	269
HSHROW MAT	*	31072	JAN/76	269
HSHVECTAM	*	31073	JAN/76	269
HSHCOLTAM	*	31074	JAN/76	269
HSHROWTAM	*	31075	JAN/76	269
5. ELIMINATION				
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ELMCOL	*	34023	APR/74	9
ELMROW	*	34024	APR/74	9
ELMVECCOL	*	34021	APR/74	9
ELMCOLVEC	*	34022	APR/74	9
ELMVECROW	*	34026	APR/74	9
ELMROWVEC	*	34027	APR/74	9
ELMCOLROW	*	34029	APR/74	9
ELMROWCOL	*	34028	APR/74	9

RECORD
NUMBER

MNT/YR

CODE

PROCEDURE

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				MAXELHROM	*	34025	APR/74		9
				ICHVEC	*	34030	APR/74		11
				ICHCOL	*	34031	APR/74		11
				ICHROW	*	34032	APR/74		11
				ICHROMCOL	*	34033	APR/74		11
				ICHSEQVEC	*	34034	APR/74		11
				ICHSEQ	*	34035	APR/74		11
				ROTCOL	*	34040	APR/74		13
				ROTRW	*	34041	APR/74		13
				INFNRHVEC	*	31061	OCT/75		241
				INFNRHROW	*	31062	OCT/75		241
				INFNRHCOL	*	31063	OCT/75		241
				INFNRHMAT	*	31064	OCT/75		241
				ONENRHVEC	*	31065	OCT/75		241
				ONENRHROW	*	31066	OCT/75		241
				ONENRHCOL	*	31067	OCT/75		241
				ONENRHMAT	*	31068	OCT/75		241
				ABSHAXMAT	*	31069	OCT/75		241
				REASCL	*	34103	APR/74		17
				COMCOLGST		34352	MAY/74		21
				COMROWCST		34353	MAY/74		21
				COMHATVEC		34354	MAY/74		23
				HSHCOMCOL		34355	MAY/74		23
				HSHCOMPRD		34356	MAY/74		23
				ELMCOMVECCOL		34376	MAY/74		25
				ELMCOMCOL		34377	MAY/74		25
				ELMCOMROWVEC		34378	MAY/74		25
				ROTCOMCOL		34357	JAN/76		27
				ROTCOMROW		34358	JAN/76		27
				GSHZ		34611	JAN/76		27
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				SGLCOM		34360	DEC/75		29
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7.ROTATION

8.NORMS

9.SCALING

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2.DYADIC OPERATIONS

1.

3.

2.

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- 5. LONG REAL ARITHMETIC
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 - 2. EVAL. OF ORTHOGON. POLYNOMIALS
 - 1. GENERAL ORTHOGON. POLYNOMIALS
 - 2. CHEBYSHEV POLYNOMIALS
 - 3. EVAL. OF TRIGONOM. POLYNOMIALS
 - 3. 1. EVAL. OF FOURIER SERIES

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(DECEMBER 1975)

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LNGINTDIVIDE	31203	OCT/74	201
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LNGMATVEC	* 34411	JAN/76	39
LNGTAMVEC	* 34412	JAN/76	39
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LNGIAMMAT	* 34414	JAN/76	39
LNGMATTAN	* 34415	JAN/76	39
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LNGFULSYHMATVEC	* 31507	JAN/76	285
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TAYPOL	31241	OCT/75	245
NORDERPOL	31242	OCT/75	245
DERPOL	31243	OCT/75	245
NEWPOL	31041	NOT YET AVAILABLE	
ORTPOL	31044	NOT YET AVAILABLE	
ALLORTPOL	31045	NOT YET AVAILABLE	
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2. CALCULATION OF DETERMINANT	CHLDEC1	34311	MAY/74	55
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4. MATRIX INVERSION	CHLSOL2	34390	MAY/74	59
	CHLSOL1	34391	MAY/74	59
	CHLDECSOL2	34392	MAY/74	59
	CHLDECSOL1	34393	MAY/74	59
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	CHLDECINV2	34402	MAY/74	61
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2. COMPLEX MATRICES 1. HERMITIAN MATRICES	BAKREAHES1	34171	JUN/74	103
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2. NON-HERMITIAN MATRICES	HSHRMTRI	34363	JUN/74	105
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2. OTHER TRANSFORMATIONS 1. TRANS TO BIDIAGONAL FORM 1. REAL MATRICES	BAKHMTRI	34365	JUN/74	105
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2. COMPLEX MATRICES 1. SYMMETRIC MATRICES 1. TRIDIAGONAL MATRICES	BAKCOMHES	34367	JUN/74	107
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SEE ALSO PROC. MULTISTEP (5.2.1.1.1.1)

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31507	1. 5. 2. 2.	LNGFULSYMMATVEC	JAN/76
31508	1. 5. 2. 2.	LNGRESVEC	* JAN/76
31509	1. 5. 2. 2.	LNGSYMRESVEC	JAN/76
32010	4. 1.	EULER	JUL/74
32020	4. 1.	SUMPOSSERIES	JUL/74

CODE	SECTION	PROCEDURE	MNT/YR
32051	4. 2. 1.	INTEGRAL	JUL/74
32070	4. 2. 1.	QADRAT	JUL/74
32075	4. 2. 2.	TRICUB	OCT/75
33010	5. 2. 1. 1. 1. 1.	RK1	AUG/74
33011	OBSOLETE PROCEDURE	RK1N	
33012	5. 2. 1. 1. 2. 1.	RK2	AUG/74
33013	5. 2. 1. 1. 2. 1.	RK2N	AUG/74
33014	5. 2. 1. 1. 2. 1.	RK3	AUG/74
33015	5. 2. 1. 1. 2. 1.	RK3N	AUG/74
33016	5. 2. 1. 1. 1. 1.	RK4A	AUG/74
33017	5. 2. 1. 1. 1. 1.	RK4NA	AUG/74
33018	5. 2. 1. 1. 1. 1.	RK5NA	AUG/74
33033	5. 2. 1. 1. 1. 1.	RKE	DEC/75
33040	5. 2. 1. 1. 1. 3.	MODIFIED TAYLOR	AUG/74
33050	5. 2. 1. 1. 1. 3.	EXPONENTIALLY FITTED TAYLOR	AUG/74
33061	5. 2. 1. 1. 1. 1.	ARK	DEC/75
33070	5. 2. 1. 1. 1. 1.	EFRK	AUG/74
33080	5. 2. 1. 1. 1. 1.	MULTISTEP	AUG/74
33120	5. 2. 1. 1. 1. 2.	EFERK	AUG/74
33130	OBSOLETE PROCEDURE	LINIGER1	AUG/74
33131	5. 2. 1. 1. 1. 2.	LINIGER2	AUG/74
33132	5. 2. 1. 1. 1. 2.	LINIGER1VS	OCT/74
33135	5. 2. 1. 1. 1. 2.	IMPEX	OCT/75
33160	5. 2. 1. 1. 1. 2.	EFSIRK	AUG/74
33170	5. 2. 1. 2. 2. 1. 2.	RICHARDSON	OCT/74
33171	5. 2. 1. 2. 2. 1. 2.	ELIMINATION	OCT/74
33180	5. 2. 1. 1. 1. 1.	DIFFSYS	AUG/74
33191	5. 2. 1. 1. 1. 2.	GMS	OCT/74
33300	5. 2. 1. 2. 1. 2. 1. 1.	FEM LAG	JAN/76
33301	5. 2. 1. 2. 1. 2. 1. 1.	FEM LAG SYM	JAN/76
33302	5. 2. 1. 2. 1. 2. 1. 2.	FEM LAG SKEW	JAN/76
33303	5. 2. 1. 2. 1. 2. 2. 1.	FEM HERM SYM	JAN/76
34010	1. 1. 4. 1.	VECVEC	* DEC/75
34011	1. 1. 4. 1.	MATVEC	* DEC/75
34012	1. 1. 4. 1.	TAMVEC	* DEC/75
34013	1. 1. 4. 1.	MATHAT	* DEC/75
34014	1. 1. 4. 1.	TAMHAT	* DEC/75
34015	1. 1. 4. 1.	MATTAM	* DEC/75
34016	1. 1. 4. 1.	SEQVEC	* DEC/75
34017	1. 1. 4. 1.	SCAPRD1	* DEC/75
34018	1. 1. 4. 1.	SYMMATVEC	DEC/75
34020	1. 1. 5.	ELMVEC	* APR/74
34021	1. 1. 5.	ELMVECCOL	* APR/74
34022	1. 1. 5.	ELMCOLVEC	* APR/74
34023	1. 1. 5.	ELMCOL	* APR/74
34024	1. 1. 5.	ELMROW	* APR/74
34025	1. 1. 5.	MAXELMROW	* APR/74
34026	1. 1. 5.	ELMVECROW	* APR/74
34027	1. 1. 5.	ELMROWVEC	* APR/74
34028	1. 1. 5.	ELMROWCOL	* APR/74
34029	1. 1. 5.	ELMROWCOL	* APR/74

CODE	SECTION	PROCEDURE	MNT/YR
34030	1. 1. 6.	ICHVEC	* APR/74
34031	1. 1. 6.	ICHCOL	* APR/74
34032	1. 1. 6.	ICHROW	* APR/74
34033	1. 1. 6.	ICHROWCOL	* APR/74
34034	1. 1. 6.	ICHSEQVEC	* APR/74
34035	1. 1. 6.	ICHSEQ	* APR/74
34040	1. 1. 7.	ROTCOL	* APR/74
34041	1. 1. 7.	ROTRON	* APR/74
34050	OBSOLETE PROCEDURE	DET	
34051	3. 1. 1. 1. 1. 1. 3.	SOL	MAY/74
34053	3. 1. 1. 1. 1. 1. 4.	INV	MAY/74
34061	3. 1. 1. 1. 1. 1. 3.	SOLELM	MAY/74
34071	3. 1. 2. 1. 1. 1. 1. 3.	SOLBND	JUN/74
34130	OBSOLETE PROCEDURE	LSQDEC	
34131	3. 1. 1. 2. 1. 2.	LSQSOL	MAY/74
34132	3. 1. 1. 2. 1. 1.	LSQDGLINV	MAY/74
34134	3. 1. 1. 2. 1. 1.	LSQORTDEC	MAY/74
34135	3. 1. 1. 2. 1. 2.	LSQORTDECSOL	MAY/74
34136	3. 1. 1. 2. 1. 3.	LSQINV	OCT/74
34140	3. 2. 1. 2. 1. 1.	TFMSYMTRI2	JUN/74
34141	3. 2. 1. 2. 1. 1.	BAKSYMTRI2	JUN/74
34142	3. 2. 1. 2. 1. 1.	TFMPREVEC	JUN/74
34143	3. 2. 1. 2. 1. 1.	TFMSYMTRI1	JUN/74
34144	3. 2. 1. 2. 1. 1.	BAKSYMTRI1	JUN/74
34150	5. 1. 1. 1. 1.	ZEROIN	OCT/75
34151	3. 3. 1. 1. 1.	VALSYMTRI	JUL/74
34152	3. 3. 1. 1. 1.	VECSYMTRI	JUL/74
34153	3. 3. 1. 1. 2.	EIGVALSYM2	JUL/74
34154	3. 3. 1. 1. 2.	EIGSYM2	JUL/74
34155	3. 3. 1. 1. 2.	EIGVALSYM1	JUL/74
34156	3. 3. 1. 1. 2.	EIGSYM1	JUL/74
34160	3. 3. 1. 1. 1.	QRIVALSYMTRI	JUL/74
34161	3. 3. 1. 1. 1.	QRISYMTRI	JUL/74
34162	3. 3. 1. 1. 2.	QRIVALSYM2	JUL/74
34163	3. 3. 1. 1. 2.	QRISYM	JUL/74
34164	3. 3. 1. 1. 2.	QRIVALSYM1	JUL/74
34166	3. 3. 1. 1. 1.	RATQRI	
34170	3. 2. 1. 2. 1. 2.	TFMREAHEs	JUN/74
34171	3. 2. 1. 2. 1. 2.	BAKREAHEs1	JUN/74
34172	3. 2. 1. 2. 1. 2.	BAKREAHEs2	JUN/74
34173	3. 2. 1. 1. 1.	EQILBR	JUN/74
34174	3. 2. 1. 1. 1.	BAKLBR	JUN/74
34180	3. 3. 1. 2. 1.	REAVALQRI	JUL/74
34181	3. 3. 1. 2. 1.	REAVECHES	JUL/74
34182	3. 3. 1. 2. 2.	REAEIGVAL	JUL/74
34183	1. 1. 9.	REASCL	APR/74
34184	3. 3. 1. 2. 2.	REAEIG1	JUL/74
34185	3. 3. 1. 2. 2.	REAEIG2	
34186	3. 3. 1. 2. 1.	REAQRI	JUL/74
34187	3. 3. 1. 2. 2.	REAEIG3	JUL/74
34190	3. 3. 1. 2. 1.	COMVALQRI	JUL/74

CODE	SECTION	PROCEDURE	MNT/YR
34191	3. 3. 1. 2. 1.	COMVECHES	JUL/74
34192	3. 3. 1. 2. 2.	COMEIGVAL	JUL/74
34193	1. 2. 9.	COMSCL	DEC/75
34194	3. 3. 1. 2. 2.	COMEIG1	JUL/74
34195	3. 3. 1. 2. 2.	COMEIG2	
34200	5. 1. 1. 2. 3.	DAMPED NEWTON	
34202	5. 1. 1. 2. 3.	NEWRAP	
34203	5. 1. 2. 2. 4.	NEWTONMIN	
34210	5. 1. 2. 2. 1.	LINEMIN	DEC/75
34211	5. 1. 2. 2. 1.	RNK1UPD	DEC/75
34212	5. 1. 2. 2. 1.	DAVUPD	DEC/75
34213	5. 1. 2. 2. 1.	FLEUPD	DEC/75
34214	5. 1. 2. 2. 3.	RNK1MIN	DEC/75
34215	5. 1. 2. 2. 3.	FLEMIN	DEC/75
34220	3. 1. 2. 2. 1.	CONJ GRAD	JUN/74
34221	3. 1. 2. 2. 1.	CONJ RESI	
34230	OBSOLETE PROCEDURE	MAXMAT	
34231	3. 1. 1. 1. 1. 1. 1.	GSSELM	MAY/74
34232	3. 1. 1. 1. 1. 1. 3.	GSSSOL	MAY/74
34235	3. 1. 1. 1. 1. 1. 4.	INV1	MAY/74
34236	3. 1. 1. 1. 1. 1. 4.	GSSINV	MAY/74
34240	3. 1. 1. 1. 1. 1. 1.	ONENRMINV	MAY/74
34241	3. 1. 1. 1. 1. 1. 1.	ERBELM	MAY/74
34242	3. 1. 1. 1. 1. 1. 1.	GSSERB	MAY/74
34243	3. 1. 1. 1. 1. 1. 3.	GSSSOLERB	MAY/74
34244	3. 1. 1. 1. 1. 1. 4.	GSSINVERB	MAY/74
34250	3. 1. 1. 1. 1. 1. 5.	ITISOL	MAY/74
34251	3. 1. 1. 1. 1. 1. 5.	GSSITISOL	MAY/74
34252	3. 1. 1. 1. 1. 1. 1.	GSSNRI	MAY/74
34253	3. 1. 1. 1. 1. 1. 5.	ITISOLERB	MAY/74
34254	3. 1. 1. 1. 1. 1. 5.	GSSITISOLERB	MAY/74
34260	3. 2. 2. 1. 1.	HSHREABID	JUN/74
34261	3. 2. 2. 1. 1.	PSTTFMMAT	JUN/74
34262	3. 2. 2. 1. 1.	PRETFMMAT	JUN/74
34270	3. 5. 1. 1.	QRISNGVALBID	JUL/74
34271	3. 5. 1. 1.	QRISNGVALDECBI	JUL/74
34272	3. 5. 1. 2.	QRISNGVAL	JUL/74
34273	3. 5. 1. 2.	QRISNGVALDEC	JUL/74
34280	3. 1. 1. 3. 1. 1.	SOLSVDOVR	MAY/74
34281	3. 1. 1. 3. 1. 1.	SOLOVR	MAY/74
34282	3. 1. 1. 3. 1. 2.	SOLSVDUND	MAY/74
34283	3. 1. 1. 3. 1. 2.	SOLUND	MAY/74
34284	3. 1. 1. 3. 1. 3.	HOMSOLSVD	MAY/74
34285	3. 1. 1. 3. 1. 3.	HOMSOL	MAY/74
34286	3. 1. 1. 3. 1. 4.	PSDINVSVD	MAY/74
34287	3. 1. 1. 3. 1. 4.	PSDINV	MAY/74
34300	3. 1. 1. 1. 1. 1. 1.	DEC	MAY/74
34301	3. 1. 1. 1. 1. 1. 3.	DECSOL	MAY/74
34302	3. 1. 1. 1. 1. 1. 4.	DECINV	MAY/74
34303	3. 1. 1. 1. 1. 1. 2.	DETERM	MAY/74
34310	3. 1. 1. 1. 1. 2. 1.	CHLDEC2	MAY/74

CODE	SECTION	PROCEDURE	MNT/YR
34311	3. 1. 1. 1. 1. 2. 1.	CHLDEC1	MAY/74
34312	3. 1. 1. 1. 1. 2. 2.	CHLDETERM2	MAY/74
34313	3. 1. 1. 1. 1. 2. 2.	CHLDETERM1	MAY/74
34320	3. 1. 2. 1. 1. 1. 1. 1.	DECBND	JUN/74
34321	3. 1. 2. 1. 1. 1. 1. 2.	DETERMBND	JUN/74
34322	3. 1. 2. 1. 1. 1. 1. 3.	DECSOLBND	JUN/74
34330	3. 1. 2. 1. 1. 2. 1. 1.	CHLDECBND	JUN/74
34331	3. 1. 2. 1. 1. 2. 1. 2.	CHLDETERMBND	JUN/74
34332	3. 1. 2. 1. 1. 2. 1. 3.	CHLSOLBND	JUN/74
34333	3. 1. 2. 1. 1. 2. 1. 3.	CHLDECSOLBND	JUN/74
34340	1. 3. 1.	COMABS	MAY/74
34341	1. 3. 2.	COMMUL	MAY/74
34342	1. 3. 2.	COMDIV	MAY/74
34343	1. 3. 1.	COMSQRT	MAY/74
34344	1. 3. 1.	CARPOL	MAY/74
34345	3. 6. 3.	COMKWD	JUL/74
34352	1. 2. 3.	COMCOLCST	MAY/74
34353	1. 2. 3.	COMROWCST	MAY/74
34354	1. 2. 4.	COMMATVEC	MAY/74
34355	1. 2. 4.	HSHCOMCOL	MAY/74
34356	1. 2. 4.	HSHCOMPRD	MAY/74
34357	1. 2. 7.	ROTCOMCOL	JAN/76
34358	1. 2. 7.	ROTCOMROW	JAN/76
34359	1. 2. 8.	COMEUCNRM	DEC/75
34360	1. 2. 9.	SCLCOM	DEC/75
34361	3. 2. 1. 1. 2.	EQILBRCOM	JUN/74
34362	3. 2. 1. 1. 2.	BAKLBRCOM	JUN/74
34363	3. 2. 1. 2. 2. 1.	HSHHRMTRI	JUN/74
34364	3. 2. 1. 2. 2. 1.	HSHHRMTRIVAL	JUN/74
34365	3. 2. 1. 2. 2. 1.	BAKHRMTRI	JUN/74
34366	3. 2. 1. 2. 2. 2.	HSHCOMHES	JUN/74
34367	3. 2. 1. 2. 2. 2.	BAKCOMHES	JUN/74
34368	3. 3. 2. 1.	EIGVALHRM	JUL/74
34369	3. 3. 2. 1.	EIGHRM	JUL/74
34370	3. 3. 2. 1.	QRIVALHRM	JUL/74
34371	3. 3. 2. 1.	QRIHRM	JUL/74
34372	3. 3. 2. 2. 1.	VALQRICOM	JUL/74
34373	3. 3. 2. 2. 1.	QRICOM	JUL/74
34374	3. 3. 2. 2. 2.	EIGVALCOM	JUL/74
34375	3. 3. 2. 2. 2.	EIGCOM	JUL/74
34376	1. 2. 5.	ELMCOMVECCOL	MAY/74
34377	1. 2. 5.	ELMCOMCOL	MAY/74
34378	1. 2. 5.	ELMCOMROWVEC	MAY/74
34390	3. 1. 1. 1. 1. 2. 3.	CHLSOL2	MAY/74
34391	3. 1. 1. 1. 1. 2. 3.	CHLSOL1	MAY/74
34392	3. 1. 1. 1. 1. 2. 3.	CHLDECSOL2	MAY/74
34393	3. 1. 1. 1. 1. 2. 3.	CHLDECSOL1	MAY/74
34400	3. 1. 1. 1. 1. 2. 4.	CHLINV2	MAY/74
34401	3. 1. 1. 1. 1. 2. 4.	CHLINV1	MAY/74
34402	3. 1. 1. 1. 1. 2. 4.	CHLDECINV2	MAY/74
34403	3. 1. 1. 1. 1. 2. 4.	CHLDECINV1	MAY/74

