18.330 PREcursor (!) to Prob 36 Fri 30 Apr 04

Here is an end-of-term gift meant to assist you in your struggles with that resistor cube from Problem 36 yet more explicitly than via my old program **QUICK** that I already appended as a postscript to our 2-D resistor mesh from Problem 30. You are most welcome to employ this aptly named **QUICK3** as a part of your own solution ... but, if so, only with the polite requirement that you include signs that you had at least to some extent actually comprehended and also goof-tested its marvelously rapid workings!

AT

Program QUICK3

```
      implicit double precision (a-h,o-z)

      dimension S2(0:99), WT(0:99)


      pi = 4 * atan(1.0d0)


      do 59 Nsize=2,100

        do 19 i=0,Nsize-1
          arg = pi * i / (2.0d0 * Nsize)
          S2(i) = sin(arg) * sin(arg)
          WT(i) = 2 * cos(arg) * cos(arg) / Nsize
19      continue

        WT(0) = 1.0d0 / Nsize

c ... Here  4 * S2(i)  supplies 1-D eigenVALUES like  0,1,3  for  Nsize=3 ,
c     or  0, 2-sqrt(2), 2, and 2+sqrt(2)  for  Nsize=4 , whereas  WT(i)
c     reports the square of the vital first (or last) element of each
c     corresponding  1-D  eigenVECTOR, now already divided by the sum
c     ssq = Nsize or Nsize/2  of the squares of all of its components.

        Rohms = 0

        do 49 K=0,Nsize-1
          do 39 L=0,Nsize-1
            do 29 M=0,Nsize-1

              KLM = K + L + M
              if (KLM.eq.2*(KLM/2)) go to 29

c ... Yes, SKIP any composite  K,L,M  eigenvector for which the index
c     sum  K+L+M = even ,  since its first and last components would
c     be identical, and it would contribute nothing to the sum below.

              Wcomp = WT(K) * WT(L) * WT(M)
              eigen = S2(K) + S2(L) + S2(M)

              Rplus = Wcomp / eigen
              Rohms = Rohms + Rplus

              if (Nsize.eq.4) then
                write (*,25) K,L,M, Wcomp, eigen, Rplus, Rohms
25              format (10x, 3i5, 3x, 4f12.6)
              endif

29          continue
39        continue
49      continue

        write (*,55) Nsize, Rohms
55      format (20x, 'Nsize =', i6, 5x, 'Rohms =', f20.15)

59    continue


      end
```