```
!jInvert_Demo.f95
!2026.04.19.1605cdt-    Demonstrates calling jInvert()

!    Author- Jeffrey M. Setterholm, Lakeville,MN 55044 USA
! IP Status- Free source code (e.g.: post copyright)
!
!  Computer- "T4"/HP-800-G4-Mini/i7-8700T/IntelUHD630/Win10Pro-22H2
!             ^name  ^Mfgr.Id    ^chipset ^graphics   ^OS
!                /AbsoftProFortran 21.0.2/OpenGL+Glut3.6
!                 ^compiler              ^Fortran graphics
!Disclaimer:
! ************************************************************
! **********   Individual cognition is always flawed,  **********
! **********         including yours and mine.         **********
! **********                  - So: -                  **********
! ********** Use this code & program at your own risk. **********
! ************************************************************

!Table of Contents: ...use to search...
!Program jInvert_Demo !Demonstrates calling jInvert                          @ 25

!       "jInvert_Demo-f95.pdf" has the color-coded Fortran syntax.
!-------------------------------------------------------------------------------

Program jInvert_Demo
!Exercises Subroutine jInvert(Nin,C,iRW,iP) ...after defining Nin,C, iRW, & iP.
!--Globals
 use jInvert_FoR & !The "Frame-of-Reference" of jInvert(), i.e.: the variables
                ,only:  DataFileIn, DataFileOut, YourDataHeader  &
                      , iP, iRW, Nin, C, iRankin, iRankOut
 !--End Globals
 implicit none
 !--Arguments
 !--Internals                <- locally defined variables:
  logical(4):: LExists       !File existence flag
  integer(4):: iAlloc        !Array allocation flag =0:success
  integer(4):: i,j,i2,j2

  !--EndDefs-----------------------------------------------
   write( 6, "(/'!{Program jInvert_Demo:',45('-')&
                    &,t58,' jInvert_Demo.f95 @ 40')")
   pause"Use this program at your own risk. Press enter to continue."
   iP  = 13
   iRW = 14
  !--Read "jInvert-Filenames.ini":
   inquire(file="jInvert-Filenames.ini",exist=LExists)
   if(LExists)then
     open( unit=iRW, file="jInvert-Filenames.ini"   , action='read'    &
                   , access='sequential', status='old' ,err=25)

       read(iRW,*,err= 5) DataFileIn ; write( 0,*) DataFileIn          ;goto 10
 5     write( 6,*) "Error reading line 1 of jInvert-Filenames.ini"
10     read(iRW,*,err=15) DataFileOut; write( 0,*) DataFileOut         ;goto 20
15     write( 6,*) "Error reading line 2 of jInvert-Filenames.ini"
20   close(iRW)                                                        ;goto 30
   endif!(LExists)
25 write( 6,*) "jInvert-Filenames.ini not found. Using defaults."

  !--Open DataFileOut:
30 write(6,"('jInvert: DataFileOut     = ',:,79a1)") &
                    (DataFileOut(i:i),i=1,len_trim(DataFileOut))

   open(unit=iP,file=DataFileOut,action='write',err=35); goto 40
35 iP= 6;write(iP,"( 'The file could not be opened for write. Using screen.')")

  !--Read DataFileIn:
40 write(iP,"(/'jInvert_Demo: reading ',:,79a1)") &
                           (DataFileIn(i:i),i=1,len_trim(DataFileIn))
   inquire(file=DataFileIn,exist=LExists)
```

```
70     if(LExists)then
71       open( unit=iRW, file=DataFileIn    , action='read'    &
72                     , access='sequential', status='old' ,err=75)
73         read(iRW,*,err=55) YourDataHeader ; write(iP,*) YourDataHeader  ;goto 60
74   55    write(iP,*) "Error reading line 1 of DataFileIn"
75   60    read(iRW,*,err=65) Nin ; write(iP,"(i7,', : Nin')") Nin         ;goto 70
76   65    write(iP,*) "Error reading line 2 of DataFileIn"
77   70    read(iRW,*,err=75) iRankIn
78                       write(iP,"(i7,', : iRankIn   ignored.')")iRankIn ;goto 80
79   75    write(iP,*) "Error reading line 3 of DataFileIn"
80
81   80    allocate(C(Nin,Nin),stat=iAlloc)
82         if(iAlloc.ne.0) then; Pause &
83           'jInvert_Demo: C(Nin,Nin) allocation error. Will halt. Press enter'
84           Stop '@ 105'
85         endif!(iAlloc.ne.0)
86         C = ( 0._16, 0._16 )  !clears the allocated complex matrix.
87       do i = 1,Nin; do j = 1,Nin
88         read(iRW,*,err=85) i2,j2, C(i2,j2)
89         write(iP,"(2(i3,','),sp,' (',e38.30,',',e38.30,'),')") &
90                         i2,j2,                C(i2,j2)
91       enddo        ;enddo                                              ;goto 90
92   85   write(iP,*) "Error reading the complex matrix coefficients"
93
94   90   close(iRW)                                                      ;goto 100
95     endif!(LExists)
96     write(iP,*) "DataFileIn not found. Using defaults."
97
98    !Call jInvert():
99   100 call jInvert(Nin,C,iRankOut,iRW,iP)
100
101    write(iP,"( 'jCinverse:')")
102    write(iP,*) YourDataHeader
103    write(iP,"(i7,', : Nin')") Nin
104    write(iP,"(i7,', : iRankOut')")iRankOut
105
106    do i = 1,Nin; do j = 1,Nin
107      write(iP,"(2(i3,','),sp,' (',e38.30,',',e38.30,'),')") &
108                    i,j,                  C(i,j)
109    enddo        ;enddo
110
111    if(allocated(C)) deallocate(C)
112    write(iP,"('  Program jInvert_Demo}',16x,' [deallocated]'&
113                                                  &,t70,' Done @113',/)")
114    if(iP>6) close(iP)
115  End Program jInvert_Demo
116  !-------------------------------------------------------------------------------
117
```