CODE	SECTION	PROCEDURE	MNT/YR
34410	1. 5. 2. 1.	LNGVECVEC	* JAN/76
34411	1. 5. 2. 1.	LNGMATVEC	* JAN/76
34412	1. 5. 2. 1.	LNGTAMVEC	* JAN/76
34413	1. 5. 2. 1.	LNGMATMAT	* JAN/76
34414	1. 5. 2. 1.	LNGTAMMAT	* JAN/76
34415	1. 5. 2. 1.	LNGMATTAM	* JAN/76
34416	1. 5. 2. 1.	LNGSEQVEC	* JAN/76
34417	1. 5. 2. 1.	LNGSCAPRD1	* JAN/76
34418	1. 5. 2. 1.	LNGSYMMATVEC	JAN/76
34420	3. 1. 2. 1. 1. 2. 2. 1.	DECSYMTRI	JUN/74
34421	3. 1. 2. 1. 1. 2. 2. 3.	SOLSYMTRI	JUN/74
34422	3. 1. 2. 1. 1. 2. 2. 3.	DECSOLSYMTRI	JUN/74
34423	3. 1. 2. 1. 1. 1. 2. 1.	DECTRI	JUN/74
34424	3. 1. 2. 1. 1. 1. 2. 3.	SOLTRI	JUN/74
34425	3. 1. 2. 1. 1. 1. 2. 3.	DECSOLTRI	JUN/74
34426	3. 1. 2. 1. 1. 1. 2. 1.	DECTRIPIV	JUN/74
34427	3. 1. 2. 1. 1. 1. 2. 3.	SOLTRIPIV	JUN/74
34428	3. 1. 2. 1. 1. 1. 2. 3.	DECSOLTRIPIV	JUN/74
34430	5. 1. 1. 2. 2.	QUANEWBND	OCT/74
34431	5. 1. 1. 2. 2.	QUANEWBND1	OCT/74
34432	5. 1. 2. 2. 2.	PRAXIS	OCT/75
34433	5. 1. 2. 1. 1.	MININ	OCT/75
34435	5. 1. 2. 1. 2.	MININDER	OCT/75
34436	5. 1. 1. 1. 1.	ZEROINRAT	OCT/75
34437	4. 3. 2. 1.	JACOBNNF	OCT/74
34438	4. 3. 2. 1.	JACOBNMF	OCT/74
34439	4. 3. 2. 1.	JACOBNBNDF	OCT/74
34440	5. 1. 3. 1. 3.	MARQUARDT	DEC/75
34441	5. 1. 3. 1. 3.	GSSNEWTON	DEC/75
34444	5. 2. 1. 3. 1.	PEIDE	OCT/75
34450	5. 1. 1. 2. 2.	BROWNLIS	
34451	5. 1. 1. 2. 2.	QUANEW	
34452	5. 1. 1. 2. 2.	QUANEW1	
34453	5. 1. 1. 1. 2.	ZEROINDER	OCT/75
34500	3. 6. 1.	POLZEROS	OCT/74
34600	3. 4. 1. 2.	QZIVAL	JAN/76
34601	3. 4. 1. 2.	QZI	JAN/76
34602	3. 4. 1. 2.	HSHDECMUL	JAN/76
34603	3. 4. 1. 2.	HSTGL3	JAN/76
34604	3. 4. 1. 2.	HSTGL2	JAN/76
34605	3. 4. 1. 2.	HSH2COL	JAN/76
34606	3. 4. 1. 2.	HSH3COL	JAN/76
34607	3. 4. 1. 2.	HSH2ROW3	JAN/76
34608	3. 4. 1. 2.	HSH2ROW2	JAN/76
34609	3. 4. 1. 2.	HSH3ROW3	JAN/76
34610	3. 4. 1. 2.	HSH3ROW2	JAN/76
34611	1. 2. 7.	CHSH2	JAN/76
34700	3. 1. 1. 1. 1. 3. 1.	SYMDEC2	JAN/76
34701	3. 1. 1. 1. 1. 3. 1.	SYMDEC1	JAN/76
34702	3. 1. 1. 1. 1. 3. 2.	SYMDETERM2	JAN/76
34703	3. 1. 1. 1. 1. 3. 2.	SYMDETERM1	JAN/76

CODE	SECTION	PROCEDURE	MNT/YR
34311	3. 1. 1. 1. 1. 2. 1.	CHLDEC1	MAY/74
34312	3. 1. 1. 1. 1. 2. 2.	CHLDETERM2	MAY/74
34313	3. 1. 1. 1. 1. 2. 2.	CHLDETERM1	MAY/74
34320	3. 1. 2. 1. 1. 1. 1. 1.	DECBND	JUN/74
34321	3. 1. 2. 1. 1. 1. 1. 2.	DETERMBND	JUN/74
34322	3. 1. 2. 1. 1. 1. 1. 3.	DECSOLBND	JUN/74
34330	3. 1. 2. 1. 1. 2. 1. 1.	CHLDECSBND	JUN/74
34331	3. 1. 2. 1. 1. 2. 1. 2.	CHLDETERMBND	JUN/74
34332	3. 1. 2. 1. 1. 2. 1. 3.	CHLSOLBND	JUN/74
34333	3. 1. 2. 1. 1. 2. 1. 3.	CHLDECSOLBND	JUN/74
34340	1. 3. 1.	COMABS	MAY/74
34341	1. 3. 2.	COMMUL	MAY/74
34342	1. 3. 2.	COMDIV	MAY/74
34343	1. 3. 1.	COMSQT	MAY/74
34344	1. 3. 1.	CARPOL	MAY/74
34345	3. 6. 3.	COMKWD	JUL/74
34352	1. 2. 3.	COMCOLCST	MAY/74
34353	1. 2. 3.	COMROWCST	MAY/74
34354	1. 2. 4.	COMMATVEC	MAY/74
34355	1. 2. 4.	HSHCOMCOL	MAY/74
34356	1. 2. 4.	HSHCOMPRD	MAY/74
34357	1. 2. 7.	ROTCOMCOL	JAN/76
34358	1. 2. 7.	ROTCOMROW	JAN/76
34359	1. 2. 8.	COMEUCNRM	DEC/75
34360	1. 2. 9.	SCLCOM	DEC/75
34361	3. 2. 1. 1. 2.	EQILBRCOM	JUN/74
34362	3. 2. 1. 1. 2.	BAKLBRCOM	JUN/74
34363	3. 2. 1. 2. 2. 1.	HSHHRMTRI	JUN/74
34364	3. 2. 1. 2. 2. 1.	HSHHRMTRIVAL	JUN/74
34365	3. 2. 1. 2. 2. 1.	BAKHRMTRI	JUN/74
34366	3. 2. 1. 2. 2. 2.	HSHCOMHES	JUN/74
34367	3. 2. 1. 2. 2. 2.	BAKCOMHES	JUN/74
34368	3. 3. 2. 1.	EIGVALHRM	JUL/74
34369	3. 3. 2. 1.	EIGHRM	JUL/74
34370	3. 3. 2. 1.	QRIVALHRM	JUL/74
34371	3. 3. 2. 1.	QRIHRM	JUL/74
34372	3. 3. 2. 2. 1.	VALQRICOM	JUL/74
34373	3. 3. 2. 2. 1.	QRICOM	JUL/74
34374	3. 3. 2. 2. 2.	EIGVALCOM	JUL/74
34375	3. 3. 2. 2. 2.	EIGCOM	JUL/74
34376	1. 2. 5.	ELMCOMVECCOL	MAY/74
34377	1. 2. 5.	ELMCOMCOL	MAY/74
34378	1. 2. 5.	ELMCOMROWVEC	MAY/74
34390	3. 1. 1. 1. 1. 2. 3.	CHLSOL2	MAY/74
34391	3. 1. 1. 1. 1. 2. 3.	CHLSOL1	MAY/74
34392	3. 1. 1. 1. 1. 2. 3.	CHLDECSOL2	MAY/74
34393	3. 1. 1. 1. 1. 2. 3.	CHLDECSOL1	MAY/74
34400	3. 1. 1. 1. 1. 2. 4.	CHLINV2	MAY/74
34401	3. 1. 1. 1. 1. 2. 4.	CHLINV1	MAY/74
34402	3. 1. 1. 1. 1. 2. 4.	CHLDECINV2	MAY/74
34403	3. 1. 1. 1. 1. 2. 4.	CHLDECINV1	MAY/74

CODE	SECTION	PROCEDURE	MNT/YR
34410	1. 5. 2. 1.	LNGVECVEC	* JAN/76
34411	1. 5. 2. 1.	LNGMATVEC	* JAN/76
34412	1. 5. 2. 1.	LNGTAMVEC	* JAN/76
34413	1. 5. 2. 1.	LNGMATMAT	* JAN/76
34414	1. 5. 2. 1.	LNGTAMMAT	* JAN/76
34415	1. 5. 2. 1.	LNGMATTAM	* JAN/76
34416	1. 5. 2. 1.	LNGSEQVEC	* JAN/76
34417	1. 5. 2. 1.	LNGSCAPRD1	* JAN/76
34418	1. 5. 2. 1.	LNGSYMMATVEC	JAN/76
34420	3. 1. 2. 1. 1. 2. 2. 1.	DECSYMTRI	JUN/74
34421	3. 1. 2. 1. 1. 2. 2. 3.	SOLSYMTRI	JUN/74
34422	3. 1. 2. 1. 1. 2. 2. 3.	DECSOLSYMTRI	JUN/74
34423	3. 1. 2. 1. 1. 1. 2. 1.	DECTRI	JUN/74
34424	3. 1. 2. 1. 1. 1. 2. 3.	SOLTRI	JUN/74
34425	3. 1. 2. 1. 1. 1. 2. 3.	DECSOLTRI	JUN/74
34426	3. 1. 2. 1. 1. 1. 2. 1.	DECTRIPIV	JUN/74
34427	3. 1. 2. 1. 1. 1. 2. 3.	SOLTRIPIV	JUN/74
34428	3. 1. 2. 1. 1. 1. 2. 3.	DECSOLTRIPIV	JUN/74
34430	5. 1. 1. 2. 2.	QUANEBND	OCT/74
34431	5. 1. 1. 2. 2.	QUANEBND1	OCT/74
34432	5. 1. 2. 2. 2.	PRAXIS	OCT/75
34433	5. 1. 2. 1. 1.	MININ	OCT/75
34435	5. 1. 2. 1. 2.	MININDER	OCT/75
34436	5. 1. 1. 1. 1.	ZEROINRAT	OCT/75
34437	4. 3. 2. 1.	JACOBNNF	OCT/74
34438	4. 3. 2. 1.	JACOBNMF	OCT/74
34439	4. 3. 2. 1.	JACOBNBNDF	OCT/74
34440	5. 1. 3. 1. 3.	MARQUARDT	DEC/75
34441	5. 1. 3. 1. 3.	GSSNEWTON	DEC/75
34444	5. 2. 1. 3. 1.	PEIDE	OCT/75
34450	5. 1. 1. 2. 2.	BROWNL5	
34451	5. 1. 1. 2. 2.	QUANEW	
34452	5. 1. 1. 2. 2.	QUANEW1	
34453	5. 1. 1. 1. 2.	ZEROINDER	OCT/75
34500	3. 6. 1.	POLZEROS	OCT/74
34600	3. 4. 1. 2.	QZIVAL	JAN/76
34601	3. 4. 1. 2.	QZI	JAN/76
34602	3. 4. 1. 2.	HSHDECMUL	JAN/76
34603	3. 4. 1. 2.	HESTGL3	JAN/76
34604	3. 4. 1. 2.	HESTGL2	JAN/76
34605	3. 4. 1. 2.	HSH2COL	JAN/76
34606	3. 4. 1. 2.	HSH3COL	JAN/76
34607	3. 4. 1. 2.	HSH2ROW3	JAN/76
34608	3. 4. 1. 2.	HSH2ROW2	JAN/76
34609	3. 4. 1. 2.	HSH3ROW3	JAN/76
34610	3. 4. 1. 2.	HSH3ROW2	JAN/76
34611	1. 2. 7.	CHSH2	JAN/76
34700	3. 1. 1. 1. 1. 3. 1.	SYMDEC2	JAN/76
34701	3. 1. 1. 1. 1. 3. 1.	SYMDEC1	JAN/76
34702	3. 1. 1. 1. 1. 3. 2.	SYMDETERM2	JAN/76
34703	3. 1. 1. 1. 1. 3. 2.	SYMDETERM1	JAN/76

CODE	SECTION	PROCEDURE	MNT/YR
34704	3. 1. 1. 1. 1. 3. 3.	SYMSOL2	JAN/76
34705	3. 1. 1. 1. 1. 3. 3.	SYMSOL1	JAN/76
34706	3. 1. 1. 1. 1. 3. 3.	SYMDECSOL2	JAN/76
34707	3. 1. 1. 1. 1. 3. 3.	SYMDECSOL1	JAN/76
34708	3. 1. 1. 1. 1. 3. 4.	SYMINV2	JAN/76
34709	3. 1. 1. 1. 1. 3. 4.	SYMINV1	JAN/76
34710	3. 1. 1. 1. 1. 3. 4.	SYMDECINV2	JAN/76
34711	3. 1. 1. 1. 1. 3. 4.	SYMDECINV1	JAN/76
35020	OBSOLETE PROCEDURE	ERF	
35021	6. 7.	ERRORFUNCTION	OCT/74
35022	6. 7.	NONEXPERFC	OCT/74
35023	6. 7.	INVERSE ERROR FUNCTION	OCT/74
35027	6. 7.	FRESNEL	OCT/74
35028	6. 7.	FG	OCT/74
35030	6. 6.	INCOMGAM	SEP/74
35038	OBSOLETE PROCEDURE	NONEXPK0	
35040	OBSOLETE PROCEDURE	K0	
35050	6. 6.	INCBETA	SEP/74
35051	6. 6.	IBPPLUSN	SEP/74
35052	6. 6.	IBQPLUSN	SEP/74
35053	6. 6.	IXQFIX	SEP/74
35054	6. 6.	IXPFIX	SEP/74
35055	6. 6.	FORWARD	SEP/74
35056	6. 6.	BACKWARD	SEP/74
35060	6. 6.	RECIP GAMMA	SEP/74
35061	6. 6.	GAMMA	SEP/74
35062	6. 6.	LOG GAMMA	SEP/74
35071	OBSOLETE PROCEDURE	KA	
35072	OBSOLETE PROCEDURE	KAPLUSN	
35073	OBSOLETE PROCEDURE	NONEXPKA	
35074	OBSOLETE PROCEDURE	NONEXPKAPLUSN	
35075	OBSOLETE PROCEDURE	YA	
35076	OBSOLETE PROCEDURE	YAPLUSN	
35077	OBSOLETE PROCEDURE	BESSELPQ	
35080	6. 5. 1.	EI	SEP/74
35081	6. 5. 1.	EI ALPHA	SEP/74
35083	2. 3.	JFRAC	MAY/74
35084	6. 5. 2.	SINCOSINT	SEP/74
35085	6. 5. 2.	SINCOSFG	SEP/74
35086	6. 5. 1.	ENX	SEP/74
35087	6. 5. 1.	NONEXP ENX	SEP/74
35100	OBSOLETE PROCEDURE	BESSELJ	
35101	OBSOLETE PROCEDURE	BESSELY	
35102	OBSOLETE PROCEDURE	BESSELI	
35103	OBSOLETE PROCEDURE	BESSELK	
35104	OBSOLETE PROCEDURE	NONEXPBESSELI	
35105	OBSOLETE PROCEDURE	NONEXPBESSELK	
35111	6. 4. 2.	SINH	SEP/74
35112	6. 4. 2.	COSH	SEP/74
35113	6. 4. 2.	TANH	SEP/74
35114	6. 4. 2.	ARCSINH	SEP/74

CODE	SECTION	PROCEDURE	MNT/YR
35115	6. 4. 2.	ARCCOSH	SEP/74
35116	6. 4. 2.	ARCTANH	SEP/74
35120	6. 4. 1.	TAN	SEP/74
35121	6. 4. 1.	ARCSIN	SEP/74
35122	6. 4. 1.	ARCCOS	SEP/74
35140	6.10. 4.	AIRY	OCT/75
35145	6.10. 4.	AIRYZEROS	OCT/75
35150	6.10. 3.	SPHER BESS J	OCT/75
35151	6.10. 3.	SPHER BESS Y	OCT/75
35152	6.10. 3.	SPHER BESS I	OCT/75
35153	6.10. 3.	SPHER BESS K	OCT/75
35154	6.10. 3.	NONEXP SPHER BESS I	OCT/75
35155	6.10. 3.	NONEXP SPHER BESS K	OCT/75
35160	6. 9. 1.	BESS J0	OCT/75
35161	6. 9. 1.	BESS J1	OCT/75
35162	6. 9. 1.	BESS J	OCT/75
35163	6. 9. 1.	BESS Y01	OCT/75
35164	6. 9. 1.	BESS Y	OCT/75
35165	6. 9. 1.	BESS PQ0	OCT/75
35166	6. 9. 1.	BESS PQ1	OCT/75
35170	6. 9. 2.	BESS I0	OCT/75
35171	6. 9. 2.	BESS I1	OCT/75
35172	6. 9. 2.	BESS I	OCT/75
35173	6. 9. 2.	BESS K01	OCT/75
35174	6. 9. 2.	BESS K	OCT/75
35175	6. 9. 2.	NONEXP BESS I0	OCT/75
35176	6. 9. 2.	NONEXP BESS I1	OCT/75
35177	6. 9. 2.	NONEXP BESS I	OCT/75
35178	6. 9. 2.	NONEXP BESS K01	OCT/75
35179	6. 9. 2.	NONEXP BESS K	OCT/75
35180	6.10. 1.	BESS JAPLUSN	OCT/75
35181	6.10. 1.	BESS YA01	OCT/75
35182	6.10. 1.	BESS YAPLUSN	OCT/75
35183	6.10. 1.	BESS PQA01	OCT/75
35190	6.10. 2.	BESS IAPLUSN	OCT/75
35191	6.10. 2.	BESS KA01	OCT/75
35192	6.10. 2.	BESS KAPLUSN	OCT/75
35193	6.10. 2.	NONEXP BESS IAPLUSN	OCT/75
35194	6.10. 2.	NONEXP BESS KA01	OCT/75
35195	6.10. 2.	NONEXP BESS KAPLUSN	OCT/75
36010	7. 1. 1. 1. 1.	NEWTON	SEP/74
36020	7. 1. 3. 2. 1.	INI	DEC/75
36021	7. 1. 3. 2. 1.	SNDREMEZ	DEC/75
36022	7. 1. 3. 2. 1.	MINMAXPOL	OCT/75
39998	9.	WRITE	
39999	9.	READ	

IN THIS KEY WORD IN CONTEXT (KWIC) INDEX KEY WORDS AND PROCEDURE NAMES ARE ORDERED ALPHABETICALLY.

THE KWIC INDEX IS BASED UPON PROGRAM ABSTRACT SUCH AS:

32070 #QADRAT (#QUADRATURE) COMPUTES THE #DEFINITE #INTEGRAL OF A #FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL.

THE ABSTRACT COMPRISES THE CODE NUMBER AND A SHORT DESCRIPTION OF THE PROGRAM (ITS NAME, WHAT IT DOES, AND HOW IT DOES IT).

THE "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:

QADRAT COMPUTES THE .DEFINITE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL. 32070 133

IF THIS PROGRAM (QADRAT) IS OF INTEREST, YOU CAN LOCATE IT BY MEANS OF ITS CODE NUMBER (32070).

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 LISTING (BY CODE NUMBER) OF ALL THE ABSTRACTS FOLLOWING THE KWIC INDEX.

SINCE ALL PROCEDURE NAMES HAVE BEEN INSERTED AS KEYWORDS, THE KWIC INDEX CAN ALSO BE USED TO TRACE A PROCEDURE BY ITS NAME.

