```
c===========================================================
c
c     gpwave: Generates time-series of profiles of
c     left-moving "wave" (f(t+x) = constant) and outputs to
c     stdio in form suitable for susequent plotting with
c     'gnuplot'.
c
c     For parametric surface plots 'gnuplot', expects three
c     numbers per line:
c
c         x(i), y(j), f(i,j)
c
c     with all data points with the same x(i) on contiguous
c     lines (a group) and with empty lines separating
c     groups.  A quick glance at some sample output from this
c     program should make the arrangement clear.
c
c===========================================================
      program     gpwave

      implicit    none

      integer     i4arg

      integer     maxn
      parameter ( maxn = 100 )

      real*8      f
      real*8      x(maxn)
      integer     i,            j,            n,          nx,
     &            nt
      real*8      h,            t,            dt
```

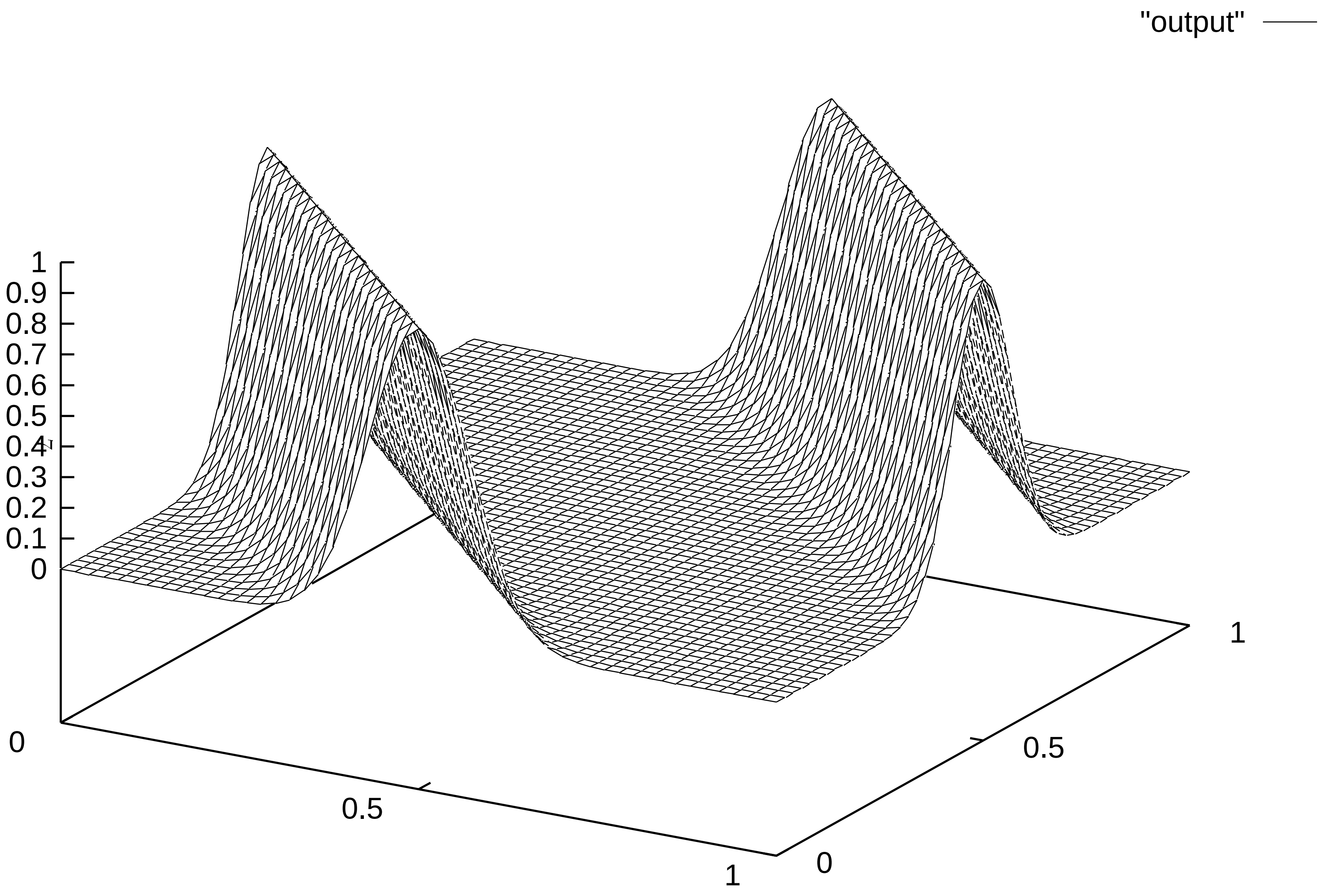
```
      n = i4arg(1,-1)
      if( n .lt. 1  .or.  n .gt. maxn ) goto 900
      nx = n
      nt = n

      h = 1.0d0 / (nx - 1)
      x(1) = 0.0d0
      do j = 1 , nx - 1
         x(j+1) = x(j) + h
      end do

      t = 0.0d0
      dt = 1.0d0 / (nt - 1)
      do i = 1 , nt
         do j = 1 , nx
c-----------------------------------------------------------
c           Output the cordinates and function value, three
c           per line, first coordinate (time) constant.
c-----------------------------------------------------------
            write(*,*) t, x(j), f(mod((x(j) + t),1.0d0))
         end do
c-----------------------------------------------------------
c           Empty line separates groups with distinct
c           first coordinate.
c-----------------------------------------------------------
         write(*,*)
         t = t + dt
      end do
      stop

900   continue
         write(0,*) 'usage: gpwave <n>'
      stop
      end
```

```
c-------------------------------------------------------------
c     Gaussian function.
c-------------------------------------------------------------
      double precision function f(x)
         implicit      none
         real*8        x
         f = exp(-((x-0.5d0)/0.1d0)**2)
         return
      end
```

```
############################################################
# Building and running 'gpwave' on sgi1.
#############################################################
sgi% pwd
/usr/people/phys410/fd/wave

sgi% ls
Makefile   gpin       gpwave.f

sgi% make
f77 -g -64 -c gpwave.f
f77 -g -64 -L/usr/local/lib gpwave.o -lp410f -o gpwave

#############################################################
# 'gpwave' expects a single argument, 'n'.  It then
# generates data which can be plotted as a two-dimensional
# surface (z(x,y)) using 'gnuplot'.
#############################################################
sgi% gpwave
 usage: gpwave <n>

#############################################################
# Generate data on a 51 x 51 mesh and save to file 'output'.
#############################################################
sgi% gpwave 51 > output

sgi% more gpin
#############################################################
# Sample gnuplot commands to read data in file 'output'
# and plot as 'parametric' surface plot with hidden lines
# removed.
#############################################################
set terminal postscript landscape
set output "output.ps"
```

```
set parametric
set hidden
splot "output" with lines
quit

############################################################
# Make the plot.
############################################################
sgi1% gnuplot < gpin

sgi% ls
Makefile    gpwave*     gpwave.o    output.ps
gpin        gpwave.f    output
```

```
############################################################
# Sample gnuplot commands to read data in file 'output'
# and plot as 'parametric' surface plot with hidden lines
# removed.
############################################################
set terminal postscript landscape
set output "output.ps"
set parametric
set hidden
splot "output" with lines
quit
```


"output"
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.5
1
0
0.5
1