```fortran
        program example_io

c An example Fortran code showing the way
c to input and output SAC data
c 2010/05/09 T. Shibutani

        parameter (max = 10000)

        character aline*80
        character kname1*80, kname2*80
        real wdat(max), fdat(max)

        write(6, '("Input SAC file name to read: ",$)')
        read(5, '(a)') aline
        lw = len_trim(aline)
        write(kname1, '(a, a1)') aline(1:lw),
     &   char(0)

        call rsac1(kname1, wdat, nlen, beg,
     &   del, max, nerr)
        write(6, *) 'npts =', nlen
        write(6, *) 'b =', beg
        write(6, *) 'delta =', del

c       call getnhv('nzyear', iyear, nerr)
c       call getnhv('nzjday', jday, nerr)
c       call getnhv('nzhour', ihour, nerr)
c       call getnhv('nzmin', minute, nerr)
c       call getnhv('nzsec', isec, nerr)
c       call getnhv('nzmsec', msec, nerr)

        write(6, '("Input time range (t1, t2): ",$)')
        read(5, *) t1, t2
        n1 = int((t1 - beg) / del) + 1
        n2 = int((t2 - beg) / del) + 1
```

```fortran
        npts = n2 - n1 + 1

        do i = 1, npts
           fdat(i) = wdat(n1 + i - 1)
        end do

        write(6, '("Input SAC file name to write: ", $)')
        read(5, '(a)') aline
        lw = len_trim(aline)
        write(kname2, '(a, a1)') aline(1:lw),
     &   char(0)

        call newhdr
        call setnhv('npts', npts, nerr)
        call setihv('iftype', 'itime', nerr)
        call setlhv('leven', .true., nerr)
        call setfhv('delta', del, nerr)
c       call setnhv('iztype', 'io', nerr)
c       call setnhv('nzyear', iyear, nerr)
c       call setnhv('nzjday', jday, nerr)
c       call setnhv('nzhour', ihour, nerr)
c       call setnhv('nzmin', minute, nerr)
c       call setnhv('nzsec', isec, nerr)
c       call setnhv('nzmsec', msec, nerr)
        call setfhv('b', t1, nerr)
c       call setihv('idep', 'ivel', nerr)
c       call setfhv('cmpaz', 0.0, nerr)
c       call setfhv('cmpinc', 0.0, nerr)
        call wsac0(kname2, xdum, fdat, nerr)

        stop
        end
```

```
*** macro1: transfer, decimate and rotate
*** 2010/02/17, T. Shibutani

bd x
qdp off
cut off
*xlim off
xlim a -150 150

setbb fu (reply "Enter file name @(ex. wav1.K
S23.U@): ")
setbb ff (subs 1 9 %fu% )

r %fu
rmean
p
pause
trans from polezero subtype KS23_U.zp to none
 freq 0.02 0.05 5.0 10.0
dec 5
p
pause
setbb gu (cha 'wav1' 'wav2' %fu% )
w %gu

setbb fn (conc %ff '.N' )
r %fn
rmean
p
pause
trans from polezero subtype KS23_N.zp to none
 freq 0.02 0.05 5.0 10.0
dec 5
p
pause
```

```
setbb gn (cha 'wav1' 'wav2' %fn% )
w %gn

setbb fe (conc %ff '.E' )
r %fe
rmean
p
pause
trans from polezero subtype KS23_E.zp to none
 freq 0.02 0.05 5.0 10.0
dec 5
p
pause
setbb ge (cha 'wav1' 'wav2' %fe% )
w %ge

r %gn %ge
rot to gcp
p1
pause
setbb gg (subs 1 9 %gu% )
setbb gr (conc %gg '.R' )
setbb gt (conc %gg '.T' )
w %gr %gt

r %gr
ch kcmpnm R
w over
r %gt
ch kcmpnm T
w over

r %gu %gn %ge %gr %gt
p1
```