

## ADAS Subroutine xxeign

SUBROUTINE XXEIGN(A, IA, N, RR, RI, VR, VI, IV1, FV1, IERR)

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C  
C ROUTINE: XXEIGN  
C  
C PURPOSE: FINDS THE EIGENVALUES AND EIGENVECTORS OF A GENERAL REAL  
C MATRIX.  
C  
C REPLACES NAG ROUTINE F02AGF ALTHOUGH THERE ARE SEVERAL  
C DIFFERENCES - YOU SHOULD COMPARE THE DOCUMENTATION. THIS  
C IS A FRONT-END TO THE NETLIB LIBRARY PROGRAM RG.F WHICH  
C FOLLOWS TOGETHER WITH ALL ITS DEPENDENCIES.  
C  
C \*\*\* N.B. THE EIGENVECTORS ARE NOT NORMALIZED TO UNIT LENGTH \*\*\*  
C  
C CALLING PROGRAM: GENERAL USE  
C  
C INPUT:  
C  
C (R\*8) A(,) CONTAINS THE REAL GENERAL MATRIX.  
C  
C (I\*4) IA THE ROW DIMENSION OF THE TWO-DIMENSIONAL  
C ARRAY PARAMETERS AS DECLARED IN THE CALLING  
C PROGRAM DIMENSION STATEMENT.  
C  
C (I\*4) N THE ORDER OF THE MATRIX A.  
C (I\*4) IV1( ) WORK ARRAY, DIMENSION = N.  
C (R\*4) FV1( ) WORK ARRAY, DIMENSION = N.  
C  
C OUTPUT:  
C  
C (R\*8) RR( ) REAL PART OF THE EIGENVALUES  
C (R\*8) RI( ) IMAGINARY PART OF EIGENVALUES  
C COMPLEX CONJUGATE PAIRS OF EIGENVALUES APPEAR  
C CONSECUTIVELY WITH THE EIGENVALUE HAVING THE  
C POSITIVE IMAGINARY PART FIRST.  
C  
C (R\*8) VR(,) REAL PARTS OF THE EIGENVECTORS. FIRST DIMENSION  
C = IA.  
C THE REAL PART OF THE EIGENVECTOR CORRESPONDING TO  
C THE I-TH EIGENVALUE IS IN VR(J,I), J=1...N  
C (R\*8) VI(,) IMAGINARY PARTS OF THE EIGENVECTORS. FIRST  
C DIMENSION = IA  
C THE IMAGINARY PART OF THE EIGENVECTOR  
C CORRESPONDING TO THE I-TH EIGENVALUE IS IN  
C VR(J,I), J=1...N  
C (I\*4) IERR AN ERROR CODE SET TO ZERO IF NO ERROR. SEE HRQ AND  
C HRQ2 FOR A DESCRIPTION OF THIS VARIABLE  
C  
C ROUTINES:  
C-----  
C NAME SOURCE PURPOSE

C-----  
C      RG           NETLIB      CALCULATES THE EIGENVALUES AND EIGENVECTORS  
C      DPMPAR      ADAS/NETLIB    RETURNS MACHINE DEPENDANT PARAMETERS  
C-----

C  
C AUTHOR: WILLIAM OSBORN (TESSELLA SUPPORT SERVICES PLC.)  
C

C DATE:    10/06/96  
C

C VERSION 1.1    DATE: 10/06/96

C MODIFIED: WILLIAM OSBORN

C           - FIRST VERSION

C VERSION: 1.2            DATE:27/06/96

C MODIFIED: WILLIAM OSBORN

C           - REMOVED UNUSED VARIABLES  
C

C VERSION: 1.3            DATE:27/06/96

C MODIFIED: WILLIAM OSBORN

C           - ADDED PDONE VARIABLE TO ELIMINATE THE NEED FOR ASSIGNMENT  
C                                TO A DO-LOOP COUNTER.  
C

C VERSION: 1.4            DATE:17/05/07

C MODIFIED: Allan Whiteford

C           - Updated comments as part of subroutine documentation  
C                                procedure.  
C

C-----  
C  
C            INTEGER                    IA,                    IERR,                    IV1 (N) ,            N  
C            REAL\*8                    A ( IA, N) ,            FV1 ( N) ,            RI ( N) ,            RR ( N)  
C            REAL\*8                    VI ( IA, N) ,            VR ( IA, N)  
C            DOUBLE PRECISION          A ( NM, N) ,            FV1 ( N) ,            WI ( N) ,            WR ( N)  
C            DOUBLE PRECISION          Z ( NM, N)  
C            INTEGER                    IERR,                    IV1 ( N) ,            MATZ,                N  
C            INTEGER                    NM  
C            DOUBLE PRECISION          A ( NM, N) ,            SCALE ( N)  
C            INTEGER                    IGH,                    LOW,                    N,                    NM  
C            DOUBLE PRECISION          SCALE ( N) ,            Z ( NM, M)  
C            INTEGER                    IGH,                    LOW,                    M,                    N  
C            INTEGER                    NM  
C            DOUBLE PRECISION          AI,                    AR,                    BI,                    BR  
C            DOUBLE PRECISION          CI,                    CR  
C            DOUBLE PRECISION          A ( NM, N)  
C            INTEGER                    IGH,                    INT ( IGH) ,            LOW,                    N  
C            INTEGER                    NM  
C            DOUBLE PRECISION          A ( NM, IGH) ,            Z ( NM, N)  
C            INTEGER                    IGH,                    INT ( IGH) ,            LOW,                    N  
C            INTEGER                    NM  
C            DOUBLE PRECISION          H ( NM, N) ,            WI ( N) ,            WR ( N)  
C            INTEGER                    IERR,                    IGH,                    LOW,                    N  
C            INTEGER                    NM  
C            DOUBLE PRECISION          H ( NM, N) ,            WI ( N) ,            WR ( N) ,            Z ( NM, N)  
C            INTEGER                    IERR,                    IGH,                    LOW,                    N

INTEGER

NM