ULATES THE MODIFIED SPHERICAL
 BESS JAPLUSN CALCULATES THE
 PLUSN CALCULATES THE MODIFIED
 PLUSN CALCULATES THE MODIFIED
 ESS J CALCULATES THE ORDINARY
 ESS I CALCULATES THE MODIFIED
 ULATES THE MODIFIED SPHERICAL
 SS J CALCULATES THE SPHERICAL
 BESS YA01 CALCULATES THE
 ESS Y CALCULATES THE ORDINARY
 S Y01 CALCULATES THE ORDINARY
 ULATES THE MODIFIED SPHERICAL
 KA01 CALCULATES THE MODIFIED
 KA01 CALCULATES THE MODIFIED
 PLUSN CALCULATES THE MODIFIED
 PLUSN CALCULATES THE MODIFIED
 ESS K CALCULATES THE MODIFIED
 ESS K CALCULATES THE MODIFIED
 S K01 CALCULATES THE MODIFIED
 ULATES THE MODIFIED SPHERICAL
 SS Y CALCULATES THE SPHERICAL
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 IBPLUSN COMPUTES INCOMPLETE
 IBQPLUSN COMPUTES INCOMPLETE
 THE AIRY FUNCTIONS AI(Z) AND
 REABIO TRANSFORMS A MATRIX TO
 ATES THE SINGULAR VALUES OF A
 E REAL EIGENVALUES (ELLIPTIC
 E REAL EIGENVALUES (ELLIPTIC
 SYM SOLVES A LINEAR TWO-POINT
 KEW SOLVES A LINEAR TWO-POINT
 SYM SOLVES A LINEAR TWO-POINT
 LAG SOLVES A LINEAR TWO-POINT

BESSEL FUNCTIONS OF THE 1ST KIND MULTIPLIED BY $\exp(-x)$; $I(K+.5)(X)*SQRT(PI/(2*X))*EXP(-X)$,
 BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER A+K ($0 <= K <= N$, $0 <= A < 1$).
 BESSEL FUNCTIONS OF ORDER A+N, N=0,....,NMAX, A>=0 AND ARGUMENT X>=0.
 BESSEL FUNCTIONS OF ORDER A+N, N=0,....,NMAX, A>=0 AND ARGUMENT X>=0, MULT
 BESSEL FUNCTIONS OF ORDER L (L = 0,....,N).
 BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,....,N).
 BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,....,N); THE RESULT IS MULTIPLIED BY E
 BESSEL FUNCTIONS OF THE 1ST KIND: $I(K+.5)(X)*SQRT(PI/(2*X))$, K=0,....,N, WHERE $I(K+.5)(X)$
 BESSEL FUNCTIONS OF THE 1ST KIND: $J(K+.5)(X)*SQRT(PI/(2*X))$, K=0,....,N, WHERE $J(K+.5)(X)$
 BESSEL FUNCTIONS OF THE 2ND KIND (ALSO CALLED MEUMANN'S FUNCTIONS) OF ORDER A AND A+1 ($0 <= A < 1$)
 BESSEL FUNCTIONS OF ORDER A+N, N=0,....,NMAX, A>=0, AND ARGUMENT X>=0.
 BESSEL FUNCTIONS OF THE 2ND KIND OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X > 0.
 BESSEL FUNCTIONS OF THE 2ND KIND ORDER ZERO AND ONE WITH ARGUMENT X; X > 0.
 BESSEL FUNCTIONS OF THE 3RD KIND MULTIPLIED BY $\exp(+x)$; $K(I+.5)(X)*SQRT(PI/(2*X))*EXP(+X)$
 BESSEL FUNCTIONS OF ORDER A AND A+1, A>=0 AND ARGUMENT X, X>0, MULTIPLIED
 BESSEL FUNCTIONS OF ORDER A AND A+1, A>=0, AND ARGUMENT X, X>0.
 BESSEL FUNCTIONS OF ORDER A+N, N=0,....,NMAX, A>=0 AND ARGUMENT X>0 MULTIP
 BESSEL FUNCTIONS OF ORDER A+N, N=0,....,NMAX, A>=0, AND ARGUMENT X>0.
 BESSEL FUNCTIONS OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X > 0.
 BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X > 0.
 BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X>0; THE RESU
 BESSEL FUNCTIONS OF THE 3RD KIND OF ORDERS ZERO AND ONE WITH ARGUMENT X, X>0; THE RESULT IS
 BESSEL FUNCTIONS OF THE 3RD KIND: $K(I+.5)(X)*SQRT(PI/(2*X))$, I=0,....,N, WHERE $K(I+.5)(X)$
 BESSEL FUNCTIONS OF THE 3RD KIND: $Y(K+.5)(X)*SQRT(PI/(2*X))$, K=0,....,N, WHERE $Y(K+.5)(X)$
 BETA-FUNCTION $I(X,P,Q)$; $0 <= X <= 1$, $P > 0$, $Q > 0$.
 BETA-FUNCTION RATIOS $I(X,P+N,Q)$ FOR $N = 0 (1) NMAX$, $0 <= X <= 1$, $P > 0$, $Q > 0$.
 BETA-FUNCTION RATIOS $I(X,P,Q+N)$ FOR $N = 0 (1) NMAX$, $0 <= X <= 1$, $P > 0$, $Q > 0$.
 BI(Z) AND THEIR DERIVATIVES.
 BIAGONAL FORM, BY PREMULTIPLYING AND POSTMULTIPLYING WITH ORTHOGONAL MATRICES.
 BIDIAGONAL MATRIX.
 BOUNDARY VALUE PROBLEM) BY MEANS OF A NON-STATIONARY 2ND ORDER ITERATIVE METHOD.
 BOUNDARY VALUE PROBLEM) BY MEANS OF A NON-STATIONARY 2ND ORDER ITERATIVE METHOD, WHICH IS
 BOUNDARY-VALUE PROBLEM FOR A FOURTH ORDER SELF-ADJOINT DIFFERENTIAL EQUATION WITH DIRICHLE
 BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER DIFFERENTIAL EQUATION BY A RITZ-GALERKIN METHOD.
 BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER SELF-ADJOINT DIFFERENTIAL EQUATION BY A RITZ-GAL
 BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER SELF-ADJOINT DIFFERENTIAL EQUATION BY A RITZ-GAL
 CARPOL TRANSFORMS THE CARTESIAN COORDINATES OF A COMPLEX NUMBER INTO POLAR COORDINATES.
 CARTESIAN COORDINATES OF A COMPLEX NUMBER INTO POLAR COORDINATES.
 CHEBSHVEV POLYNOMIAL.
 CHEBSHVEV POLYNOMIALS UP TO A CERTAIN DEGREE.
 CHEBSHVEV SERIES.
 CHEBSHVEV SERIES.
 CHEPOL EVALUATES A CHEBSHVEV POLYNOMIAL.
 CHEPOLSER EVALUATES A CHEBSHVEV SERIES.
 CHLDECBND PERFORMS THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX
 CHLDECBND PERFORMS THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX
 CHLDECINV1 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQ
 CHLDECINV2 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQ
 CHLDECSOLBND SOLVES A POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM AND PERFORMS THE TRIANGULA
 CHLDECSOL1 SOLVES A POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S S
 CHLDECSOL2 SOLVES A POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S S
 CHLDECI1 CALCULATES THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOS
 CHLDECI2 CALCULATES THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOS
 CHLDETERBND CALCULATES THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC MATRIX
 CHLDETERB1 CALCULATES THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
 CHLDETERM1 CALCULATES THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOLESK
 CHLDETERM2 CALCULATES OF THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOL
 CHLINV1 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS

35154 247
 35180 249
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 35051 187
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 35140 243
 34260 109
 34270 125
 33170 225
 33171 225
 33303 265
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 33301 261
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 34310 55
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 34312 57
 34401 61

CHLDECBD PERFORMS THE
 CHLDEC1 CALCULATES THE
 CHLDEC2 CALCULATES THE
 E TRIANGULAR DECOMPOSITION BY
 SYSTEM OF LINEAR EQUATIONS BY
 SYSTEM OF LINEAR EQUATIONS BY

TAMMAT != SCALAR PRODUCT OF A
 TAMVEC != SCALAR PRODUCT OF A
 OMCOLCST MULTIPLIES A COMPLEX
 COLCST MULTIPLIES A
 ES A CONSTANT MULTIPLIED BY A
 DUPVECCOL COPIES A
 LMCOL ADDS A CONSTANT TIMES A
 OMPLEX NUMBER TIMES A COMPLEX
 OMPLEX NUMBER TIMES A COMPLEX
 OMCOL ADDS A CONSTANT TIMES A
 ECCOL ADDS A CONSTANT TIMES A
 ULATES THE INFINITY-NORM OF A
 OL CALCULATES THE 1-NORM OF A
 TES THE SCALAR PRODUCT OF TWO
 SCLCON NORMALIZES THE
 REASCL NORMALIZES THE

CHLINV2 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS
 CHLSOLBND SOLVES A POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM, THE TRIANGULAR DECOMPOSITION
 CHLSOL1 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED
 CHLSOL2 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED
 CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX.
 CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
 CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIV
 CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIV
 CHOLESKY'S METHOD.
 CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD BE GIVEN COLUMNWISE IN A ONE-
 CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD BE GIVEN IN THE UPPER TRIANGLE
 CHSH2 FINDS A COMPLEX ROTATION MATRIX.
 COLCST MULTIPLIES A COLUMN VECTOR BY A CONSTANT.
 COLUMN VECTOR AND A COLUMN VECTOR.
 COLUMN VECTOR AND A VECTOR.
 COLUMN VECTOR BY A COMPLEX NUMBER.
 COLUMN VECTOR BY A CONSTANT.
 COLUMN VECTOR INTO A COLUMN VECTOR.
 COLUMN VECTOR INTO A VECTOR.
 COLUMN VECTOR TO A COLUMN VECTOR.
 COLUMN VECTOR TO A COMPLEX COLUMN VECTOR.
 COLUMN VECTOR TO A COMPLEX VECTOR.
 COLUMN VECTOR TO A ROW VECTOR.
 COLUMN VECTOR TO A VECTOR.
 COLUMN VECTOR.
 COLUMN VECTOR.
 COLUMN VECTORS BY DOUBLE PRECISION ARITHMETIC.
 COLUMNS OF A COMPLEX MATRIX.
 COLUMNS OF A TWO-DIMENSIONAL ARRAY.
 COMABS CALCULATES THE MODULUS OF A COMPLEX NUMBER.
 COMCOLST MULTIPLIES A COMPLEX COLUMN VECTOR BY A COMPLEX NUMBER.
 COMDIV CALCULATES THE QUOTIENT OF TWO COMPLEX NUMBERS.
 COMEIGVAL CALCULATES THE EIGENVALUES OF A MATRIX.
 COMEIG1 CALCULATES THE EIGENVALUES AND EIGENVECTORS OF A MATRIX.
 COMEUCHRM CALCULATES THE EUCLIDEAN NORM OF A COMPLEX MATRIX WITH LM LOWER COODIAGONALS.
 COMFOUSER EVALUATES A COMPLEX FOURIER SERIES WITH REAL COEFFICIENTS.
 COMFOUSER1 EVALUATES A COMPLEX FOURIER SERIES.
 COMFOUSER2 EVALUATES A COMPLEX FOURIER SERIES.
 COMKND CALCULATES THE ROOTS OF A QUADRATIC EQUATION WITH COMPLEX COEFFICIENTS.
 COMMATVEC CALCULATES THE SCALAR PRODUCT OF A COMPLEX ROW VECTOR AND A COMPLEX VECTOR.
 COMMUL CALCULATES THE PRODUCT OF TWO COMPLEX NUMBERS.
 COMPLENTARY ERROR FUNCTION (ERF) FOR A REAL ARGUMENT.
 COMPLETE PIVOTING.
 COMPLEX COEFFICIENTS.
 COMPLEX COLUMN VECTOR BY A COMPLEX NUMBER.
 COMPLEX COLUYN VECTOR TO A COMPLEX COLUMN VECTOR.
 COMPLEX COLUMN VECTOR TO A COMPLEX VECTOR.
 COMPLEX COLUMN VECTORS X AND Y BY TWO COMPLEX VECTORS CX + SY AND CY - SX.
 COMPLEX DIAGONAL TRANSFORMATION INTO A SIMILAR UNITARY UPPER-HESSBERG MATRIX WITH A REAL
 COMPLEX EIGENVALUE OF A REAL UPPER-HESSBERG MATRIX BY MEANS OF INVERSE ITERATION.
 COMPLEX EIGENVALUES OF A REAL UPPER-HESSBERG MATRIX BY MEANS OF DOUBLE QR ITERATION.
 COMPLEX EQUILIBRATED (BY EQLBRCON) MATRIX INTO THE EIGENVECTORS OF THE ORIGINAL MATRIX.
 COMPLEX FOURIER SERIES WITH REAL COEFFICIENTS.
 COMPLEX FOURIER SERIES.
 COMPLEX FOURIER SERIES.
 COMPLEX HERMITIAN MATRIX.
 COMPLEX HERMITIAN MATRIX.

HE ERROR FUNCTION (ERF) AND
 A COMBINATION OF PARTIAL AND
 OF A QUADRATIC EQUATION WITH
 COMCOLCST MULTIPLIES A
 ADDS A COMPLEX NUMBER TIMES A
 ADDS A COMPLEX NUMBER TIMES A
 FOTCOMCOL REPLACES TWO
 TRANSFORMATION FOLLOWED BY A
 CTOR CORRESPONDING TO A GIVEN
 ALQRI CALCULATES THE REAL AND
 NSFORMS THE EIGENVECTORS OF A
 COMFOUSER EVALUATES A
 COMFOUSER1 EVALUATES A
 COMFOUSER2 EVALUATES A
 LCULATES THE EIGENVALUES OF A
 NVALUES AND EIGENVECTORS OF A

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 34012 7
 34352 21
 31131 5
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 34377 25
 34376 25
 34028 9
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 34414 39
 34360 29
 34183 17
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 SOLVES A SYSTEM OF 1ST ORDER
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 SOLVES A SYSTEM OF 2ND ORDER
 SOLVES A SYSTEM OF 2ND ORDER
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 LNGFULSYMATVEC CALCULATES BY
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 DUCT OF TWO COLUMN VECTORS BY
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 BOTH VECTORS ARE CONSTANT, BY
 N A ONE-DIMENSIONAL ARRAY, BY
 SINGLE PRECISION NUMBERS TO A
 LNGADD ADDS TWO
 LNGSUB SUBTRACTS TWO
 LNGHUL MULTIPLIES TWO
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 DOUBLE PRECISION ARITHMETIC.
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 DOUBLE PRECISION NUMBERS.
 DOUBLE PRECISION NUMBERS.
 DOUBLE PRECISION NUMBERS.
 DOUBLE PRECISION PRODUCT.
 DOUBLE PRECISION QUOTIENT.
 DOUBLE PRECISION QUOTIENT.
 DOUBLE PRECISION SUM.
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 DPOIV DIVIDES TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION QUOTIENT.
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 E DELIVERS A FULL PRECISION APPROXIMATION TO E=CA 2.718...

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 33050 169
 33040 167
 33070 157
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 33033 143
 33017 147
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 33013 173
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 33131 165
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 34444 259
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FRESNEL CALCULATES THE

AN MATRIX OF AN N-DIMENSIONAL
 AN MATRIX OF AN N-DIMENSIONAL
 AN MATRIX OF AN N-DIMENSIONAL
 MINIMIZER MINIMIZES A
 MINIMIZER MINIMIZES A
 ES THE DEFINITE INTEGRAL OF A
 ES THE DEFINITE INTEGRAL OF A
 GIVEN INTERVAL) A ZERO OF A
 GIVEN INTERVAL) A ZERO OF A
 GIVEN INTERVAL) A ZERO OF A
 LINEMIN MINIMIZES A
 RNKIMIN MINIMIZES A
 FLEHIN MINIMIZES A
 PRAXIS MINIMIZES A
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 JAPLUSH CALCULATES THE BESSEL
 SS YA01 CALCULATES THE BESSEL
 YAPLUSH CALCULATES THE BESSEL
 FERENTIAL EQUATION BY A RIITZ-
 FERENTIAL EQUATION BY A RIITZ-
 BOUNDARY CONDITIONS BY A RIITZ-
 FERENTIAL EQUATION BY A RIITZ-

CULATES THE RECIPROCAL OF THE
 THE NATURAL LOGARITHM OF THE
 GAMMA CALCULATES THE
 OHGM COMPUTES THE INCOMPLETE
 SYSTEM OF LINEAR EQUATIONS BY
 S-MOULTON, ADAMS-BASHFORTH OR
 QZI COMPUTES
 QZIVAL COMPUTES

FROM THE NEWTON FORM INTO THE

HSHRMTRI TRANSFORMS A
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 AND EIGENVECTORS OF A COMPLEX
 THE EIGENVALUES OF A COMPLEX
 AND EIGENVECTORS OF A COMPLEX
 THE CODIAGONAL ELEMENTS OF A
 X EIGENVALUES OF A REAL UPPER-
 AL EIGENVALUE OF A REAL UPPER-

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 FULSYMATEC CALCULATES THE PRODUCT A * B, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANG
 FULTAMVEC CALCULATES THE PRODUCT A * B, WHERE A* IS THE TRANSPOSED OF THE MATRIX A AND B
 FUNCTION OF M VARIABLES USING FORWARD DIFFERENCES.
 FUNCTION OF N VARIABLES USING FORWARD DIFFERENCES.
 FUNCTION OF N VARIABLES, IF THE JACOBIAN IS KNOWN TO BE A BAND MATRIX.
 FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL.
 FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL, USING VALUES OF THE FUNCTION AND OF ITS DERI
 FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL.
 FUNCTION OF ONE VARIABLE OVER A FINITE OR INFINITE INTERVAL OR OVER A NUMBER OF CONSECUTIV
 FUNCTION OF ONE VARIABLE USING VALUES OF THE FUNCTION AND OF ITS DERIVATIVE.
 FUNCTION OF ONE VARIABLE.
 FUNCTION OF ONE VARIABLE.
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 FUNCTION OF SEVERAL VARIABLES.
 FUNCTION OF SEVERAL VARIABLES.
 FUNCTION OF SEVERAL VARIABLES.
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 GALERKIN METHOD.
 GALERKIN METHOD.
 GALERKIN METHOD.
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 GSSERB PERFORMS A TRIANGULAR DECOMPOSITION OF THE MATRIX OF A SYSTEM OF LINEAR EQUATIONS AN
 GSSINV CALCULATES THE INVERSE OF A MATRIX.
 GSSINVERB CALCULATES THE INVERSE OF A MATRIX AND 1-NORM, AN UPPERBOUND FOR THE ERROR IN TH
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 GSSITISOLVERB SOLVES A SYSTEM OF LINEAR EQUATIONS; THIS SOLUTION IS IMPROVED ITERATIVELY AN
 GSSNEWTON CALCULATES THE LEAST SQUARES SOLUTION OF AN OVERDETERMINED SYSTEM OF NON-LINEAR
 GSSNRI PERFORMS A TRIANGULAR DECOMPOSITION AND CALCULATES THE 1-NORM OF THE INVERSE MATRIX
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 GSSSOLVERB SOLVES A SYSTEM OF LINEAR EQUATIONS AND CALCULATES A ROUGH UPPERBOUND FOR THE RE
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 HERMITIAN MATRIX.
 HERMITIAN MATRIX.
 HERMITIAN MATRIX.
 HERMITIAN TRIDIAGONAL MATRIX WHICH IS UNITARY SIMILAR WITH A GIVEN HERMITIAN MATRIX.
 HESSENBERG MATRIX BY MEANS OF DOUBLE QR ITERATION.
 HESSENBERG MATRIX BY MEANS OF INVERSE ITERATION.

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 31050 43
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 34242 45
 34236 51
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 34254 53
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 34243 49
 34363 105
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 34371 119
 34364 105
 34190 115
 34181 115

EX EIGENVALUE OF A REAL UPPER-
A MATRIX INTO A SIMILAR UPPER-
INTO A SIMILAR UNITARY UPPER-
IGENVALUES OF A COMPLEX UPPER-
IGENVALUES OF A COMPLEX UPPER-
E EIGENVALUES OF A REAL UPPER-
EIGENVECTORS OF A REAL UPPER-

HOMSOLSVD SOLVES THE
HOMSOL SOLVES THE

T PREMULTIPLIES A MATRIX BY A
POSTMULTIPLIES A MATRIX BY A
T PREMULTIPLIES A MATRIX BY A
POSTMULTIPLIES A MATRIX BY A
T PREMULTIPLIES A MATRIX BY A
POSTMULTIPLIES A MATRIX BY A
NEAR LEAST SQUARES PROBLEM BY
LSQRTEC DELIVERS THE
A COMPLEX MATRIX BY MEANS OF
R TRIANGULAR ONE BY MEANS OF
R TRIANGULAR ONE BY MEANS OF
R TRIANGULAR ONE BY MEANS OF

ANSFORMATION CORRESPONDING TO

ANSFORMATION CORRESPONDING TO

IX FROM THE DATA GENERATED BY
IX FROM THE DATA GENERATED BY

ACFCOSH COMPUTES THE
SINH COMPUTES THE
ARCSINH COMPUTES THE INVERSE
ARCTANH COMPUTES THE INVERSE
COMPLETE BETA-FUNCTION RATIOS
THE INCOMPLETE BETA-FUNCTION
COMPLETE BETA-FUNCTION RATIOS

HESSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
HESSENBERG MATRIX BY MEANS OF WILKINSON'S TRANSFORMATION.
HESSENBERG MATRIX WITH A REAL NONNEGATIVE SUBDIAGONAL.
HESSENBERG MATRIX WITH A REAL SUBDIAGONAL.
HESSENBERG MATRIX.
HESSENBERG MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL, BY MEANS OF SINGLE QR ITERATION
HESSENBERG MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL, BY MEANS OF SINGLE QR ITERATION
HESTGL2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HESTGL3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.

HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS A * X = 0 AND X' * A = 0, WHERE "A" DENOTES A MATRI
HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS A * X = 0 AND X' * A = 0, WHERE "A" DE
HOMSOL SOLVES THE HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS A * X = 0 AND X' * A
HOMSOLSVD SOLVES THE HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS A * X = 0 AND X' * A
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A COLUMN IN A TWO-D
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A COLUMN IN A TWO-D
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A ROW IN A TWO-DIME
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A ROW IN A TWO-DIME
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN IN A ONE-DIMENSIONAL A
HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN IN A ONE-DIMENSIONAL A
HOUSEHOLDER TRIANGULARIZATION WITH COLUMN INTERCHANGES AND CALCULATES THE DIAGONAL OF THE
HOUSEHOLDER'S TRANSFORMATION FOLLOWED BY A COMPLEX DIAGONAL TRANSFORMATION INTO A SIMILAR
HOUSEHOLDER'S TRANSFORMATION.
HOUSEHOLDER'S TRANSFORMATION.
HSHCOLMAT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MAT
HSHCOLTAY POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MA
HSHCOMCOL TRANSFORMS A COMPLEX VECTOR INTO A VECTOR PROPORTIONAL TO A UNIT VECTOR.
HSHCOMHES TRANSFORMS A COMPLEX MATRIX BY MEANS OF HOUSEHOLDER'S TRANSFORMATION FOLLOWED BY
HSHCOMHES.

HSHCOMPRD PREMULTIPLIES A COMPLEX MATRIX WITH A COMPLEX HOUSEHOLDER MATRIX.
HSHDECMUL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSHHRTTRI TRANSFORMS A HERMITIAN MATRIX INTO A SIMILAR REAL SYMMETRIC TRIDIAGONAL MATRIX.
HSHHRTTRI.
HSHHRTTRIVAL DELIVERS THE MAIN DIAGONAL ELEMENTS AND THE SQUARES OF THE CODIAGONAL ELEMENT
HSHREAB10 TRANSFORMS A MATRIX TO BIAGONAL FORM, BY PREMULTIPLYING AND POSTMULTIPLYING WI
HSHREAB10.
HSHREAB10.
HSHROWMAT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MAT
HSHROWMAT POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MA
HSHVECMAT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MAT
HSHVECMAT POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MA
HSH2COL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSH2ROW2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSH2ROW3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSH3COL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSH3ROW2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
HSH3ROW3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.

