```
c-------------------------------------------------------------
c     Returns a double precision vector (one-dimensional
c     array) read from file 'fname'.  If 'fname' is the
c     string '-', the vector is read from standard input.
c
c     The file should contain one number per line; invalid
c     input is ignored.
c
c     This routine illustrates  a general technique for
c     reading data from a FORMATTED (ASCII) file.  In
c     Fortran, one associates a "logical unit number"
c     (an integer) with a file via the OPEN statement.
c     The unit number can then be used as the first
c     "argument" of the READ and WRITE statements to
c     perform input and output on the file.
c
c     Fortran reserves the following unit numbers:
c
c     5      terminal input (stdin)
c     6      terminal output (stdin)
c     0      error output on Unix systems (stderr)
c-------------------------------------------------------------

      subroutine dvfrom(fname,v,n,maxn)
c-------------------------------------------------------------
c     Arguments:
c
c        fname:  (I)    File name
c        v:      (O)    Return vector
c        n:      (O)    Length of v (# read)
c        maxn:   (I)    Maximum number to read
c-------------------------------------------------------------
         implicit         none
c-------------------------------------------------------------
c        The integer functions 'indlnb' and 'getu' are
c        defined in the 'p329f' library.
c-------------------------------------------------------------
         integer          indlnb,      getu
```

```
c-------------------------------------------------------------
c       Declaration of routine arguments: note
c       "adjustable dimensioning" of v; any array which
c       is declared with adjustable dimesions must be
c       a subroutine argument; any adjustable dimensions
c       must also be subroutine arguments.
c-------------------------------------------------------------
        character*(*)    fname
        integer          n,            maxn
        real*8           v(maxn)
c-------------------------------------------------------------
c       Programming style: Use parameter (ustdin) rather
c       than constant value (5) for stdin logical unit #
c-------------------------------------------------------------
        integer          ustdin
        parameter      ( ustdin = 5 )
c-------------------------------------------------------------
c       Local variables:
c
c       vn:     Current number read from input
c       ufrom:  Logical unit number for READ
c       rc:     For storing return status from READ
c-------------------------------------------------------------
        real*8           vn
        integer          ufrom,        rc
c-------------------------------------------------------------
c       Intialize
c-------------------------------------------------------------
        n = 0
c-------------------------------------------------------------
c       Read from stdin?
c-------------------------------------------------------------
        if( fname .eq. '-' ) then
c-------------------------------------------------------------
c          Set unit number to stdin default
c-------------------------------------------------------------
           ufrom = ustdin
        else
```

```
c-----------------------------------------------------------
c           Get an available unit number
c-----------------------------------------------------------
            ufrom = getu()
c-----------------------------------------------------------
c           Open the file for formatted I/O
c-----------------------------------------------------------
            open(ufrom,file=fname(1:indlnb(fname)),
     &           form='formatted',iostat=rc)
            if( rc .ne. 0 ) then
c-----------------------------------------------------------
c              Couldn't open the file, print error message
c              and return.
c-----------------------------------------------------------
               write(0,*) 'dvfrom: Error opening ',
     &                    fname(1:indlnb(fname))
               return
            end if
         end if

c-----------------------------------------------------------
c        Input numbers into vector (one per line) until
c        EOF or maximum allowable number read
c-----------------------------------------------------------
 100     continue
            read(ufrom,*,iostat=rc,end=200)  vn
            if( rc .eq. 0 ) then
               n = n + 1
               if( n .gt. maxn ) then
                  write(0,*)  'dvfrom: Read maximum of ',
     &                        maxn, ' from ',
     &                        fname(1:indlnb(fname))
                     n = maxn
                     return
               end if
               v(n) = vn
            end if
         go to 100
 200     continue
```

```
c------------------------------------------------------------
c        If we are reading from a file, close the file.
c        This releases the unit number for subsequent use.
c------------------------------------------------------------
         if( ufrom .ne. ustdin ) then
            close(ufrom)
         end if

         return

      end
```

```
c-----------------------------------------------------------
c     Test program for subroutine 'dvfrom'.
c
c     Program expects one argument which is the filename
c     to be passed to 'dvfrom'
c-----------------------------------------------------------
      program         tdvfrom

      implicit        none

c-----------------------------------------------------------
c     The integer function 'iargc' returns the number of
c     arguments supplied to the program.  It is
c     automatically available to all Fortran programs on
c     most Unix systems, as is 'getarg' (see below).
c-----------------------------------------------------------
      integer         iargc,      indlnb

      integer         maxn
      parameter     ( maxn = 100 000 )
      real*8          v(maxn)
      integer         n

      character*256   fname

c-----------------------------------------------------------
c     Unless exactly one argument is supplied, print usage
c     message and exit.
c-----------------------------------------------------------
      if( iargc() .ne. 1 ) then
         write(0,*) 'usage: tdvfrom <file name>'
         write(0,*)
         write(0,*) '       Use ''tdvfrom -'' to read ',
     &              'from standard input'
         stop
      end if
```

```
c-----------------------------------------------------------
c     The subroutine 'getarg' (Unix) takes 2 arguments.
c     The first is an integer input argument specifying
c     which argument is to be fetched, the second is
c     a character output argument which, on return,
c     contains the fetched argument.
c
c     Get the filename.
c-----------------------------------------------------------
      call getarg(1,fname)
c-----------------------------------------------------------
c     Call the routine ...
c-----------------------------------------------------------
      call dvfrom(fname,v,n,maxn)
c-----------------------------------------------------------
c     ... and report how many numbers were read.
c-----------------------------------------------------------
      write(0,*) 'tdvfrom: ', n, ' read from '//
     &           fname(1:indlnb(fname))

      stop
      end
```

```
##############################################################
#     Examples of 'tdvfrom' (tests 'dvfrom')
##############################################################
gauss 21> tdvfrom
 usage: tdvfrom <file name>

        Use 'tdvfrom -' to read from standard input

gauss 22> tdvfrom -
1
2
3
4
5
^D
 tdvfrom:            5 read from -

gauss 23> tdvfrom < first100
 tdvfrom:          100 read from first100
```