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PROGRAM newx
*****
* Lumps and interpolates an x-ordered x-y file. *
* From standard input it reads: *
* input file name *
* filename containing array of x-values to used on output *
* The resulting x y file flushed to standard output. *
* It interpolates linearly over data-points around the output x-values.*
* Points that fall outside the available data-set are omitted. *
* If the new grid is actually smaller than the original one, *
* or if some datapoints are missing, a linear interpolation is made *
* between the two neighboring original data-points. *
*****
parameter(nphys=100000)
real eps,sx,sy,sxx,sxy,x,y,xx(nphys),yy(nphys)
* ,xmx,xmn,xlast,xnext,ylast,ynext,wlow,whigh
* ,a,b,xnw(nphys),ynw(nphys),tmx,tmn
CHARACTER*40 flin,flix
INTEGER I,J,n,mm,nn,ilast

read(*,'(a40)') flin
read(*,'(a40)') flix
open(23,FILE=flin)
mm=100000
xmx=-1e20
xmn=1e20
do 10 i=1,mm
  READ(23,*,END=11) xx(i),yy(i)
  if (xx(i).lt.xmn) xmn=xx(i)
  if (xx(i).gt.xmx) xmx=xx(i)
10 continue
11 mm=i-1
close(23)

open(24,FILE=flix)
nn=100000
do 20 i=1,nn
  READ(24,*,END=21) xnw(i)
20 continue
21 nn=i-1
close(24)

*****lump to tsp intervals
ilast=1
eps=1e-8
do 31 i=1,nn
  if (i.le.(nn-1)) then
    tmx=xnw(i+1)
  else
    tmx=xnw(i)
  endif
  if (i.ge.2) then
    tmn=xnw(i-1)
  else
    tmn=xnw(i)
  endif
  sy=0
  sx=0

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    sxy=0
    sxx=0
    n=0
    do 200 j=ilast,mm
if (xx(j).lt.tmn) goto 200
    if (xx(j).ge.tmx) goto 210
    sy=sy+yy(j)
    sx=sx+xx(j)
    n=n+1
    sxy=sxy+xx(j)*yy(j)
    sxx=sxx+xx(j)*xx(j)
200    continue
210    ilast=j
    if (n.eq.0) then
***** first omit all points that are outside interval
        if ((xnw(i).lt.xmn).or.(xnw(i).gt.xmx)) then
            y=1
***** otherwise take appropriate weighted average between
***** last point and first subsequent point
        else
            xlast=xx(ilast-1)
            xnext=xx(ilast)
            ylast=yy(ilast-1)
            ynext=yy(ilast)
            whigh=(xnw(i)-xlast)/(xnext-xlast)
            wlow=1.-whigh
            y=ylast*wlow+ynext*whigh
        endif
    endif
    if (n.eq.1) y=sy
    if (n.ge.2) then
denom=sx*sx-n*sxx
        a=(sx*sy-n*sxy)/denom
        b=(sx*sxy-sxx*sy)/denom
        y=a*xnw(i)+b
        y=sy/n
    endif
    write(*,*) xnw(i),y
31    continue

end

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