HYPERBOLIC COSINE FOR A REAL ARGUMENT X.
HYPERBOLIC COSINE FOR A REAL ARGUMENT X.
HYPERBOLIC SINE FOR A REAL ARGUMENT X.
HYPERBOLIC SINE FOR A REAL ARGUMENT X.
HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
I(X,P+N,Q) FOR N = 0 (1) NMAX, 0 <= X <= 1, P > 0, Q > 0.
I(X,P,Q); 0 <= X <= 1, P > 0, Q > 0.
I(X,P,Q+N) FOR N = 0 (1) NMAX, 0 <= X <= 1, P > 0, Q > 0.

34191 115
34170 103
34366 107
34372 121
34373 121

34180 115
34186 115
34604 267
34603 267
34284 71
34285 71
34285 71
34285 71
34284 71
31071 269
31074 269
31072 269
31075 269
31070 269
31073 269
34135 65
34134 63
34366 107
34143 101
34140 101
31071 269
31074 269
34355 23
34366 107
34367 107
34356 23
34602 267
34363 105
34365 105
34364 105
34260 109
34261 109
34262 109
31072 269
31075 269
31070 269
31073 269
34605 267
34608 267
34607 267
34606 267
34610 267
34609 267
35112 181
35115 181
35111 181
35114 181
35113 181
35116 181
35051 187
35050 187
35052 187

INITMAD
INITSYMD
INITMAT
INISYMRH
INIVEC

INITIALIZES A (CO)DIAGONAL OF A MATRIX.
INITIALIZES A (CO)DIAGONAL OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE
INITIALIZES A MATRIX WITH A CONSTANT.
INITIALIZES A ROW OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE
INITIALIZES A VECTOR WITH A CONSTANT.
INIVEC INITIALIZES A VECTOR WITH A CONSTANT.
INICAP DELIVERS THE INTEGER CAPACITY.
INICHS COMPUTES THE INDEFINITE INTEGRAL OF A GIVEN CHEBYSHEV SERIES.
INTEGR AND POWER IS THE POSITIVE (SINGLE-LENGTH) EXPONENT.
INTEGER CAPACITY.
INTEGERS.
INTEGERS.
INTEGERS.
INTEGERS.
INTEGERS.
INTEGRAL .
INTEGRAL CALCULATES THE DEFINITE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE OR I
INTEGRAL CIX(X).
INTEGRAL CIX(X).
INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL.
INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE OR INFINITE INTERVAL OR OVER A NUMBER
INTEGRAL OF A FUNCTION OF TWO VARIABLES OVER A TRIANGULAR DOMAIN.
INTEGRAL OF A GIVEN CHEBYSHEV SERIES.
INTEGRAL OF A GIVEN CHEBYSHEV SERIES.
INTEGRALS S1(X) AND THE COSINE INTEGRAL C1(X).
INTEGRALS E1(X,X) = THE INTEGRAL FROM 1 TO INFINITY OF EXP(-X + T)/ T**N DT.
INTERCHANGES A ROW AND A COLUMN OF A MATRIX.
INTERCHANGES A ROW AND A COLUMN OF AN UPPERTRIANGULAR MATRIX, WHICH IS STORED COLUMNWISE I
INTERCHANGES TWO COLUMNS OF A MATRIX.
INTERCHANGES TWO COLUMNS OF AN UPPERTRIANGULAR MATRIX, WHICH IS STORED COLUMNWISE IN A ONE
INTERCHANGES TWO ROWS OF MATRIX.
INTERCHANGES TWO VECTORS GIVEN IN ARRAY ALL(U) AND ARRAY A(SHIFT + L I SHIFT + U1).
INTERPOLATION POINTS AND CORRESPONDING FUNCTION VALUES.
INV CALCULATES THE INVERSE OF A MATRIX THAT HAS BEEN TRIANGULARLY DECOMPOSED BY DEC.
INVERSE ERROR FUNCTION CALCULATES THE INVERSE ERROR FUNCTION Y = INVERFX).
INVERSE HYPERBOLIC COSINE FOR A REAL ARGUMENT X.
INVERSE HYPERBOLIC SINE FOR A REAL ARGUMENT X.
INVERSE HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
INVERSE ITERATION.
INVERSE ITERATION.
INVERSE ITERATION.
INVERSE ITERATION.
INVERSE ITERATION.
INVERSE ITERATION.
INVERSE MATRIX.
INVERSE OF A MATRIX AND 1-NORM, AN UPPERBOUND FOR THE ERROR IN THE INVERSE MATRIX IS ALSO
INVERSE OF A MATRIX THAT HAS BEEN TRIANGULARLY DECOMPOSED BY DEC.
INVERSE OF A MATRIX THAT HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELM OR GSSERB.THE 1-NORM J
INVERSE OF A MATRIX WHOSE ORDER IS SMALL RELATIVE TO THE NUMBER OF BINARY DIGITS IN THE NU
INVERSE OF A MATRIX WHOSE TRIANGULARLY DECOMPOSED FORM IS OELIVERED BY GSSELM.
INVERSE OF A MATRIX.
INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEF
INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEF
INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLD
INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLD
INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFF
INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFF
INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC1 OR SYMD
INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC2 OR SYMD

WHERE U IS A LONG NONNEGATIVE
INICAP DELIVERS THE
S THE SUM OF LONG NONNEGATIVE
DIFFERENCE OF LONG NONNEGATIVE
E PRODUCT OF LONG NONNEGATIVE
REMAINDER OF LONG NONNEGATIVE
EI CALCULATES THE EXPONENTIAL

INTEGRAL S1(X) AND THE COSINE
QUADRAT COMPUTES THE DEFINITE
EGRAL CALCULATES THE DEFINITE
TRICUB COMPUTES THE DEFINITE
NICHOS COMPUTES THE INDEFINITE
SINDOSINT CALCULATES THE SINE
RESHEL CALCULATES THE FRESHEL
TES A SEQUENCE OF EXPONENTIAL
ICHRWCOL
ICHSQVEVC
ICHCOL
ICHSQ
ICHRM
ICHVEC

WTON POLYNOMIAL THROUGH GIVEN

ARCCOSH COMPUTES THE
ARCSINH COMPUTES THE
ARCTANH COMPUTES THE
RIDIAGONAL MATRIX BY MEANS OF
AND EIGENVECTORS BY MEANS OF
AND EIGENVECTORS BY MEANS OF
HESSENBERG MATRIX BY MEANS OF
HESSENBERG MATRIX BY MEANS OF
CALCULATES THE 1-NORM OF THE
GSSINVERB CALCULATES THE
INV CALCULATES THE
INV1 CALCULATES THE
DECINV1 CALCULATES THE
CALCULATES THE 1-NORM OF THE
GSSINV1 CALCULATES THE
CHLOECINV2 CALCULATES THE
CHLDECINV1 CALCULATES THE
CHLINV2 CALCULATES THE
CHLINV1 CALCULATES THE
SYMDECINV2 CALCULATES THE
SYMDECINV1 CALCULATES THE
SYMINV1 CALCULATES THE
SYMENV2 CALCULATES THE

31012 1
31013 1
31011 1
31014 1
31010 1
31010 1
30005 275
31248 205
31204 201
30005 275
31200 201
31201 201
31202 201
31203 201
35080 183
32051 135
35084 185
32070 133
32051 135
32075 257
31248 205
35084 185
35027 227
35006 183
34033 11
34034 11
34031 11
34035 11
34032 11
34030 11
36010 195
34053 51
35023 227
35115 181
35114 181
35116 181
34152 111
34156 113
34154 113
34181 115
34191 115
34252 45
34244 51
34053 51
34235 51
34302 51
34240 45
34236 51
34402 61
34403 61
34400 61
34401 61
34711 283
34709 283
34708 281

GAMMA CALCULATES THE NATURAL LOGARITHM OF THE GAMMA FUNCTION FOR POSITIVE ARGUMENTS. 34412 39

HPUTES U**POWER, WHERE U IS A LONG NONNEGATIVE INTEGER AND POWER IS THE POSITIVE (SINGLE-LENGTH) EXPONENT. 34410 39

LNQINTADD COMPUTES THE SUM OF LONG NONNEGATIVE INTEGERS. 35062 187

CT COMPUTES THE DIFFERENCE OF LONG NONNEGATIVE INTEGERS. 35062 187

TMULT COMPUTES THE PRODUCT OF LONG NONNEGATIVE INTEGERS. 31204 201

HE QUOTIENT WITH REMAINDER OF LONG NONNEGATIVE INTEGERS. 31200 201

LSQDGLN CALCULATES THE DIAGONAL ELEMENTS OF THE INVERSE OF M*M, WHERE M IS THE COEFFICIENT MATRIX OF A LI 31201 201

LSQIN CALCULATES THE INVERSE OF THE MATRIX S'S, WHERE S IS THE COEFFICIENT MATRIX OF A LI 31202 201

LSQRTDEC DELIVERS THE HOUSEHOLDER TRIANGULARIZATION WITH COLUMN INTERCHANGES OF THE MATRIX 31203 201

LSQRTDECSOL SOLVES A LINEAR LEAST SQUARES PROBLEM BY HOUSEHOLDER TRIANGULARIZATION WITH C 34132 63

LSQSOL SOLVES A LINEAR LEAST SQUARES PROBLEM IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED 34134 63

LUPERZORTPOL CALCULATES A NUMBER OF ADJACENT UPPER OR LOWER ZEROS OF AN ORTHOGONAL POLYNOM 34135 65

MARQUARDT CALCULATES THE LEAST SQUARES SOLUTION OF AN OVERDETERMINED SYSTEM OF NON-LINEAR 34131 65

MATMAT I= SCALAR PRODUCT OF A ROW VECTOR AND A COLUMN VECTOR. 31363 211

MATRIX INTO ANOTHER MATRIX. 34440 219

OMPRG PREMULTIPLIES A COMPLEX MATRIX WITH A COMPLEX HOUSEHOLDER MATRIX. 34013 7

INITMAT INITIALIZES A MATRIX WITH A CONSTANT. 31035 3

ULATES THE INFINITY-NORM OF A MATRIX. 34356 23

AT CALCULATES THE 1-NORM OF A MATRIX. 31011 1

A ROW VECTOR TO A ROW VECTOR. 31064 241

MININ MINIMIZES A FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL. 31068 241

MININDER MINIMIZES A FUNCTION OF SEVERAL VARIABLES. 34015 7

LINEMIN MINIMIZES A FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL. 34011 7

ANKMIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES. 34025 9

FLEMIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES. 30001 275

PRAXIS MINIMIZES A FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL. 34433 235

BESS I1 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE. 34433 235

BESS I0 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO. 34435 237

BESS I0 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE. 34210 139

BESS IAPLUSN CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER L (L = 0,.....N). 34214 19

BESS I CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER L (L = 0,.....N). 34215 19

BESS I CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER L (L = 0,.....N). 34432 239

BESS KAD01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 34433 235

BESS KAPLUSN CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 34435 237

BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 36022 197

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35171 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35176 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35170 255

BESS KAD01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35175 255

BESS KAPLUSN CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35190 251

BESS KAPLUSN CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35193 251

BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35172 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35177 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35194 251

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35191 251

BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35192 251

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35174 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35179 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35178 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35173 255

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35154 247

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35152 247

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35155 247

BESS K01 CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTION OF THE 1ST KIND: IK(K+.5)X)*SQRT(PI/(2*X)), K=0,.....N 35153 247

COMABS CALCULATES THE
 MULCOL STORES A CONSTANT
 MULROW STORES A CONSTANT
 MULVEC STORES A CONSTANT
 COLCST
 COMCOLCST
 COMROWCST
 ROWCST
 LNHUL
 DPHUL
 LEM) BY MEANS OF A 3RD ORDER
 LOG GAMMA CALCULATES THE
 OF THE 2ND KIND (ALSO CALLED
 NSFORMS A POLYNOMIAL FROM THE
 QUANEHND SOLVES A SYSTEM OF
 QUANEHND1 SOLVES A SYSTEM OF
 F AN OVERDETERMINED SYSTEM OF
 F AN OVERDETERMINED SYSTEM OF
 MODIFIED TAYLOR SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLE
 MODULUS OF A COMPLEX NUMBER.
 MULCOL STORES A CONSTANT MULTIPLIED BY A COLUMN VECTOR INTO A COLUMN VECTOR.
 MULROW STORES A CONSTANT MULTIPLIED BY A ROW VECTOR INTO A ROW VECTOR.
 MULTIPLIED BY A COLUMN VECTOR INTO A COLUMN VECTOR.
 MULTIPLIED BY A ROW VECTOR INTO A ROW VECTOR.
 MULTIPLIED BY A VECTOR INTO A VECTOR.
 MULTIPLIES A COLUMN VECTOR BY A CONSTANT.
 MULTIPLIES A COMPLEX COLUMN VECTOR BY A COMPLEX NUMBER.
 MULTIPLIES A COMPLEX ROW VECTOR BY A COMPLEX NUMBER.
 MULTIPLIES A ROW VECTOR BY A CONSTANT.
 MULTIPLIES TWO DOUBLE PRECISION NUMBERS.
 MULTIPLIES TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION PRODUCT.
 MULTIPLIER METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS.
 MULTISTEP SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY
 NATURAL LOGARITHM OF THE GAMMA FUNCTION FOR POSITIVE ARGUMENTS.
 NEUMANN'S FUNCTIONS) OF ORDER A AND A+1 (A>=0) AND ARGUMENT X>0.
 NEWRN TRANSFORMS A POLYNOMIAL FROM THE NEWTON FORM INTO THE GRUNERT FORM.
 NEWTON CALCULATES THE COEFFICIENTS OF THE NEWTON POLYNOMIAL THROUGH GIVEN INTERPOLATION PO
 NEWTON FORM INTO THE GRUNERT FORM.
 NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN (BEING A BAND MATRIX) IS GIVEN.
 NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN IS A BAND MATRIX.
 NON-LINEAR EQUATIONS WITH MARQUARDT'S METHOD.
 NON-LINEAR EQUATIONS WITH THE GAUSS-NEWTON METHOD.
 NONEXP BESS I CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,
 NONEXP BESS I0 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER A+N,
 NONEXP BESS I1 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO; THE R
 NONEXP BESS K CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE; THE R
 NONEXP BESS K0 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER L (L = 0,
 NONEXP BESS K01 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A+N,
 NONEXP BESS K011 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A AND A
 NONEXP ENX COMPUTES A SEQUENCE OF INTEGRALS EXP(X) * EIN(X).
 NONEXP SPHER BESS I CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 1ST KIND MUL
 NONEXP SPHER BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 3RD KIND MUL
 NONEXPERFC COMPUTES ERFC(X) + EXP(X*X).
 NORDERPOL EVALUATES THE FIRST K NORMALIZED DERIVATIVES OF A POLYNOMIAL (I.E. J-TH DERIVAT
 NORM OF A COLUMN VECTOR.
 NORM OF A COLUMN VECTOR.
 NORM OF A COMPLEX MATRIX WITH LM LOWER COTRIDIAGONALS.
 NORM OF A MATRIX.
 NORM OF A MATRIX.
 NORM OF A ROW VECTOR.
 NORM OF A ROW VECTOR.
 NORM OF A VECTOR.
 NORM OF A VECTOR.
 NORM OF THE INVERSE MATRIX.
 NORM OF THE INVERSE OF A MATRIX WHOSE TRIANGULARLY DECOMPOSED FORM IS DELIVERED BY GSSELM.
 NORM, AN UPPERBOUND FOR THE ERROR IN THE INVERSE MATRIX IS ALSO GIVEN.
 NORMALIZED DERIVATIVES OF A POLYNOMIAL (I.E. J-TH DERIVATIVE/(J FACTORIAL)), J=0,1,....,K
 NORMALIZES REAL AND COMPLEX EIGENVECTORS.
 NORMALIZES THE COLUMNS OF A COMPLEX MATRIX.
 NORMALIZES THE COLUMNS OF A TWO-DIMENSIONAL ARRAY.
 ONENRMCOL CALCULATES THE 1-NORM OF A COLUMN VECTOR.
 ONENRMINV CALCULATES THE 1-NORM OF THE INVERSE OF A MATRIX WHOSE TRIANGULARLY DECOMPOSED F

33040 167
 34340 35
 31022 5
 31021 5
 31022 5
 31021 5
 31020 5
 31131 5
 34352 21
 34353 21
 31132 5
 31107 271
 31103 271
 33191 223
 33080 151
 31020 5
 35062 187
 35181 249
 31050 43
 36010 195
 31050 43
 34430 217
 34431 217
 34440 219
 34441 219
 35177 255
 35193 251
 35175 255
 35176 255
 35179 255
 35195 251
 35194 251
 35178 255
 35087 183
 35154 247
 35155 247
 35022 227
 31242 245
 31063 241
 31067 241
 34359 31
 31064 241
 31068 241
 31062 241
 31066 241
 31061 241
 31065 241
 34252 45
 34240 45
 34244 51
 31242 245
 34193 29
 34360 29
 34183 17
 31067 241
 34240 45

31068 241
 31066 241
 31065 241
 35161 253
 35160 253
 35162 253
 35164 253
 35163 253
 31362 211
 31363 211
 31364 211
 34281 67
 34280 67
 34440 219
 34441 219
 30008 275
 34444 259
 34231 45
 34300 45
 34444 259
 34367 107
 30006 273
 34322 79
 34300 45
 34231 45
 31040 245
 34344 35
 31242 245
 31050 43
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 31073 269

ONENRMHAT CALCULATES THE 1-NORM OF A MATRIX.
 ONENRMROW CALCULATES THE 1-NORM OF A ROW VECTOR.
 ONENRHEC CALCULATES THE 1-NORM OF A VECTOR.
 ORDINARY BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE.
 ORDINARY BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO.
 ORDINARY BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,.....N).
 ORDINARY BESSEL FUNCTIONS OF THE 2ND KIND OF ORDER L (L = 0,.....N) WITH ARGUMENT X, X > 0
 ORDINARY BESSEL FUNCTIONS OF THE 2ND KIND OF ORDER ZERO AND ONE WITH ARGUMENT X; X > 0.
 ORTHOGONAL POLYNOMIAL.
 ORTHOGONAL POLYNOMIAL.
 ORTHOGONAL POLYNOMIAL.
 OVERDETERMINED SYSTEM OF LINEAR EQUATIONS.
 OVERDETERMINED SYSTEM OF LINEAR EQUATIONS, MULTIPLYING THE RIGHT-HAND SIDE BY THE PSEUDO-INVERSE.
 OVERDETERMINED SYSTEM OF NON-LINEAR EQUATIONS WITH MARQUARDT'S METHOD.
 OVERDETERMINED SYSTEM OF NON-LINEAR EQUATIONS WITH THE GAUSS-NEWTON METHOD.
 OVERFLOW TESTS WHETHER A VALUE IS AN OVERFLOW VALUE.
 PARAMETERS IN A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS; THE UNKNOWN VARIABLES MAY APPEAR IN A LINEAR AND COMPLETE PIVOTING.
 PARAMETERS IN A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS; THE UNKNOWN VARIABLES MAY APPEAR IN A LINEAR AND COMPLETE PIVOTING.
 PEIDE ESTIMATES UNKNOWN PARAMETERS IN A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS; THE UNKNOWN VARIABLES MAY APPEAR IN A LINEAR AND COMPLETE PIVOTING.
 PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO HSHCOMHES.
 PI DELIVERS A FULL PRECISION APPROXIMATION TO PI=CA 3.1415926535897932384626433832795028841971693993751058209749445923078164062862089986280348253421170679821480865132823066470938446095505220517152802499731028855866036826601666292786685875646017162776852911646527987272817208869756611616527382928675394171777237917067283155618167450944818752464656968242866787766887639942427067559152352249149716260323648761622967396374848663093854436788670067349690736
 PIVOTING IF THE COEFFICIENT MATRIX IS IN BAND FORM AND IS STORED ROMWISE IN A ONE-DIMENSIONAL ARRAY.
 PIVOTING.
 POL EVALUATES A POLYNOMIAL.
 POLAR COORDINATES.
 POLYNOMIAL (I.E. J-TH DERIVATIVE/(J FACTORIAL)), J=0,1,.....K <= DEGREE.
 POLYNOMIAL FROM THE NEWTON FORM INTO THE GRUNERT FORM.
 POLYNOMIAL THAT APPROXIMATES A FUNCTION, GIVEN FOR DISCRETE ARGUMENTS, SUCH THAT THE INFIMUM OF THE SQUARE OF THE RESIDUAL IS MINIMIZED.
 POLYNOMIAL THROUGH GIVEN INTERPOLATION POINTS AND CORRESPONDING FUNCTION VALUES.
 POLYNOMIAL WITH REAL COEFFICIENTS.
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 POLYNOMIALS UP TO A CERTAIN DEGREE.
 POLZEROS CALCULATES ALL ZEROS OF A POLYNOMIAL WITH REAL COEFFICIENTS.
 POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
 POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
 POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM AND PERFORMS THE TRIANGULAR DECOMPOSITION BY CHOLESKY'S METHOD.
 POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX IS GIVEN IN A ONE-DIMENSIONAL ARRAY.
 POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX IS GIVEN IN A ONE-DIMENSIONAL ARRAY.
 POSITIVE DEFINITE SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMENSIONAL ARRAY.
 POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDEC1 OR CHLDEC2.
 POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDEC1 OR CHLDEC2.
 POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN IN A TWO-DIMENSIONAL ARRAY.
 POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE INFIMUM OF THE SQUARE OF THE RESIDUAL IS MINIMIZED.
 POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE INFIMUM OF THE SQUARE OF THE RESIDUAL IS MINIMIZED.
 POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING

