

ADAS Subroutine xxminv

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SUBROUTINE XXMINV( LSOLVE , NDMAX , NDIM ,  
&                A      , B      , DINT  
&                )
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C-----  
C  
C ***** FORTRAN77 SUBROUTINE: XXMINV *****  
C  
C PURPOSE: MATRIX INVERSION WITH ACCOMPANYING SOLUTION OF LINEAR  
C          EQUATIONS IF REQUESTED.  
C  
C CALLING PROGRAM: GENERAL USE  
C  
C SUBROUTINE:  
C  
C INPUT : (L*4)  LSOLVE   = .TRUE.  => SOLVES SET OF 'N' LINEAR  
C                                     EQUATIONS  $A.X = B$ , WHERE A,X,B  
C                                     ARE MATRICES/VECTORS AND:  
C                                     A = 'A(,)' ON INPUT  
C                                     X = 'B()' ON OUTPUT  
C                                     B = 'B()' ON INPUT  
C                                     .FALSE. => DOES NOT SOLVE ANY EQUATIONS  
C                                     AND 'B()' IS NOT USED.  
C  
C INPUT : (I*4)  NDMAX    = MAXIMUM VALUE OF 'N' ALLOWED. I.E.  
C                                     PHYSICAL DIMENSION OF INPUT MATRICES.  
C INPUT : (I*4)  NDIM     = DIMENSIONALITY 'N' OF MATRIX/EQUATIONS  
C                                     TO BE SOLVED.  
C  
C I/O   : (R*8)  A(, )    = 'N' BY 'N' MATRIX  
C                                     INPUT : MATRIX TO BE INVERTED  
C                                     OUTPUT: INVERTED MATRIX  
C I/O   : (R*8)  B()      = USED ONLY IF 'LSOLVE=.TRUE.' WHEN THE SET  
C                                     OF 'N' LINEAR EQUATIONS ARE TO BE SOLVED.  
C                                      $A.X = B$   
C                                     INPUT : RIGHT HAND SIDE VECTOR 'B'  
C                                     OUTPUT: SOLUTION VECTOR 'X'  
C  
C OUTPUT: (R*8)  DINT     = +1 OR -1 DEPENDING ON WHETHER THE NUMBER  
C                                     OF ROW INTERCHANGES WAS EVEN OR ODD,  
C                                     RESPECTIVELY.  
C  
C          (I*4)  NLMAX    = PARAMETER: MUST BE  $\geq$  'NDMAX'  
C  
C          (I*4)  LROW     = ROW OF INPUT 'A(*,)' CONTAINING LARGEST  
C                                     NON-ZERO ELEMENT.  
C          (I*4)  LCOLUM   = COLUMN OF INPUT 'A(,*)' CONTAINING LARGEST  
C                                     NON-ZERO ELEMENT.  
C                                     'LROW' & 'LCOLUM' => PIVOT POSITION IN A(,)  
C          (I*4)  I1       = ARRAY INDICES: 1ST LEVEL  
C          (I*4)  I2       = ARRAY INDICES: 2ND LEVEL
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C          (I*4)  I3          = ARRAY INDICES: 3RD LEVEL
C
C          (R*8)  DMAX        = LARGEST NON-ZERO ELEMENT OF 'A(,)',
C                          AND EQUALS 'ABS(A(LROW,LCOLUM))'
C          (R*8)  SWAP        = TEMPORARAY STORAGE WHEN INTERCHANGING
C                          ROWS/COLUMNS.
C          (R*8)  TVAL        = TEMPORARY STORAGE OF VALUES IN NON-PIVOT
C                          ROWS.
C
C          (I*4)  IPIVOT()    = NUMBER OF TIMES PIVOT FOUND IN COLUMN
C                          DIMENSION: COLUMN INDEX
C          (I*4)  INDX(,1)    = ROW OF PIVOT IN 'A(,)'
C                          DIMENSION: PIVOT INDEX
C          (I*4)  INDX(,2)    = COLUMN OF PIVOT IN 'A(,)'
C                          DIMENSION: PIVOT INDEX
C
C          (R*8)  PIVOT()     = 'DMAX' FOR PIVOT: DIMENSION PIVOT INDEX
C
C
C ROUTINES: NONE
C
C NOTE: THIS IS A STRUCTURED VERSION OF THE SUBROUTINE 'MATINV' WRITTEN
C       BY HUGH SUMMERS.
C
C AUTHOR:  PAUL E. BRIDEN (TESSELLA SUPPORT SERVICES PLC)
C          K1/0/81
C          JET EXT. 4569
C
C DATE:    31/08/90
C
C UPDATE:  15/05/92 - PE BRIDEN - INCREASED NLMAX FROM 50 -> 75
C
C UPDATE:  26/06/92 - PE BRIDEN - INCREASED NLMAX FROM 75 -> 200
C
C VERSION: 1.2 DATE: 04-05-2000
C MODIFIED: RICHARD MARTIN
C CHANGED DOCUMENTATION FOR NDIM.
C
C VERSION   : 1.3
C DATE      : 20-12-2001
C MODIFIED  : Martin O'Mullane
C           - Removed mainframe listing information beyond column 72.
C
C VERSION: 1.4                                DATE: 02-03-2003
C MODIFIED: Martin O'Mullane & Allan Whiteford
C - Increased NLMAX to 801 and improved error message.
C
C VERSION: 1.5                                DATE: 29-05-2003
C MODIFIED: Martin O'Mullane
C - Increased NLMAX to 1201.
C
C-----
C-----

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INTEGER          NDIM,          NDMAX
LOGICAL          LSOLVE
REAL*8          A (NDMAX, NDMAX) ,          B (NDMAX) ,          DINT
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