BESS J1 CALCULATES THE BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE.
 BESS J0 CALCULATES THE BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO.
 BESS Y CALCULATES THE BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE.
 BESS Y0 CALCULATES THE BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO.
 GL CALCULATES ALL ZEROS OF AN ORTHOGONAL POLYNOMIAL.
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KWD CALCULATES THE ROOTS OF A
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RECIP GAMMA CALCULATES THE
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LATES THE SCALAR PRODUCT OF A
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QUADRATIC EQUATION WITH COMPLEX COEFFICIENTS.
 QUANEHND SOLVES A SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN (BEING A BAND MAT
 QUAREHND1 SOLVES A SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN IS A BAND MATRIX.
 QUOTIENT OF TWO COMPLEX NUMBERS.
 QZI COMPUTES GENERALIZED EIGENVALUES AND EIGENVECTORS BY MEANS OF QZ-ITERATION.
 QZIVAL COMPUTES GENERALIZED EIGENVALUES BY MEANS OF QZ-ITERATION.
 RANK-1 MATRIX TO A SYMMETRIC MATRIX.
 RANK-2 MATRIX TO A SYMMETRIC MATRIX.
 RANK-2 MATRIX TO A SYMMETRIC MATRIX.
 REAEIGVAL CALCULATES THE EIGENVALUES OF A MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL.
 REAEIG1 CALCULATES THE EIGENVECTORS AND EIGENVALUES OF A MATRIX, PROVIDED THAT THEY ARE AL
 REAEIG3 CALCULATES THE EIGENVECTORS AND EIGENVALUES OF A MATRIX, PROVIDED THAT THEY ARE AL
 REAQR1 CALCULATES ALL EIGENVALUES AND EIGENVECTORS OF A REAL UPPER-HESSSENBERG MATRIX, PROV
 REASCL NORMALIZES THE COLUMNS OF A TWO-DIMENSIONAL ARRAY.
 REAVALQRI CALCULATES THE EIGENVALUES OF A REAL UPPER-HESSSENBERG MATRIX, PROVIDED THAT ALL
 REAVECHES CALCULATES AN EIGENVECTOR CORRESPONDING TO A GIVEN REAL EIGENVALUE OF A REAL UP
 RECIP GAMMA CALCULATES THE RECIPROCAL OF THE GAMMA FUNCTION FOR ARGUMENTS IN THE RANGE [.5
 RECIPROCAL OF THE GAMMA FUNCTION FOR ARGUMENTS IN THE RANGE [.5,1.5]; MOREOVER ODD AND EVE
 REMAINDER OF LONG NONNEGATIVE INTEGERS.
 REPRESENTABLE REAL NUMBER.
 REPRESENTABLE REAL NUMBER.
 RESIDUAL VECTOR A * B + X * C, WHERE A IS A GIVEN MATRIX, B AND C ARE VECTORS AND X IS A S
 RESIDUAL VECTOR A * B + X * C, WHERE A IS A GIVEN MATRIX, B AND C ARE VECTORS AND X IS A S
 RESIDUAL VECTOR A * B + X * C, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORE
 RESIDUAL VECTOR A * B + X * C, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORE
 RESVEC CALCULATES THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A GIVEN MATRIX, B AND C AR
 RICHARDSON SOLVES A SYSTEM OF LINEAR EQUATIONS WITH POSITIVE REAL EIGENVALUES (ELLIPTIC B
 RICHARDSON'S METHOD.
 RITZ-GALERKIN METHOD.
 RITZ-GALERKIN METHOD.
 RITZ-GALERKIN METHOD.
 RITZ-GALERKIN METHOD: THE COEFFICIENT OF Y" IS SUPPOSED TO BE UNITY.
 RKE SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS
 RK1 SOLVES A SINGLE 1ST ORDER DIFFERENTIAL EQUATION BY MEANS OF A 5TH ORDER RUNGE-KUTTA ME
 RK2 INTEGRATES A SINGLE 2ND ORDER DIFFERENTIAL EQUATION (INITIAL VALUE PROBLEM) BY MEANS
 RK2N SOLVES A SYSTEM OF 2ND ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEAN
 RK3 SOLVES A SINGLE 2ND ORDER DIFFERENTIAL EQUATION (INITIAL VALUE PROBLEM) BY MEANS OF
 RK3N SOLVES A SYSTEM OF 2ND ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEAN
 RK4A SOLVES A SINGLE 1ST ORDER DIFFERENTIAL EQUATION BY MEANS OF A 5TH ORDER RUNGE-KUTTA M
 RK4NA SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEA
 RK5NA SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEA
 RNK1MIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES.
 RNK1UPD ADDS A RANK-1 MATRIX TO A SYMMETRIC MATRIX.
 ROOTS OF A QUADRATIC EQUATION WITH COMPLEX COEFFICIENTS.
 ROTATION MATRIX.
 ROTCOL REPLACES TWO COLUMN VECTORS X AND Y BY TWO VECTORS CX + SY AND CY - SX.
 ROTCOMCOL REPLACES TWO COMPLEX COLUMN VECTORS X AND Y BY TWO COMPLEX VECTORS CX + SY AND C
 ROTCOMROW REPLACES TWO COMPLEX ROW VECTORS X AND Y BY TWO COMPLEX VECTORS CX + SY AND CY -
 ROTROW REPLACES TWO ROW VECTORS X AND Y BY TWO VECTORS CX + SY AND CY - SX.
 ROW OF A VECTOR AND A COLUMN VECTOR BY DOUBLE PRECISION ARITHMETIC.
 ROW VECTOR AND A COLUMN VECTOR.
 ROW VECTOR AND A COMPLEX VECTOR.
 ROW VECTOR AND A ROW VECTOR.
 ROW VECTOR AND A VECTOR.
 ROW VECTOR BY A COMPLEX NUMBER.

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 34430 217
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 SUBTRACTS TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION DIFFERENCE.
 SUM OF LONG NONNEGATIVE INTEGERS.
 SUMMATION OF AN INFINITE SERIES WITH POSITIVE MONOTONICALLY DECREASING TERMS USING THE VAN
 SUMPOSSERIES PERFORMS THE SUMMATION OF AN INFINITE SERIES.
 SYMDECSOL1 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITH
 SYMDECSOL2 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITH
 SYMDECSOL2 SOLVES A SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITH
 SYMDECSOL2 CALCULATES THE SYMMETRIC DECOMPOSITION OF A SYMMETRIC MATRIX WHOSE UPPER TRIANGLE
 SYMDETERM1 CALCULATES THE DETERMINANT OF A SYMMETRIC MATRIX, THE SYMMETRIC DECOMPOSITION B
 SYMDETERM2 CALCULATES THE DETERMINANT A SYMMETRIC MATRIX, THE SYMMETRIC DECOMPOSITION BEIN
 SYMDETV1 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FO
 SYMDETV2 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FO
 SYMMAIVEC := SCALAR PRODUCT OF A VECTOR AND A ROW OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANG
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 SYMMETRIC BAND MATRIX.
 SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A
 SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A
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 SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX SHOULD BE GIVEN IN TH
 SYMMETRIC DECOMPOSITION OF A SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN COLUMNWISE IN
 SYMMETRIC DECOMPOSITION OF A SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMEN
 SYMMETRIC LINEAR SYSTEM AND PERFORMS THE TRIANGULAR DECOMPOSITION BY CHOLESKY'S METHOD.
 SYMMETRIC LINEAR SYSTEM, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX
 SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX
 SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX GIVEN COLUMNWISE
 SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX GIVEN COLUMNWISE
 SYMMETRIC MATRIX BY MEANS OF QR ITERATION.
 SYMMETRIC MATRIX BY MEANS OF QR ITERATION.
 SYMMETRIC MATRIX BY MEANS OF QR ITERATION.
 SYMMETRIC MATRIX INTO A SIMILAR TRIANGULAR ONE BY MEANS OF HOUSEHOLDER'S TRANSFORMATION.
 SYMMETRIC MATRIX INTO A SIMILAR TRIANGULAR ONE BY MEANS OF HOUSEHOLDER'S TRANSFORMATION.
 SYMMETRIC MATRIX USING LINEAR INTERPOLATION OF A FUNCTION DERIVED FROM A STURM SEQUENCE.
 SYMMETRIC MATRIX USING LINEAR INTERPOLATION OF A FUNCTION DERIVED FROM A STURM SEQUENCE.
 SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDECSOL1.
 SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDECSOL2.
 SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN COLUMNWISE IN A ONE-DIMENSIONAL A
 SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN IN A TWO-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN COLUMNWISE IN A ONE-DIMENSIONAL
 SYMMETRIC MATRIX, THE SYMMETRIC DECOMPOSITION BEING GIVEN IN A TWO-DIMENSIONAL ARRAY.

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 2 CALCULATES THE INVERSE OF A
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 L1 SOLVES A POSITIVE DEFINITE
 SYMDECSOL2 SOLVES A
 SYMDECSOL1 SOLVES A
 AD SOLVES A POSITIVE DEFINITE
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 CONSECUTIVE, EIGENVALUES OF A
 LGULATES THE EIGENVALUES OF A
 NVALUES AND EIGENVECTORS OF A
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 AN MATRIX INTO A SIMILAR REAL
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 GSSOLSERB SOLVES A
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 ELSOLTRI SOLVES A TRIAGONAL
 OLVES A SYMMETRIC TRIAGONAL
 GSSITISOL SOLVES A
 A POSITIVE DEFINITE SYMMETRIC
 A POSITIVE DEFINITE SYMMETRIC
 DECSOLBND SOLVES A
 SYMDECSOL2 SOLVES A SYMMETRIC
 SYMDECSOL1 SOLVES A SYMMETRIC
 A POSITIVE DEFINITE SYMMETRIC
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 CHLSOL2 SOLVES A
 SYMSOL1 SOLVES A
 SYMSOL2 SOLVES A
 HOMSOL SOLVES THE HOMOGENEOUS
 SOLTRI SOLVES A TRIAGONAL
 OLTRIPIV SOLVES A TRIAGONAL
 SOL SOLVES THE
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 ITISOL SOLVES A
 ITISOLR3 SOLVES A
 HE ERROR IN THE SOLUTION OF A
 DECSOL SOLVES A
 RICHARDSON SOLVES A
 ELLIMINATION SOLVES A
 GSSOL SOLVES A
 AND SOLVES AN OVERDETERMINED
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 GSSITISOLSERB SOLVES A
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 SOLBND SOLVES A

SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC1 OR SYMDECSOL1.
 SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC2 OR SYMDECSOL2.
 SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MAT
 SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MAT
 SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE
 SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE
 SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY THE METHOD OF CONJUGATE GRADIENTS.
 SYMMETRIC TRIAGONAL MATRIX BY MEANS OF INVERSE ITERATION.
 SYMMETRIC TRIAGONAL MATRIX BY MEANS OF LINEAR INTERPOLATION USING A STURM SEQUENCE.
 SYMMETRIC TRIAGONAL MATRIX BY MEANS OF QR ITERATION.
 SYMMETRIC TRIAGONAL MATRIX BY MEANS OF QR ITERATION.
 SYMMETRIC TRIAGONAL MATRIX.
 SYMMETRIC TRIAGONAL MATRIX.
 SYMMETRIC TRIAGONAL SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIAGONAL DECOMPOSITIO
 SYMMETRIC TRIAGONAL SYSTEM OF LINEAR EQUATIONS, THE TRIANGULAR DECOMPOSITION BEING GIVEN
 SYMRESVEC CALCULATES THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A SYMMETRIC MATRIX, WHO
 SYMSOL1 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED
 SYMSOL2 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED
 SYSTEM OF LINEAR EQUATIONS A * X = 0 AND X' * A = 0, WHERE "A" DENOTES A MATRIX AND "X" A
 SYSTEM OF LINEAR EQUATIONS AND CALCULATES A ROUGH UPPERBOUND FOR THE RELATIVE ERROR IN THE
 SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING
 SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING
 SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITHOUT PIVOTING.
 SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION.
 SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD
 SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD
 SYSTEM OF LINEAR EQUATIONS BY GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING IF THE COEFFICIENT
 SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT
 SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT
 SYSTEM OF LINEAR EQUATIONS BY THE METHOD OF CONJUGATE GRADIENTS.
 SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY CHLDEC1 OR CHL
 SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY CHLDEC2 OR CHL
 SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY SYMDEC1 OR SYM
 SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY SYMDEC2 OR SYM
 SYSTEM OF LINEAR EQUATIONS OF EQUATIONS A * X = 0 AND X' * A = 0, WHERE "A" DENOTES A MATR
 SYSTEM OF LINEAR EQUATIONS THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 SYSTEM OF LINEAR EQUATIONS THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY DEC.
 SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELN OR GSSE
 SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELN OR GSSE
 SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX IS TRIANGULARLY DECOMPOSED BY GSSNRI; THIS SOLUTI
 SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX IS TRIANGULARLY DECOMPOSED BY GSSELN.
 SYSTEM OF LINEAR EQUATIONS WHOSE ORDER IS SMALL RELATIVE TO THE NUMBER OF BINARY DIGITS IN
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 SYSTEM OF LINEAR EQUATIONS WITH POSITIVE REAL EIGENVALUES (ELLIPTIC BOUNDARY VALUE PROBLE
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 SYSTEM OF LINEAR EQUATIONS, MULTIPLYING THE RIGHT-HAND SIDE BY THE PSEUDO-INVERSE OF THE G
 SYSTEM OF LINEAR EQUATIONS, THE MATRIX BEING DECOMPOSED BY DECSND.

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 34161 111
 34420 91
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 31504 15
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 34704 281
 34284 71
 34243 49
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OLVES A SYMMETRIC TRIAGONAL
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 SOLUTION OF AN OVERDETERMINED
 INDEX SOLVES AN AUTONOMOUS

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 TANH COMPUTES THE HYPERBOLIC
 MPUTES THE INVERSE HYPERBOLIC

ST, 2ND OR 3RD ORDER ONE-STEP
 BY MEANS OF A VARIABLE ORDER
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N A VECTOR) CORRESPONDING TO
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 TFMPREVEC IN COMBINATION WITH

ANSFORMATION CORRESPONDING TO
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 BAKREAHES2 PERFORMS THE BACK
 BAKLBR PERFORMS THE BACK
 BAKCOMHES PERFORMS THE BACK
 BAKHMTRI PERFORMS THE BACK
 BAKSYMTRI PERFORMS THE BACK
 BAKSYMTRIZ PERFORMS THE BACK
 RIX BY MEANS OF HOUSEHOLDER'S
 OLOWED BY A COMPLEX DIAGONAL
 EANS OF A DIAGONAL SIMLARIY
 ONE BY MEANS OF HOUSEHOLDER'S
 ONE BY MEANS OF HOUSEHOLDER'S
 ATRIX BY MEANS OF WILKINSON'S
 HSHCOMHES
 HSHCOMCOL
 HSHRMTRI
 TFHREAHES
 HSHREABID
 NEWGRN
 CAKPOL
 GSSNRI PERFORMS A
 DECSYMIKI PERFORMS A
 DECTRI PERFORMS A
 DECTRIIV PERFORMS A
 GSSLEH PERFORMS A
 UEC PERFORMS A

SYSTEM OF LINEAR EQUATIONS, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN (BEING A BAND MATRIX) IS GIVEN.
 SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN IS A BAND MATRIX.
 SYSTEM OF NON-LINEAR EQUATIONS WITH MARQUARDT'S METHOD.
 SYSTEM OF NON-LINEAR EQUATIONS WITH THE GAUSS-NEWTON METHOD.
 SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF THE IMPLI
 TAMMAT := SCALAR PRODUCT OF A COLUMN VECTOR AND A COLUMN VECTOR.
 TANVEC := SCALAR PRODUCT OF A COLUMN VECTOR AND A VECTOR.
 TAN COMPUTES THE TANGENT FOR A REAL ARGUMENT X.
 TANGENT FOR A REAL ARGUMENT X.
 TANGENT FOR A REAL ARGUMENT X.
 TANGENT FOR A REAL ARGUMENT X.
 TANH COMPUTES THE HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
 TAYLOR METHOD; THIS METHOD CAN BE USED TO SOLVE LARGE AND SPARSE SYSTEMS, PROVIDED HIGHER
 TAYLOR METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS, WITH KNOWN EIGEN VALUE SPEC
 TAYLOR SERIES.
 TAYPOL EVALUATES THE FIRST K TERMS OF A TAYLOR SERIES.
 TFMPREVEC IN COMBINATION WITH TFMSYMTRIZ CALCULATES THE TRANSFORMING MATRIX.
 TFHREAHES TRANSFORMS A MATRIX INTO A SIMILAR UPPER-HESSSENBERG MATRIX BY MEANS OF WILKINSON
 TFHREAHES.
 TFHREAHES.
 TFMSYMTRII TRANSFORMS A REAL SYMMETRIC MATRIX INTO A SIMILAR TRIAGONAL ONE BY MEANS OF H
 TFMSYMTRII.
 TFMSYMTRIZ CALCULATES THE TRANSFORMING MATRIX.
 TFMSYMTRIZ TRANSFORMS A REAL SYMMETRIC MATRIX INTO A SIMILAR TRIAGONAL ONE BY MEANS OF H
 TFMSYMTRIZ.
 TRANSFORMATION (ON A VECTOR) CORRESPONDING TO TFHREAHES.
 TRANSFORMATION (ON COLUMNS) CORRESPONDING TO TFHREAHES.
 TRANSFORMATION CORRESPONDING TO EQLBR.
 TRANSFORMATION CORRESPONDING TO HSHCOMHES.
 TRANSFORMATION CORRESPONDING TO HSHRMTRI.
 TRANSFORMATION CORRESPONDING TO TFHSYMTRI.
 TRANSFORMATION CORRESPONDING TO TFMSYMTRIZ.
 TRANSFORMATION FOLLOWED BY A COMPLEX DIAGONAL TRANSFORMATION INTO A SIMILAR UNITARY UPPER-
 TRANSFORMATION INTO A SIMILAR UNITARY UPPER-HESSSENBERG MATRIX WITH A REAL NONNEGATIVE SUBD
 TRANSFORMATION.
 TRANSFORMATION.
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 TRANSFORMATION.
 TRANSFORMS A COMPLEX MATRIX BY MEANS OF HOUSEHOLDER'S TRANSFORMATION FOLLOWED BY A COMPLEX
 TRANSFORMS A VECTOR INTO A VECTOR PROPORTIONAL TO A UNIT VECTOR.
 TRANSFORMS A HERMITIAN MATRIX INTO A SIMILAR REAL SYMMETRIC TRIAGONAL MATRIX.
 TRANSFORMS A MATRIX INTO A SIMILAR UPPER-HESSSENBERG MATRIX BY MEANS OF WILKINSON'S TRANSFO
 TRANSFORMS A MATRIX TO BIDIAGONAL FORM, BY MULTIPLYING AND POSTMULTIPLYING WITH ORTHOGO
 TRANSFORMS A POLYNOMIAL FROM THE NEWTON FORM INTO THE GRUNERT FORM.
 TRANSFORMS THE CARTESIAN COORDINATES OF A COMPLEX NUMBER INTO POLAR COORDINATES.
 TRIANGULAR DECOMPOSITION AND CALCULATES THE 1-NORM OF THE INVERSE MATRIX.
 TRIANGULAR DECOMPOSITION OF A BAND MATRIX, USING PARTIAL PIVOTING.
 TRIANGULAR DECOMPOSITION OF A SYMMETRIC TRIAGONAL MATRIX.
 TRIANGULAR DECOMPOSITION OF A TRIAGONAL MATRIX.
 TRIANGULAR DECOMPOSITION OF A TRIAGONAL MATRIX, USING PARTIAL PIVOTING.
 TRIANGULAR DECOMPOSITION WITH A COMBINATION OF PARTIAL AND COMPLETE PIVOTING.
 TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING.
 TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING.
 TRIANGULAR DECOMPOSITION WITHOUT PIVOTING.
 TRIANGULAR DECOMPOSITION OF THE MATRIX OF A SYSTEM OF LINEAR EQUATIONS AND CALCULATES AN UP

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CTION OF TWO VARIABLES OVER A QUARKS PROBLEM BY HOUSEHOLDER TDEC DELIVERS THE HOUSEHOLDER UATIONS WHOSE MATRIX HAS BEEN LGULATES THE DETERMINANT OF A

TRIANGULAR DOMAIN.
TRIANGULARIZATION WITH COLUMN INTERCHANGES AND CALCULATES THE DIAGONAL OF THE INVERSE OF M
TRIANGULARIZATION WITH COLUMN INTERCHANGES OF THE MATRIX OF A LINEAR LEAST SQUARES PROBLEM
TRIANGULARLY DECOMPOSED BY DEC.
TRIANGULARLY DECOMPOSED MATRIX.

S EIGENVECTORS OF A SYMMETRIC E, EIGENVALUES OF A SYMMETRIC HE EIGENVALUES OF A SYMMETRIC D EIGENVECTORS OF A SYMMETRIC GORAL LLEMENTS OF A HERMITIAN TRIANGULAR DECOMPOSITION OF A

TRICUB COMPUTES THE DEFINITE INTEGRAL OF A FUNCTION OF TWO VARIABLES OVER A TRIANGULAR DOM
TRIDIAGONAL MATRIX BY MEANS OF INVERSE ITERATION.
TRIDIAGONAL MATRIX BY MEANS OF LINEAR INTERPOLATION USING A STURM SEQUENCE.
TRIDIAGONAL MATRIX BY MEANS OF QR ITERATION.
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INTO A SIMILAR REAL SYMMETRIC TRIANGULAR DECOMPOSITION OF A MMETRIC MATRIX INTO A SIMILAR MMETRIC MATRIX INTO A SIMILAR

TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITH PART
TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITHOUT P
TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION.
TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS THE TRIANGULAR DECOMPOSITION BEING GIVEN.
TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
TRIDIAGONAL SYSTEM OF LINEAR EQUATIONS, THE TRIANGULAR DECOMPOSITION BEING GIVEN.

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JECOSLTRI SOLVES A
GSOLSYMTRI SOLVES A SYMMETRIC
SOLTRI SOLVES A
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SOLSYMTRI SOLVES A SYMMETRIC

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UNDERFLOW TESTS WHETHER A VALUE IS AN UNDERFLOW VALUE.
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UNITARY UPPER-HESSSENBERG MATRIX WITH A REAL NONNEGATIVE SUBDIAGONAL.
UPPER-HESSSENBERG MATRIX BY MEANS OF DOUBLE QR ITERATION.
UPPER-HESSSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
UPPER-HESSSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
UPPER-HESSSENBERG MATRIX BY MEANS OF WILKINSON'S TRANSFORMATION.
UPPER-HESSSENBERG MATRIX WITH A REAL NONNEGATIVE SUBDIAGONAL.
UPPER-HESSSENBERG MATRIX WITH A REAL SUBDIAGONAL.
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UPPER-HESSSENBERG MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL, BY MEANS OF SINGLE QR ITE
UPPERBOUND FOR THE ERROR IN THE INVERSE MATRIX IS ALSO GIVEN.
UPPERBOUND FOR THE ERROR IN THE SOLUTION IS CALCULATED.
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UPPERBOUND FOR THE ERROR IN THE SOLUTION OF THAT SYSTEM.
UPPERBOUND FOR THE RELATIVE ERROR IN THE SOLUTION OF THAT SYSTEM.
VALQRICOY CALCULATES THE EIGENVALUES OF A COMPLEX UPPER-HESSSENBERG MATRIX WITH A REAL SUBD
VALSYMTRI CALCULATES ALL, OR SOME CONSECUTIVE, EIGENVALUES OF A SYMMETRIC TRIANGULAR MATR
VAN WJNGAARDEN TRANSFORMATION.
VECSYMTRI CALCULATES EIGENVECTORS OF A SYMMETRIC TRIANGULAR MATRIX BY MEANS OF INVERSE IT
VECTOR AND A COLUMN VECTOR BY DOUBLE PRECISION ARITHMETIC.
VECTOR AND A ROW VECTOR BY DOUBLE PRECISION ARITHMETIC.
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UPPER-HESSSENBERG MATRIX WITH A REAL NONNEGATIVE SUBDIAGONAL.
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VAN WJNGAARDEN TRANSFORMATION.
VECSYMTRI CALCULATES EIGENVECTORS OF A SYMMETRIC TRIANGULAR MATRIX BY MEANS OF INVERSE IT
VECTOR AND A COLUMN VECTOR BY DOUBLE PRECISION ARITHMETIC.
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- 30001 275 HBASE DELIVERS THE BASE OF THE ARITHMETIC OF THE COMPUTER.
 30002 275 AKBEB DELIVERS THE ARITHMETIC ERROR BOUND OF THE COMPUTER.
 30003 275 UNARF DELIVERS THE SMALLEST (IN ABSOLUTE VALUE) REPRESENTABLE REAL NUMBER.
 30004 275 GANT DELIVERS THE LARGEST REPRESENTABLE REAL NUMBER.
 30005 275 INTCAP DELIVERS THE INTEGER CAPACITY.
 30006 273 PI DELIVERS A FULL PRECISION APPROXIMATION TO PI=CA 3.14....
 30007 273 E DELIVERS A FULL PRECISION APPROXIMATION TO E=CA 2.718....
 30008 275 OVERFLOW TESTS WHETHER A VALUE IS AN OVERFLOW VALUE.
 30009 275 UNDERFLOW TESTS WHETHER A VALUE IS AN UNDERFLOW VALUE.
 31010 1 INIVC INITIALIZES A VECTOR WITH A CONSTANT.
 31011 1 INIMAT INITIALIZES A MATRIX WITH A CONSTANT.
 31012 1 INIMATD INITIALIZES A (CO)DIAGONAL OF A MATRIX.
 31013 1 INISYHD INITIALIZES A (CO)DIAGONAL OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 31014 1 INISYHRM INITIALIZES A ROW OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 31020 5 MULVEC STORES A CONSTANT MULTIPLIED BY A VECTOR INTO A VECTOR.
 31021 5 MULROW STORES A CONSTANT MULTIPLIED BY A ROW VECTOR INTO A ROW VECTOR.
 31022 5 MULCOL STORES A CONSTANT MULTIPLIED BY A COLUMN VECTOR INTO A COLUMN VECTOR.
 31030 3 DUPVEC COPIES A VECTOR INTO ANOTHER VECTOR.
 31031 3 DUPVEGRM COPIES A ROW VECTOR INTO A VECTOR.
 31032 3 DUPROWVEC COPIES A VECTOR INTO A ROW VECTOR.
 31033 3 DUPVECCOL COPIES A COLUMN VECTOR INTO A VECTOR.
 31034 3 DUPCOLVEC COPIES A VECTOR INTO A COLUMN VECTOR.
 31035 3 DUPMAT COPIES A MATRIX INTO ANOTHER MATRIX.
 31040 245 PUL EVALUATES A POLYNOMIAL.
 31042 229 CHEPPL EVALUATES A CHEBYSHEV POLYNOMIAL.
 31043 229 ALLCHEPOL EVALUATES ALL CHEBYSHEV POLYNOMIALS UP TO A CERTAIN DEGREE.
 31046 229 CHEPOLSER EVALUATES A CHEBYSHEV SERIES.
 31050 43 NEWGN TRANSFORMS A POLYNOMIAL FROM THE NEWTON FORM INTO THE GRUNERT FORM.
 31061 241 INFNMKVEC CALCULATES THE INFINITY-NORM OF A VECTOR.
 31062 241 INFNMHRM CALCULATES THE INFINITY-NORM OF A ROW VECTOR.
 31063 241 INFNMKCOL CALCULATES THE INFINITY-NORM OF A COLUMN VECTOR.
 31064 241 INFNMHAT CALCULATES THE INFINITY-NORM OF A MATRIX.
 31065 241 ONENRMVEC CALCULATES THE 1-NORM OF A VECTOR.
 31066 241 ONENRMHRM CALCULATES THE 1-NORM OF A ROW VECTOR.
 31067 241 ONENRMKCOL CALCULATES THE 1-NORM OF A COLUMN VECTOR.
 31068 241 ONENRMHAT CALCULATES THE 1-NORM OF A MATRIX.
 31069 241 ABSMAXMAT CALCULATES THE MODULUS OF THE LARGEST ELEMENT OF A MATRIX AND DELIVERS THE INDICES OF THE MAXIMAL ELEMENT.
 31070 269 HSHVECMT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN IN A ONE-DIMENSIONAL ARRAY.
 31071 269 HSHCOLMAT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A COLUMN IN A TWO-DIMENSIONAL ARRAY.
 31072 269 HSHROWMAT PREMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A ROW IN A TWO-DIMENSIONAL ARRAY.
 31073 269 HSHVECTAM POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN IN A ONE-DIMENSIONAL ARRAY.
 31074 269 HSHCOLTAM POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A COLUMN IN A TWO-DIMENSIONAL ARRAY.
 31075 269 HSHROWTAM POSTMULTIPLIES A MATRIX BY A HOUSEHOLDER MATRIX, THE VECTOR DEFINING THIS HSH MATRIX BEING GIVEN AS A ROW IN A TWO-DIMENSIONAL ARRAY.
 31090 203 SINSER EVALUATES A SINE SERIES.
 31091 203 COSSER EVALUATES A COSINE SERIES.
 31092 203 FOUSSER EVALUATES A FOURIER SERIES WITH EQUAL SINE AND COSINE COEFFICIENTS.
 31093 203 FOUSSER1 EVALUATES A FOURIER SERIES.
 31094 203 FOUSSER2 EVALUATES A FOURIER SERIES.
 31095 203 COMFOUSER EVALUATES A COMPLEX FOURIER SERIES WITH REAL COEFFICIENTS.

- 31096 203 COMFOUSER1 EVALUATES A COMPLEX FOURIER SERIES.
- 31097 203 COMFOUSER2 EVALUATES A COMPLEX FOURIER SERIES.
- 31101 271 DPADD ADDS TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION SUM.
- 31102 271 DPSSUB SUBTRACTS TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION DIFFERENCE.
- 31103 271 DPMUL MULTIPLIES TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION PRODUCT.
- 31104 271 DPDIV DIVIDES TWO SINGLE PRECISION NUMBERS TO A DOUBLE PRECISION QUOTIENT.
- 31105 271 LNGADD ADDS TWO DOUBLE PRECISION NUMBERS.
- 31106 271 LNGSUB SUBTRACTS TWO DOUBLE PRECISION NUMBERS.
- 31107 271 LNGMUL MULTIPLIES TWO DOUBLE PRECISION NUMBERS.
- 31108 271 LNGDIV DIVIDES TWO DOUBLE PRECISION NUMBERS.
- 31131 5 COLCST MULTIPLIES A COLUMN VECTOR BY A CONSTANT.
- 31132 5 ROWCST MULTIPLIES A ROW VECTOR BY A CONSTANT.
- 31200 201 LNGINTADD COMPUTES THE SUM OF LONG NONNEGATIVE INTEGERS.
- 31201 201 LNGINTSUBTRACT COMPUTES THE DIFFERENCE OF LONG NONNEGATIVE INTEGERS.
- 31202 201 LNGINTMULT COMPUTES THE PRODUCT OF LONG NONNEGATIVE INTEGERS.
- 31203 201 LNGINTDIVIDE COMPUTES THE QUOTIENT WITH REMAINDER OF LONG NONNEGATIVE INTEGERS.
- 31204 201 LNGINTPOWER COMPUTES U**POWER, WHERE U IS A LONG NONNEGATIVE INTEGER AND POWER IS THE POSITIVE (SINGLE-LENGTH) EXPONENT.
- 31241 245 TAYPOL EVALUATES THE FIRST K TERMS OF A TAYLOR SERIES.
- 31242 245 NORDERPOL EVALUATES THE FIRST K NORMALIZED DERIVATIVES OF A POLYNOMIAL (I.E. J-TH DERIVATIVE/(J FACTORIAL)), J=0,1,....,K <= DEGREE.
- 31243 245 DERPOL EVALUATES THE FIRST K DERIVATIVES OF A POLYNOMIAL.
- 31248 205 INTCMS COMPUTES THE INDEFINITE INTEGRAL OF A GIVEN CHEBYSHEV SERIES.
- 31362 211 ALLZERORPOL CALCULATES ALL ZEROS OF AN ORTHOGONAL POLYNOMIAL.
- 31363 211 LUPZERORPOL CALCULATES A NUMBER OF ADJACENT UPPER OR LOWER ZEROS OF AN ORTHOGONAL POLYNOMIAL.
- 31364 211 SELZERORPOL CALCULATES A NUMBER OF ADJACENT ZEROS OF AN ORTHOGONAL POLYNOMIAL.
- 31500 15 FULMATVEC CALCULATES THE PRODUCT A * B, WHERE A IS A GIVEN MATRIX AND B IS A VECTOR.
- 31501 15 FULTRANVEC CALCULATES THE PRODUCT A' * B, WHERE A' IS THE TRANSPOSED OF THE MATRIX A AND B IS A VECTOR.
- 31502 15 FULSYMMATVEC CALCULATES THE PRODUCT A * B, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY AND B IS A VECTOR.
- 31503 15 RESVEC CALCULATES THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A GIVEN MATRIX, B AND C ARE VECTORS AND X IS A SCALAR.
- 31504 15 SYMRESVEC CALCULATES THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY, B AND C ARE VECTORS AND X IS A SCALAR.
- 31505 285 LNGFULMATVEC CALCULATES BY DOUBLE PRECISION ARITHMETIC THE PRODUCT A * B, WHERE A IS A GIVEN MATRIX AND B IS A VECTOR.
- 31506 285 LNGFULTRANVEC CALCULATES BY DOUBLE PRECISION ARITHMETIC THE PRODUCT A' * B, WHERE A' IS THE TRANSPOSED OF THE MATRIX A AND B IS A VECTOR.
- 31507 285 LNGFULSYMMATVEC CALCULATES BY DOUBLE PRECISION ARITHMETIC THE PRODUCT A * B, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY AND B IS A VECTOR.
- 31508 285 LNGRESVEC CALCULATES BY DOUBLE PRECISION ARITHMETIC THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A GIVEN MATRIX, B AND C ARE VECTORS AND X IS A SCALAR.
- 31509 285 LNGSYMRESVEC CALCULATES BY DOUBLE PRECISION ARITHMETIC THE RESIDUAL VECTOR A * B + X * C, WHERE A IS A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY, B AND C ARE VECTORS AND X IS A SCALAR.
- 32010 131 EULER PERFORMS THE SUMMATION OF AN ALTERNATING INFINITE SERIES.
- 32020 131 SUMPOSSERIES PERFORMS THE SUMMATION OF A INFINITE SERIES WITH POSITIVE MONOTONICALLY DECREASING TERMS USING THE VAN WIJNGAARDEN TRANSFORMATION.
- 32051 135 INTEGRAL CALCULATES THE DEFINITE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE OR INFINITE INTERVAL OR OVER A NUMBER OF CONSECUTIVE INTERVALS.
- 32070 133 GADRAT COMPUTES THE DEFINITE INTEGRAL OF A FUNCTION OF ONE VARIABLE OVER A FINITE INTERVAL.
- 32075 257 TRICUB COMPUTES THE DEFINITE INTEGRAL OF A FUNCTION OF TWO VARIABLES OVER A TRIANGULAR DOMAIN.
- 33010 141 RK1 SOLVES A SINGLE 1ST ORDER DIFFERENTIAL EQUATION BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD.
- 33012 171 RK2 INTEGRATES A SINGLE 2ND ORDER DIFFERENTIAL EQUATION (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD.
- 33013 173 RK2N SOLVES A SYSTEM OF 2ND ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD.
- 33014 175 RK3 SOLVES A SINGLE 2ND ORDER DIFFERENTIAL EQUATION (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD; THIS METHOD CAN ONLY BE USED IF THE RIGHT HAND SIDE OF THE DIFFERENTIAL EQUATION DOES NOT DEPEND ON Y'.
- 33015 177 RK3N SOLVES A SYSTEM OF 2ND ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD; THIS METHOD CAN ONLY BE USED IF THE RIGHT HAND SIDE OF THE DIFFERENTIAL EQUATIONS DOES NOT DEPEND ON Y'.

- 33016 145 RK4A SOLVES A SINGLE 1ST ORDER DIFFERENTIAL EQUATION BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD; THE INTEGRATION IS TERMINATED AS SOON AS A CONDITION ON X AND Y, WHICH IS SUPPLIED BY THE USER, IS SATISFIED.
- 33017 147 RK4HA SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD; THE INTEGRATION IS TERMINATED AS SOON AS A CONDITION ON X(0),...,X(N), SUPPLIED BY THE USER, IS SATISFIED.
- 33016 149 KKSNA SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD; THE ARC LENGTH IS INTRODUCED AS AN INTEGRATION VARIABLE; THE INTEGRATION IS TERMINATED AS SOON AS A CONDITION ON X(0),...,X(N), SUPPLIED BY THE USER, IS SATISFIED.
- 33033 143 RKE SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 5TH ORDER RUNGE-KUTTA METHOD.
- 33040 167 MODIFIED TAYLOR SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 1ST, 2ND OR 3RD ORDER ONE-STEP TAYLOR METHOD; THIS METHOD CAN BE USED TO SOLVE LARGE AND SPARSE SYSTEMS, PROVIDED HIGHER ORDER DERIVATIVES CAN EASILY BE OBTAINED.
- 33050 169 EXPONENTIALLY FITTED TAYLOR SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A VARIABLE ORDER TAYLOR METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS, WITH KNOWN EIGEN VALUE SPECTRUM, PROVIDED HIGHER ORDER DERIVATIVES CAN EASILY BE OBTAINED.
- 33061 155 ARK SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A STABILIZED RUNGE-KUTTA METHOD WITH LIMITED STORAGE REQUIREMENTS.
- 33070 157 EFRK SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 1ST, 2ND OR 3RD ORDER, EXPONENTIALLY FITTED RUNGE-KUTTA METHOD; AUTOMATIC STEP SIZE CONTROL IS NOT PROVIDED; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS WITH KNOWN EIGENVALUE SPECTRUM.
- 33080 151 MULTISTEP SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A VARIABLE ORDER MULTISTEP METHOD ADAMS-MOULTON, ADAMS-BASHFORTH OR GEAR'S METHOD; THE ORDER OF ACCURACY IS AUTOMATIC, UP TO 5TH ORDER; THIS METHOD IS SUITABLE FOR STIFF SYSTEMS.
- 33120 161 EFERK SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF AN EXPONENTIALLY FITTED, 3RD ORDER RUNGE-KUTTA METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS WITH KNOWN EIGENVALUE SPECTRUM.
- 33131 165 LINIGR2 SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF AN IMPLICIT, EXPONENTIALLY FITTED 1ST ORDER ONE-STEP METHOD; AUTOMATIC STEP-SIZE CONTROL IS NOT PROVIDED; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS.
- 33132 221 LINIGR1V3 SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF AN IMPLICIT, EXPONENTIALLY FITTED 1ST ORDER ONE-STEP METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS.
- 33135 231 IMPEX SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF THE IMPLICIT MIDPOINT RULE WITH SMOOTHING AND EXTRAPOLATION; THIS METHOD IS SUITABLE FOR THE INTEGRATION OF STIFF DIFFERENTIAL EQUATIONS.
- 33160 159 EFSRK SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 3RD ORDER, EXPONENTIALLY FITTED, SEMI-IMPLICIT RUNGE-KUTTA METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS.
- 33170 225 RICHARDSON SOLVES A SYSTEM OF LINEAR EQUATIONS WITH POSITIVE REAL EIGENVALUES (ELLIPTIC BOUNDARY VALUE PROBLEM) BY MEANS OF A NON-STATIONARY 2ND ORDER ITERATIVE METHOD.
- 33171 225 ELIMINATION SOLVES A SYSTEM OF LINEAR EQUATIONS WITH POSITIVE REAL EIGENVALUES (ELLIPTIC BOUNDARY VALUE PROBLEM) BY MEANS OF A NON-STATIONARY 2ND ORDER ITERATIVE METHOD, WHICH IS AN ACCELERATION OF RICHARDSON'S METHOD.
- 33180 153 DIFFSYS SOLVES A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM); BY EXTRAPOLATION, APPLIED TO LOW ORDER RESULTS, A HIGH ORDER OF ACCURACY IS OBTAINED; THIS METHOD IS SUITABLE FOR SMOOTH PROBLEMS WHEN HIGH ACCURACY IS REQUIRED.
- 33191 223 GMS SOLVES AN AUTONOMOUS SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS (INITIAL VALUE PROBLEM) BY MEANS OF A 3RD ORDER MULTISTEP METHOD; THIS METHOD CAN BE USED TO SOLVE STIFF SYSTEMS.
- 33300 261 FEMLAG SOLVES A LINEAR TWO-POINT BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER SELF-ADJOINT DIFFERENTIAL EQUATION BY A KITZ-GALERKIN METHOD; THE COEFFICIENT OF Y'' IS SUPPOSED TO BE UNITY.
- 33301 261 FEMLAGSYM SOLVES A LINEAR TWO-POINT BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER SELF-ADJOINT DIFFERENTIAL EQUATION BY A RITZ-GALERKIN METHOD.
- 33302 203 FEMLAGSKEM SOLVES A LINEAR TWO-POINT BOUNDARY-VALUE PROBLEM FOR A SECOND ORDER DIFFERENTIAL EQUATION BY A RITZ-GALERKIN METHOD.
- 33303 265 FEHHERNSYM SOLVES A LINEAR TWO-POINT BOUNDARY-VALUE PROBLEM FOR A FOURTH ORDER SELF-ADJOINT DIFFERENTIAL EQUATION WITH DIRICHLET BOUNDARY CONDITIONS BY A RITZ-GALERKIN METHOD.
- 34010 7 VECVEC != SCALAR PRODUCT OF A VECTOR AND A VECTOR.
- 34011 7 MATVEC != SCALAR PRODUCT OF A ROW VECTOR AND A VECTOR.
- 34012 7 TAMVEC != SCALAR PRODUCT OF A COLUMN VECTOR AND A VECTOR.
- 34013 7 MATMAT != SCALAR PRODUCT OF A ROW VECTOR AND A COLUMN VECTOR.
- 34014 7 TAMMAT != SCALAR PRODUCT OF A COLUMN VECTOR AND A COLUMN VECTOR.
- 34015 7 MATTAH != SCALAR PRODUCT OF A ROW VECTOR AND A ROW VECTOR.
- 34016 7 SEQVEC != SCALAR PRODUCT OF TWO VECTORS GIVEN IN ONE-DIMENSIONAL ARRAYS, WHERE THE MUTUAL SPACINGS BETWEEN THE INDICES OF THE

- 34017 1ST VECTOR CHANGE LINEARLY.
- 34018 7 SCAPROD != SCALAR PRODUCT OF TWO VECTORS GIVEN IN ONE-DIMENSIONAL ARRAYS, WHERE THE SPACINGS OF BOTH VECTORS ARE CONSTANT.
- 34018 7 SYMMATVEC != SCALAR PRODUCT OF A VECTOR AND A ROW OF A SYMMETRIC MATRIX, WHOSE UPPERTRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
- 34020 9 ELMVEC ADDS A CONSTANT TIMES A VECTOR TO A VECTOR.
- 34021 9 ELMVECCOL ADDS A CONSTANT TIMES A COLUMN VECTOR TO A VECTOR.
- 34022 9 ELMCOLVEC ADDS A CONSTANT TIMES A VECTOR TO A COLUMN VECTOR.
- 34023 9 ELMCOL ADDS A CONSTANT TIMES A COLUMN VECTOR TO A COLUMN VECTOR.
- 34024 9 ELMROW ADDS A CONSTANT TIMES A ROW VECTOR TO A ROW VECTOR.
- 34025 9 MAXELMROW ADDS A CONSTANT TIMES A ROW VECTOR TO A ROW VECTOR, MAXELMROW=THE SUBSCRIPT OF AN ELEMENT OF THE NEW ROW VECTOR WHICH IS OF MAXIMUM ABSOLUTE VALUE.
- 34026 9 ELMVECROW ADDS A CONSTANT TIMES A ROW VECTOR TO A VECTOR.
- 34027 9 ELMROWVEC ADDS A CONSTANT TIMES A VECTOR TO A ROW VECTOR.
- 34028 9 ELMROWCOL ADDS A CONSTANT TIMES A COLUMN VECTOR TO A ROW VECTOR.
- 34029 9 ELMCOLROW ADDS A CONSTANT TIMES A ROW VECTOR TO A COLUMN VECTOR.
- 34030 11 ICHVEC INTERCHANGES TWO VECTORS GIVEN IN ARRAY A(I:U) AND ARRAY ALSHIFT + L ! SHIFT + U).
- 34031 11 ICHCOL INTERCHANGES TWO COLUMNS OF A MATRIX.
- 34032 11 ICHROW INTERCHANGES TWO ROWS OF MATRIX.
- 34033 11 ICHROWCOL INTERCHANGES A ROW AND A COLUMN OF A MATRIX.
- 34034 11 ICHSEQVEC INTERCHANGES A ROW AND A COLUMN OF AN UPPERTRIANGULAR MATRIX, WHICH IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
- 34035 11 ICHSEQ INTERCHANGES TWO COLUMNS OF AN UPPERTRIANGULAR MATRIX, WHICH IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
- 34040 13 ROTCOL REPLACES TWO COLUMN VECTORS X AND Y BY TWO VECTORS CX + SY AND CY - SX.
- 34041 13 ROTROW REPLACES TWO ROW VECTORS X AND Y BY TWO VECTORS CX + SY AND CY - SX.
- 34051 49 SOL SOLVES THE SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY DEC.
- 34053 51 INV CALCULATES THE INVERSE OF A MATRIX THAT HAS BEEN TRIANGULARLY DECOMPOSED BY DEC.
- 34061 49 SOLELM SOLVES A SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELM OR GSSERB.
- 34071 79 SOLBND SOLVES A SYSTEM OF LINEAR EQUATIONS, THE MATRIX BEING DECOMPOSED BY DECBND.
- 34131 65 LSQSOQLV CALCULATES A LINEAR LEAST SQUARES PROBLEM IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY LSQRTDEC.
- 34132 63 LSQOGLINV CALCULATES THE DIAGONAL ELEMENTS OF THE INVERSE OF M*M, WHERE M IS THE COEFFICIENT MATRIX OF A LINEAR LEAST SQUARES PROBLEM.
- 34134 63 LSQRTDEC DELIVERS THE HOUSEHOLDER TRIANGULARIZATION WITH COLUMN INTERCHANGES OF THE MATRIX OF A LINEAR LEAST SQUARES PROBLEM.
- 34135 65 LSQRTDECOSOL SOLVES A LINEAR LEAST SQUARES PROBLEM BY HOUSEHOLDER TRIANGULARIZATION WITH COLUMN INTERCHANGES AND CALCULATES THE DIAGONAL OF THE INVERSE OF M*M, WHERE M IS THE COEFFICIENT MATRIX.
- 34136 207 LSQINV CALCULATES THE INVERSE OF THE MATRIX S*S, WHERE S IS THE COEFFICIENT MATRIX OF A LINEAR LEAST SQUARES PROBLEM.
- 34140 101 TFMSYTR12 TRANSFORMS A REAL SYMMETRIC MATRIX INTO A SIMILAR TRIAGONAL ONE BY MEANS OF HOUSEHOLDER'S TRANSFORMATION.
- 34141 101 BAKSYTR12 PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO TFMSYTR12.
- 34142 101 TFMPREVEC IN COMBINATION WITH TFMSYTR12 CALCULATES THE TRANSFORMING MATRIX.
- 34143 101 TFMSYTR11 TRANSFORMS A REAL SYMMETRIC MATRIX INTO A SIMILAR TRIAGONAL ONE BY MEANS OF HOUSEHOLDER'S TRANSFORMATION.
- 34144 101 BAKSYTR11 PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO TFMSYTR11.
- 34150 215 ZEROIN FINDS (IN A GIVEN INTERVAL) A ZERO OF A FUNCTION OF ONE VARIABLE.
- 34151 111 VALSYMTRI CALCULATES ALL, OR SOME CONSECUTIVE, EIGENVALUES OF A SYMMETRIC TRIAGONAL MATRIX BY MEANS OF LINEAR INTERPOLATION USING A STURM SEQUENCE.
- 34152 111 VECSYMTRI CALCULATES EIGENVECTORS OF A SYMMETRIC TRIAGONAL MATRIX BY MEANS OF INVERSE ITERATION.
- 34153 113 EIGVALSYM2 CALCULATES ALL (OR SOME) EIGENVALUES OF A SYMMETRIC MATRIX USING LINEAR INTERPOLATION OF A FUNCTION DERIVED FROM A STURM SEQUENCE.
- 34154 113 EIGSYM2 CALCULATES EIGENVALUES AND EIGENVECTORS BY MEANS OF INVERSE ITERATION.
- 34155 113 EIGVALSYM1 CALCULATES ALL (OR SOME) EIGENVALUES OF A SYMMETRIC MATRIX USING LINEAR INTERPOLATION OF A FUNCTION DERIVED FROM A STURM SEQUENCE.
- 34156 113 EIGSYM1 CALCULATES EIGENVALUES AND EIGENVECTORS BY MEANS OF INVERSE ITERATION.
- 34160 111 QRVALSYMTRI CALCULATES THE EIGENVALUES OF A SYMMETRIC TRIAGONAL MATRIX BY MEANS OF QR ITERATION.
- 34161 111 QRISYTRI CALCULATES THE EIGENVALUES AND EIGENVECTORS OF A SYMMETRIC TRIAGONAL MATRIX BY MEANS OF QR ITERATION.
- 34162 113 QRIVALSYM2 CALCULATES THE EIGENVALUES OF A SYMMETRIC MATRIX BY MEANS OF QR ITERATION.
- 34163 113 QRISYH CALCULATES ALL EIGENVALUES AND EIGENVECTORS OF A SYMMETRIC MATRIX BY MEANS OF QR ITERATION.
- 34164 113 QRIVALSYM1 CALCULATES THE EIGENVALUES OF A SYMMETRIC MATRIX BY MEANS OF QR ITERATION.

- 3+170 103 TFMREAHES TRANSFORMS A MATRIX INTO A SIMILAR UPPER-HESSSENBERG MATRIX BY MEANS OF WILKINSON'S TRANSFORMATION.
 3+171 103 BAKREAHES1 PERFORMS THE BACK TRANSFORMATION (ON A VECTOR) CORRESPONDING TO TFMREAHES.
 3+172 103 BAKREAHES2 PERFORMS THE BACK TRANSFORMATION (ON COLUMNS) CORRESPONDING TO TFMREAHES.
 3+173 97 EQLBKB EQUILIBRATES A MATRIX BY MEANS OF A DIAGONAL SIMILARITY TRANSFORMATION.
 3+174 97 BAKLBK PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO EQLBKB.
 3+180 115 KEAVALQRI CALCULATES THE EIGENVALUES OF A REAL UPPER-HESSSENBERG MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL, BY MEANS OF SINGLE QR ITERATION.
 3+181 115 KEAVECHES CALCULATES AN EIGENVECTOR CORRESPONDING TO A GIVEN REAL EIGENVALUE OF A REAL UPPER-HESSSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
 3+182 117 REAEIGVAL CALCULATES THE EIGENVALUES OF A MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL.
 3+183 17 REAESL NORMALIZES THE COLUMNS OF A TWO-DIMENSIONAL ARRAY.
 3+184 117 REAEIG1 CALCULATES THE EIGENVECTORS AND EIGENVALUES OF A MATRIX, PROVIDED THAT THEY ARE ALL REAL.
 3+186 115 KEAQR1 CALCULATES ALL EIGENVALUES AND EIGENVECTORS OF A REAL UPPER-HESSSENBERG MATRIX, PROVIDED THAT ALL EIGENVALUES ARE REAL, BY MEANS OF SINGLE QR ITERATION.
 3+187 117 REAEIG3 CALCULATES THE EIGENVECTORS AND EIGENVALUES OF A MATRIX, PROVIDED THAT THEY ARE ALL REAL.
 3+190 115 COMVALQRI CALCULATES THE REAL AND COMPLEX EIGENVALUES OF A REAL UPPER-HESSSENBERG MATRIX BY MEANS OF DOUBLE QR ITERATION.
 3+191 115 COMVECHES CALCULATES THE EIGENVECTOR CORRESPONDING TO A GIVEN COMPLEX EIGENVALUE OF A REAL UPPER-HESSSENBERG MATRIX BY MEANS OF INVERSE ITERATION.
 3+192 117 COMEIGVAL CALCULATES THE EIGENVALUES OF A MATRIX.
 3+193 29 COMSCL NORMALIZES REAL AND COMPLEX EIGENVECTORS.
 3+194 117 COMEIG1 CALCULATES THE EIGENVALUES AND EIGENVECTORS OF A MATRIX.
 3+210 139 LINEMIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES IN A GIVEN DIRECTION.
 3+211 139 KNKLUPD ADDS A RANK-1 MATRIX TO A SYMMETRIC MATRIX.
 3+212 139 DAVUPU ADDS A RANK-2 MATRIX TO A SYMMETRIC MATRIX.
 3+213 139 FLEUPU ADDS A RANK-2 MATRIX TO A SYMMETRIC MATRIX.
 3+214 19 RNKXMIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES.
 3+215 19 FLEMIN MINIMIZES A FUNCTION OF SEVERAL VARIABLES.
 3+220 95 CONJ GRAD SOLVES A POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY THE METHOD OF CONJUGATE GRADIENTS.
 3+231 45 GSSELN PERFORMS A TRIANGULAR DECOMPOSITION WITH A COMBINATION OF PARTIAL AND COMPLETE PIVOTING.
 3+232 49 GSSSOL SOLVES A SYSTEM OF LINEAR EQUATIONS.
 3+235 51 INVL CALCULATES THE INVERSE OF A MATRIX THAT HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELN OR GSSSERB. THE 1-NORM OF THE INVERSE MATRIX MIGHT ALSO BE CALCULATED.
 3+236 51 GSSINV CALCULATES THE INVERSE OF A MATRIX.
 3+240 45 ONENRMVN CALCULATES THE 1-NORM OF THE INVERSE OF A MATRIX WHOSE TRIANGULARLY DECOMPOSED FORM IS DELIVERED BY GSSELN.
 3+241 45 ERBELM CALCULATES A ROUGH UPPERBOUND FOR THE ERROR IN THE SOLUTION OF A SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX IS TRIANGULARLY DECOMPOSED BY GSSELN.
 3+242 45 GSSSERB PERFORMS A TRIANGULAR DECOMPOSITION OF THE MATRIX OF A SYSTEM OF LINEAR EQUATIONS AND CALCULATES AN UPPERBOUND FOR THE RELATIVE ERROR IN THE SOLUTION OF THAT SYSTEM.
 3+243 49 GSSSOLERB SOLVES A SYSTEM OF LINEAR EQUATIONS AND CALCULATES A ROUGH UPPERBOUND FOR THE RELATIVE ERROR IN THE CALCULATED SOLUTION.
 3+244 51 GSSINVERB CALCULATES THE INVERSE OF A MATRIX AND 1-NORM, AN UPPERBOUND FOR THE ERROR IN THE INVERSE MATRIX IS ALSO GIVEN.
 3+250 53 ITISOL SOLVES A SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS BEEN TRIANGULARLY DECOMPOSED BY GSSELN OR GSSSERB. THIS SOLUTION IS IMPROVED ITERATIVELY.
 3+251 53 GSSITISOL SOLVES A SYSTEM OF LINEAR EQUATIONS AND THE SOLUTION IS IMPROVED ITERATIVELY.
 3+252 45 GSSIRI PERFORMS A TRIANGULAR DECOMPOSITION AND CALCULATES THE 1-NORM OF THE INVERSE MATRIX.
 3+253 53 ITISOLERB SOLVES A SYSTEM OF LINEAR EQUATIONS WHOSE MATRIX HAS TRIANGULARLY DECOMPOSED BY GSSNRI; THIS SOLUTION IS IMPROVED ITERATIVELY AN UPPERBOUND FOR THE ERROR IN THE SOLUTION IS CALCULATED.
 3+254 53 GSSATISOLERB SOLVES A SYSTEM OF LINEAR EQUATIONS; THIS SOLUTION IS IMPROVED ITERATIVELY AND AN UPPERBOUND FOR THE ERROR IN THE SOLUTION IS CALCULATED.
 3+260 109 HSHRELABID TRANSFORMS A MATRIX TO BIDIAGONAL FORM, BY PREMULTIPLYING AND POSTMULTIPLYING WITH ORTHOGONAL MATRICES.
 3+261 109 PSTIFMAT CALCULATES THE POSTMULTIPLYING MATRIX FROM THE DATA GENERATED BY HSHRELABID.
 3+262 109 PRETFMAT CALCULATES THE PREMULTIPLYING MATRIX FROM THE DATA GENERATED BY HSHRELABID.
 3+270 125 QRISNGVAL3D CALCULATES THE SINGULAR VALUES OF A BIDIAGONAL MATRIX.
 3+271 125 QRISNGVALDECBID CALCULATES THE SINGULAR VALUES DECOMPOSITION OF A MATRIX OF WHICH THE BIDIAGONAL AND THE PRE- AND POSTMULTIPLYING MATRICES ARE GIVEN.
 3+272 127 QRISNGVAL CALCULATES THE SINGULAR VALUES OF A GIVEN MATRIX.

- 34273 127 QRISNGVALDEC CALCULATES THE SINGULAR VALUES DECOMPOSITION $U * S * V'$, WITH U AND V ORTHOGONAL AND S POSITIVE DIAGONAL.
- 34280 67 SOLSVDORV SOLVES AN OVERDETERMINED SYSTEM OF LINEAR EQUATIONS, MULTIPLYING THE RIGHT-HAND SIDE BY THE PSEUDO-INVERSE OF THE GIVEN MATRIX.
- 34281 67 SOLOVR CALCULATES THE SINGULAR VALUES DECOMPOSITION AND SOLVES AN OVERDETERMINED SYSTEM OF LINEAR EQUATIONS.
- 34282 69 SOLSVDND SOLVES AN UNDERDETERMINED SYSTEM OF LINEAR EQUATIONS, MULTIPLYING THE RIGHT-HAND SIDE BY THE PSEUDO-INVERSE OF THE GIVEN MATRIX.
- 34283 69 SOLUND CALCULATES THE SINGULAR VALUES DECOMPOSITION AND SOLVES AN UNDERDETERMINED SYSTEM OF LINEAR EQUATIONS.
- 34284 71 HOMSOLVSD SOLVES THE HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS $A * X = 0$ AND $X' * A = 0$, WHERE "A" DENOTES A MATRIX AND "X" A VECTOR; (THE SINGULAR VALUE DECOMPOSITION BEING GIVEN).
- 34285 71 HOMSOL SOLVES THE HOMOGENEOUS SYSTEM OF LINEAR EQUATIONS $A * X = 0$ AND $X' * A = 0$, WHERE "A" DENOTES A MATRIX AND "X" A VECTOR.
- 34286 73 PSDINVSVD CALCULATES THE PSEUDO-INVERSE OF A MATRIX; (THE SINGULAR VALUE DECOMPOSITION BEING GIVEN).
- 34287 73 PSDINV CALCULATES THE PSEUDO-INVERSE OF A MATRIX.
- 34300 45 DEC PERFORMS A TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING.
- 34301 49 DECSOL SOLVES A SYSTEM OF LINEAR EQUATIONS WHOSE ORDER IS SMALL RELATIVE TO THE NUMBER OF BINARY DIGITS IN THE NUMBER REPRESENTATION.
- 34302 51 GECINV CALCULATES THE INVERSE OF A MATRIX WHOSE ORDER IS SMALL RELATIVE TO THE NUMBER OF BINARY DIGITS IN THE NUMBER REPRESENTATION.
- 34303 47 DETERM CALCULATES THE DETERMINANT OF A TRIANGULARLY DECOMPOSED MATRIX.
- 34310 55 CHLDEC2 CALCULATES THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMENSIONAL ARRAY.
- 34311 55 CHLDEC1 CALCULATES THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
- 34312 57 CHLDETERM2 CALCULATES OF THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN IN A TWO-DIMENSIONAL ARRAY.
- 34313 57 CHLDETERM1 CALCULATES THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC MATRIX, THE CHOLESKY DECOMPOSITION BEING GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
- 34320 75 DEC8ND PERFORMS A TRIANGULAR DECOMPOSITION OF A BAND MATRIX, USING PARTIAL PIVOTING.
- 34321 77 DETER8ND CALCULATES THE DETERMINANT OF A BAND MATRIX.
- 34322 79 DECSOL8ND SOLVES A SYSTEM OF LINEAR EQUATIONS BY GAUSSIAN ELIMINATION WITH PARTIAL PIVOTING IF THE COEFFICIENT MATRIX IS IN BAND FORM AND IS STORED ROWWISE IN A ONE-DIMENSIONAL ARRAY.
- 34330 85 CHLDEC8ND PERFORMS THE CHOLESKY DECOMPOSITION OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
- 34331 87 CHLDETERM8ND CALCULATES THE DETERMINANT OF A POSITIVE DEFINITE SYMMETRIC BAND MATRIX.
- 34332 89 CHLSOL8ND SOLVES A POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
- 34333 89 CHLDEC8L8ND SOLVES A POSITIVE DEFINITE SYMMETRIC LINEAR SYSTEM AND PERFORMS THE TRIANGULAR DECOMPOSITION BY CHOLESKY'S METHOD.
- 34340 35 COMABS CALCULATES THE MODULUS OF A COMPLEX NUMBER.
- 34341 37 COMMUL CALCULATES THE PRODUCT OF TWO COMPLEX NUMBERS.
- 34342 37 COMDIV CALCULATES THE QUOTIENT OF TWO COMPLEX NUMBERS.
- 34343 35 COMSQRT CALCULATES THE SQUARE ROOT OF A COMPLEX NUMBER.
- 34344 35 CARPOL TRANSFORMS THE CARTESIAN COORDINATES OF A COMPLEX NUMBER INTO POLAR COORDINATES.
- 34345 129 COMKWD CALCULATES THE ROOTS OF A QUADRATIC EQUATION WITH COMPLEX COEFFICIENTS.
- 34352 21 COMCOLCST MULTIPLIES A COMPLEX COLUMN VECTOR BY A COMPLEX NUMBER.
- 34353 21 COMKROWCST MULTIPLIES A COMPLEX ROW VECTOR BY A COMPLEX NUMBER.
- 34354 23 COMMATVEC CALCULATES THE SCALAR PRODUCT OF A COMPLEX ROW VECTOR AND A COMPLEX VECTOR.
- 34355 23 HSHCOMCOL TRANSFORMS A COMPLEX VECTOR INTO A VECTOR PROPORTIONAL TO A UNIT VECTOR.
- 34356 23 HSHCOMPRD PREMULTIPLIES A COMPLEX MATRIX WITH A COMPLEX HOUSEHOLDER MATRIX.
- 34357 27 ROTCOMCOL REPLACES TWO COMPLEX COLUMN VECTORS X AND Y BY TWO COMPLEX VECTORS CX + SY AND CY - SX.
- 34358 27 ROTCOMROW REPLACES TWO COMPLEX ROW VECTORS X AND Y BY TWO COMPLEX VECTORS CX + SY AND CY - SX.
- 34359 31 COMEUCNRN CALCULATES THE EUCLIDEAN NORM OF A COMPLEX MATRIX WITH LM LOWER CODIAGONALS.
- 34360 29 SCLCOM NORMALIZES THE COLUMNS OF A COMPLEX MATRIX.
- 34361 99 EQLBKCOM EQUILIBRATES A COMPLEX MATRIX.
- 34362 99 BAKLBRCOM TRANSFORMS THE EIGENVECTORS OF A COMPLEX EQUILIBRATED (BY EQLBRCOM) MATRIX INTO THE EIGENVECTORS OF THE ORIGINAL MATRIX.
- 34363 105 HSHRMTRI TRANSFORMS A HERMITIAN MATRIX INTO A SIMILAR REAL SYMMETRIC TRIANGULAR MATRIX.
- 34364 105 HSHHRMTRIAL DELIVERS THE MAIN DIAGONAL ELEMENTS AND THE SQUARES OF THE CODIAGONAL ELEMENTS OF A HERMITIAN TRIANGULAR MATRIX

- WHICH IS UNITARY SIMILAR WITH A GIVEN HERMITIAN MATRIX.
 34365 105 BAKHRMTRI PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO HSHHRMTRI.
 34366 107 HSHCOMHES TRANSFORMS A COMPLEX MATRIX BY MEANS OF HOUSEHOLDER'S TRANSFORMATION FOLLOWED BY A COMPLEX DIAGONAL TRANSFORMATION INTO A SIMILAR UNITARY UPPER-HESSSENBERG MATRIX WITH A REAL NONNEGATIVE SUBDIAGONAL.
 34367 107 BAKCOMHES PERFORMS THE BACK TRANSFORMATION CORRESPONDING TO HSHCOMHES.
 34368 119 EIGVALHRM CALCULATES THE EIGENVALUES OF A COMPLEX HERMITIAN MATRIX.
 34369 119 EIGHRM CALCULATES THE EIGENVALUES AND EIGENVECTORS OF A COMPLEX HERMITIAN MATRIX.
 34370 119 QRIVALHRM CALCULATES THE EIGENVALUES OF A COMPLEX HERMITIAN MATRIX.
 34371 119 QRIRHRM CALCULATES THE EIGENVALUES AND EIGENVECTORS OF A COMPLEX HERMITIAN MATRIX.
 34372 121 VALQRICOM CALCULATES THE EIGENVALUES OF A COMPLEX UPPER-HESSSENBERG MATRIX WITH A REAL SUBDIAGONAL.
 34373 121 QRICOM CALCULATES THE EIGENVECTORS AND THE EIGENVALUES OF A COMPLEX UPPER-HESSSENBERG MATRIX.
 34374 123 EIGVALCOM CALCULATES THE EIGENVALUES OF A COMPLEX MATRIX.
 34375 123 EIGCOM CALCULATES THE EIGENVECTORS AND EIGENVALUES OF A COMPLEX MATRIX.
 34376 25 ELMCOMHVECCOL ADDS A COMPLEX NUMBER TIMES A COMPLEX COLUMN VECTOR TO A COMPLEX VECTOR.
 34377 25 ELMCOMCOL ADDS A COMPLEX NUMBER TIMES A COMPLEX COLUMN VECTOR TO A COMPLEX COLUMN VECTOR.
 34378 25 ELMCOMROWVEC ADDS A COMPLEX NUMBER TIMES A COMPLEX VECTOR TO A COMPLEX ROW VECTOR.
 34390 59 CHLSOL2 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY CHLDEC2 OR CHLDEC2COL2.
 34391 59 CHLSOL1 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY CHLDEC1 OR CHLDEC1COL1.
 34392 59 CHLDEC2COL2 SOLVES A POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD BE GIVEN IN THE UPPERTRIANGLE OF A TWO-DIMENSIONAL ARRAY.
 34393 59 CHLDEC1COL1 SOLVES A POSITIVE DEFINITE SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX SHOULD BE GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 34400 61 CHLINV2 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDEC2 OR CHLDEC2COL2.
 34401 61 CHLINV1 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX, IF THE MATRIX HAS BEEN DECOMPOSED BY CHLDEC1 OR CHLDEC1COL1.
 34402 61 CHLDECINV2 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A TWO-DIMENSIONAL ARRAY.
 34403 61 CHLDECINV1 CALCULATES THE INVERSE OF A POSITIVE DEFINITE SYMMETRIC MATRIX BY CHOLESKY'S SQUARE ROOT METHOD; THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 34410 39 LNGVECVEC CALCULATES THE SCALAR PRODUCT OF TWO VECTORS BY DOUBLE LENGTH ARITHMETIC.
 34411 39 LNGHATVEC CALCULATES THE SCALAR PRODUCT OF A VECTOR AND A ROW VECTOR BY DOUBLE PRECISION ARITHMETIC.
 34412 39 LNGTAVVEC CALCULATES THE SCALAR PRODUCT OF A VECTOR AND A COLUMN VECTOR BY DOUBLE PRECISION ARITHMETIC.
 34413 39 LNGHATHAT CALCULATES THE SCALAR PRODUCT OF A ROW OF A VECTOR AND A COLUMN VECTOR BY DOUBLE PRECISION ARITHMETIC.
 34414 39 LNGTAVHAT CALCULATES THE SCALAR PRODUCT OF TWO COLUMN VECTORS BY DOUBLE PRECISION ARITHMETIC.
 34415 39 LNGHATTAM CALCULATES THE SCALAR PRODUCT OF TWO ROW VECTORS BY DOUBLE PRECISION ARITHMETIC.
 34416 39 LNGSEQVEC CALCULATES THE SCALAR PRODUCT OF TWO VECTORS GIVEN IN ONE-DIMENSIONAL ARRAYS, WHERE THE MUTUAL SPACINGS BETWEEN THE INDICES OF THE 1ST VECTOR CHANGE LINEARLY, BY DOUBLE LENGTH ARITHMETIC.
 34417 39 LNGSCAPRO1 CALCULATES THE SCALAR PRODUCT OF TWO VECTORS GIVEN IN ONE-DIMENSIONAL ARRAYS, WHERE THE SPACINGS OF BOTH VECTORS ARE CONSTANT, BY DOUBLE PRECISION ARITHMETIC.
 34418 39 LNGSYHATVEC CALCULATES THE SCALAR PRODUCT OF A VECTOR GIVEN IN A ONE-DIMENSIONAL ARRAY AND A ROW OF A SYMMETRIC MATRIX, WHERE UPPER TRIANGLE IS STORED COLUMNWISE IN A ONE-DIMENSIONAL ARRAY, BY DOUBLE PRECISION ARITHMETIC.
 34420 91 DEC5YHTRI PERFORMS THE TRIANGULAR DECOMPOSITION OF A SYMMETRIC TRIANGULAR MATRIX.
 34421 93 SOL5YHTRI SOLVES A SYMMETRIC TRIANGULAR SYSTEM OF LINEAR EQUATIONS, THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 34422 93 DEC5OLS5YHTRI SOLVES A SYMMETRIC TRIANGULAR SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION.
 34423 81 DECTR1 PERFORMS A TRIANGULAR DECOMPOSITION OF A TRIANGULAR MATRIX.
 34424 83 SOLI1 SOLVES A TRIANGULAR SYSTEM OF LINEAR EQUATIONS THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 34425 83 DEC5OLTRI SOLVES A TRIANGULAR SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITHOUT PIVOTING.
 34426 81 DEGTIPIV PERFORMS A TRIANGULAR DECOMPOSITION OF A TRIANGULAR MATRIX, USING PARTIAL PIVOTING.
 34427 83 SULTIPIV SOLVES A TRIANGULAR SYSTEM OF LINEAR EQUATIONS THE TRIANGULAR DECOMPOSITION BEING GIVEN.
 34428 83 DEC5OLTRIPIV SOLVES A TRIANGULAR SYSTEM OF LINEAR EQUATIONS AND PERFORMS THE TRIANGULAR DECOMPOSITION WITH PARTIAL PIVOTING.
 34430 217 QJANEBND SOLVES A SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN (BEING A BAND MATRIX) IS GIVEN.
 34431 217 QJANEBND1 SOLVES A SYSTEM OF NON-LINEAR EQUATIONS OF WHICH THE JACOBIAN (BEING A BAND MATRIX) IS GIVEN.
 34432 239 PRAXIS MINIMIZES A FUNCTION OF SEVERAL VARIABLES.
 34433 235 MININ MINIMIZES A FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL.
 34435 237 MININR MINIMIZES A FUNCTION OF ONE VARIABLE IN A GIVEN INTERVAL, USING VALUES OF THE FUNCTION AND OF ITS DERIVATIVE.

- 34436 215 ZEROINRAT FINDS (IN A GIVEN INTERVAL) A ZERO OF A FUNCTION OF ONE VARIABLE.
 34437 213 JACOBNRF CALCULATES THE JACOBIAN MATRIX OF AN N-DIMENSIONAL FUNCTION OF N VARIABLES USING FORWARD DIFFERENCES.
 34438 213 JACOBRMF CALCULATES THE JACOBIAN MATRIX OF AN N-DIMENSIONAL FUNCTION OF M VARIABLES USING FORWARD DIFFERENCES.
 34439 213 JACOBNDMF CALCULATES THE JACOBIAN MATRIX OF AN N-DIMENSIONAL FUNCTION OF N VARIABLES, IF THE JACOBIAN IS KNOWN TO BE A BAND MATRIX.
 34440 219 MARQUAROT CALCULATES THE LEAST SQUARES SOLUTION OF AN OVERDETERMINED SYSTEM OF NON-LINEAR EQUATIONS WITH MARQUAROT'S METHOD.
 34441 219 GSSNEWTON CALCULATES THE LEAST SQUARES SOLUTION OF AN OVERDETERMINED SYSTEM OF NON-LINEAR EQUATIONS WITH THE GAUSS-NEWTON METHOD.
 34444 259 PEIDE ESTIMATES UNKNOWN PARAMETERS IN A SYSTEM OF 1ST ORDER DIFFERENTIAL EQUATIONS; THE UNKNOWN VARIABLES MAY APPEAR NON-LINEARLY BOTH IN THE DIFFERENTIAL EQUATIONS AND ITS INITIAL VALUES; A SET OF OBSERVED VALUES OF SOME COMPONENTS OF THE SOLUTION OF THE DIFFERENTIAL EQUATIONS MUST BE GIVEN.
 34453 233 ZEROINDER FINDS (IN A GIVEN INTERVAL) A ZERO OF A FUNCTION OF ONE VARIABLE USING VALUES OF THE FUNCTION AND OF ITS DERIVATIVE.
 34500 209 POLZEROS CALCULATES ALL ZEROS OF A POLYNOMIAL WITH REAL COEFFICIENTS.
 34600 267 QZIVAL COMPUTES GENERALIZED EIGENVALUES BY MEANS OF QZ-ITERATION.
 34601 267 QZI COMPUTES GENERALIZED EIGENVALUES AND EIGENVECTORS BY MEANS OF QZ-ITERATION.
 34602 267 HSHDECHUL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34603 267 HESTGL3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34604 267 HESTGL2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34605 267 HSH2COL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34606 267 HSH3COL IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34607 267 HSH2ROW3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34608 267 HSH2ROW2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34609 267 HSH3ROW3 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34610 267 HSH3ROW2 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF GENERALIZED EIGENVALUES.
 34611 277 CHSH2 FINDS A COMPLEX ROTATION MATRIX.
 34700 277 SYMDEC2 CALCULATES THE SYMMETRIC DECOMPOSITION OF A SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN IN A TWO-DIMENSIONAL ARRAY.
 34701 277 SYMDEC1 CALCULATES THE SYMMETRIC DECOMPOSITION OF A SYMMETRIC MATRIX WHOSE UPPER TRIANGLE IS GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 34702 279 SYMDETRM2 CALCULATES THE DETERMINANT A SYMMETRIC MATRIX, THE SYMMETRIC DECOMPOSITION BEING GIVEN IN A TWO-DIMENSIONAL ARRAY.
 34703 279 SYMDETRM1 CALCULATES THE DETERMINANT OF A SYMMETRIC MATRIX, THE SYMMETRIC DECOMPOSITION BEING GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 34704 281 SYMSOL2 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY SYMDEC2 OR SYMDECSOL2.
 34705 281 SYMSOL1 SOLVES A SYSTEM OF LINEAR EQUATIONS IF THE COEFFICIENT MATRIX HAS BEEN DECOMPOSED BY SYMDEC1 OR SYMDECSOL1.
 34706 261 SYMDECSOL2 SOLVES A SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX SHOULD BE GIVEN IN THE UPPER TRIANGLE OF A TWO-DIMENSIONAL ARRAY.
 34707 261 SYMDECSOL1 SOLVES A SYMMETRIC SYSTEM OF LINEAR EQUATIONS BY SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX SHOULD BE GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 34708 281 SYMIRV2 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC2 OR SYMDECSOL2.
 34709 283 SYMIRV1 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX, USING THE SYMMETRIC DECOMPOSITION FORMED BY SYMDEC1 OR SYMDECSOL1.
 34710 263 SYNDECINV2 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A TWO-DIMENSIONAL ARRAY.
 34711 263 SYNDECINV1 CALCULATES THE INVERSE OF A SYMMETRIC MATRIX BY A SYMMETRIC DECOMPOSITION (WITHOUT PIVOTING); THE COEFFICIENT MATRIX GIVEN COLUMNWISE IN A ONE-DIMENSIONAL ARRAY.
 35021 227 ERKORFUNCTION COMPUTES THE ERROR FUNCTION (ERF) AND COMPLEMENTARY ERROR FUNCTION (ERFC) FOR A REAL ARGUMENT.
 35022 227 WGNEXPERC COMPUTES $\text{ERFC}(X) * \text{EXP}(X)$.
 35023 227 INVERSE ERROR FUNCTION CALCULATES THE INVERSE ERROR FUNCTION $Y = \text{INVERF}(X)$.
 35027 227 FRESNEL CALCULATES THE FRESNEL INTEGRALS $C(X)$ AND $S(X)$.
 35028 227 FG IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF FRESNEL INTEGRALS.
 35030 187 INCOMGAM COMPUTES THE INCOMPLETE GAMMA FUNCTIONS.
 35050 187 INCBETA COMPUTES THE INCOMPLETE BETA-FUNCTION $I(X,P,Q)$; $0 \leq X \leq 1, P > 0, Q > 0$.
 35051 187 IBPLUSN COMPUTES INCOMPLETE BETA-FUNCTION RATIOS $I(X,P+N,Q)$ FOR $N = 0$ (I) NMAX, $0 \leq X \leq 1, P > 0, Q > 0$.
 35052 187 IBQPLUSN COMPUTES INCOMPLETE BETA-FUNCTION RATIOS $I(X,P,Q+N)$ FOR $N = 0$ (I) NMAX, $0 \leq X \leq 1, P > 0, Q > 0$.
 35053 187 IXQFIX IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF INCOMPLETE BESSELFUNCTIONS.
 35054 187 IXPFIX IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF INCOMPLETE BESSELFUNCTIONS.

3505b 187 BACKWARD IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF INCOMPLETE BESSELFUNCTIONS.
35060 187 RECIP GAMMA CALCULATES THE RECIPROCAL OF THE GAMMA FUNCTION FOR ARGUMENTS IN THE RANGE (.5,1.5); MOREOVER ODD AND EVEN PARTS ARE DELIVERED.

35061 187 GAMMA CALCULATES THE GAMMA FUNCTION.
35062 187 LOG GAMMA CALCULATES THE NATURAL LOGARITHM OF THE GAMMA FUNCTION FOR POSITIVE ARGUMENTS.
35060 183 EI CALCULATES THE EXPONENTIAL INTEGRAL.
35061 163 EI ALPHA CALCULATES A SEQUENCE OF INTEGRALS OF THE FORM INTEGRAL (EXP(-X)*T**N DT), FROM T=1 TO T-INFINITY.
35063 41 JFRAC CALCULATES A TERMINATING CONTINUED FRACTION.
35084 165 SINCOSINT CALCULATES THE SINE INTEGRAL SI(X) AND THE COSINE INTEGRAL CI(X).
35085 185 SINCOSFG IS AN AUXILIARY PROCEDURE FOR THE SINE AND COSINE INTEGRALS.
35086 163 ENX COMPUTES A SEQUENCE OF EXPONENTIAL INTEGRALS E(N,X) = THE INTEGRAL FROM 1 TO INFINITY OF EXP(-X * T) / T**N DT.
35067 183 NONEXP ENX COMPUTES A SEQUENCE OF INTEGRALS EXP(X) * E(N,X).
35111 181 SINH COMPUTES THE HYPERBOLIC SINE FOR A REAL ARGUMENT X.
35112 181 COSH COMPUTES THE HYPERBOLIC COSINE FOR A REAL ARGUMENT X.
35113 161 TANH COMPUTES THE HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
35114 181 ARCSINH COMPUTES THE INVERSE HYPERBOLIC SINE FOR A REAL ARGUMENT X.
35115 181 ARCCOSH COMPUTES THE INVERSE HYPERBOLIC COSINE FOR A REAL ARGUMENT X.
35116 181 ARCTANH COMPUTES THE INVERSE HYPERBOLIC TANGENT FOR A REAL ARGUMENT X.
35120 179 TAN COMPUTES THE TANGENT FOR A REAL ARGUMENT X.
35121 179 ARCSIN COMPUTES THE ARCSINE FOR A REAL ARGUMENT X.
35122 179 ARCCOS COMPUTES THE ARCCOSINE FOR A REAL ARGUMENT X.
35140 243 AIRY EVALUATES THE AIRY FUNCTIONS AI(Z) AND BI(Z) AND THEIR DERIVATIVES.
35145 243 AIRYZEROS COMPUTES THE ZEROS AND ASSOCIATED VALUES OF THE AIRY FUNCTIONS AI(Z) AND BI(Z) AND THEIR DERIVATIVES.
35150 247 SPHER BESS J CALCULATES THE SPHERICAL BESSEL FUNCTIONS OF THE 1ST KIND: J(K+.5)(X)*SQRT(PI/(2*X)), K=0,....,N , WHERE J(K+.5)(X) DENOTES THE BESSEL FUNCTION OF THE 1ST KIND OF ORDER K+.5.
35151 247 SPHER BESS Y CALCULATES THE SPHERICAL BESSEL FUNCTIONS OF THE 3RD KIND: Y(K+.5)(X)*SQRT(PI/(2*X)), K=0,....,N , WHERE Y(K+.5)(X) DENOTES THE BESSEL FUNCTION OF THE 3RD KIND OF ORDER K+.5.
35152 247 SPHER BESS I CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER K+.5.
35153 247 SPHER BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER K+.5.
35154 247 NONEXP SPHER BESS I CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER I+.5.
35155 247 NONEXP SPHER BESS K CALCULATES THE MODIFIED SPHERICAL BESSEL FUNCTIONS OF THE 3RD KIND MULTIPLIED BY EXP(+X);
35160 253 BESS J0 CALCULATES THE ORDINARY BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO.
35161 253 BESS J1 CALCULATES THE ORDINARY BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE.
35162 253 BESS J CALCULATES THE ORDINARY BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,....,N).
35163 253 BESS Y01 CALCULATES THE ORDINARY BESSEL FUNCTIONS OF THE 2ND KIND ORDER ZERO AND ONE WITH ARGUMENT X; X > 0.
35164 253 BESS Y CALCULATES THE ORDINARY BESSEL FUNCTIONS OF THE 2ND KIND OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X > 0.
35165 253 BESS P00 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF THE ORDINARY BESSEL FUNCTIONS OF ORDER ZERO FOR LARGE VALUES OF THEIR ARGUMENT.
35166 253 BESS P01 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF THE ORDINARY BESSEL FUNCTIONS OF ORDER ONE FOR LARGE VALUES OF THEIR ARGUMENT.
35170 255 BESS I0 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO.
35171 255 BESS I1 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE.
35172 255 BESS I CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,....,N).
35173 255 BESS K01 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDERS ZERO AND ONE WITH ARGUMENT X, X > 0.
35174 255 BESS K CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER L (L = 0,....,N) WITH ARGUMENT X, X > 0.
35175 255 NONEXP BESS I0 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ZERO; THE RESULT IS MULTIPLIED BY EXP(-ABS(X)).
35176 255 NONEXP BESS I1 CALCULATES THE MODIFIED BESSEL FUNCTION OF THE 1ST KIND OF ORDER ONE; THE RESULT IS MULTIPLIED BY EXP(-ABS(X))
35177 255 NONEXP BESS I CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER L (L = 0,....,N); THE RESULT IS MULTIPLIED BY EXP(-ABS(X)).

- 35178 255 HONEXP BESS K01 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER ZERO AND ONE WITH ARGUMENT X, X>0; THE RESULT IS MULTIPLIED BY EXP(X).
- 35179 255 HONEXP BESS K CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER L (L = 0, ..., N) WITH ARGUMENT X, X>0; THE RESULT IS MULTIPLIED BY EXP(X).
- 35180 249 BESS JAPLUSN CALCULATES THE BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER A+K (0<=K<=N, 0<=A<1).
- 35181 249 BESS YA01 CALCULATES THE BESSEL FUNCTIONS OF THE 2ND KIND (ALSO CALLED NEUMANN'S FUNCTIONS) OF ORDER A AND A+1 (A>=0) AND ARGUMENT X>0.
- 35182 249 BESS YAPLUSN CALCULATES THE BESSEL FUNCTIONS OF THE 2ND KIND OF ORDER A+N, N=0, ..., NMAX, A>=0, AND ARGUMENT X>0.
- 35183 249 BESS PQA01 IS AN AUXILIARY PROCEDURE FOR THE COMPUTATION OF THE BESSEL FUNCTIONS FOR LARGE VALUES OF THEIR ARGUMENT.
- 35190 251 BESS IAPLUSN CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER A+N, N=0, ..., NMAX, A>=0 AND ARGUMENT X>=0.
- 35191 251 BESS KA01 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A AND A+1, A>=0, AND ARGUMENT X, X>0.
- 35192 251 BESS KAPLUSN CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A+N, N=0, ..., NMAX, A>=0, AND ARGUMENT X>0.
- 35193 251 HONEXP BESS IAPLUSN CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 1ST KIND OF ORDER A+N, N=0, ..., NMAX, A>=0 AND ARGUMENT X>=0, MULTIPLIED BY EXP(-X).
- 35194 251 HONEXP BESS KA01 CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A AND A+1, A>=0 AND ARGUMENT X, X>0, MULTIPLIED BY THE FACTOR EXP(X).
- 35195 251 HONEXP BESS KAPLUSN CALCULATES THE MODIFIED BESSEL FUNCTIONS OF THE 3RD KIND OF ORDER A+N, N=0, ..., NMAX, A>=0 AND ARGUMENT X>0, MULTIPLIED BY THE FACTOR EXP(X).
- 36010 195 NEWTON CALCULATES THE COEFFICIENTS OF THE NEWTON POLYNOMIAL THROUGH GIVEN INTERPOLATION POINTS AND CORRESPONDING FUNCTION VALUES.
- 36020 197 INI SELECTS A (SUB)SET OF INTEGERS OUT OF A GIVEN SET OF INTEGERS; IT IS AN AUXILIARY PROCEDURE FOR MINMAXPOL.
- 36021 197 SVDREHEZ EXCHANGES AT MOST N+1 NUMBERS WITH NUMBERS OUT OF A REFERENCE SET; IT IS AN AUXILIARY PROCEDURE FOR MINMAXPOL.
- 36022 197 MINMAXPOL CALCULATES THE COEFFICIENTS OF THE POLYNOMIAL THAT APPROXIMATES A FUNCTION, GIVEN FOR DISCRETE ARGUMENTS, SUCH THAT THE INFINITY NORM OF THE ERROR VECTOR IS MINIMISED.