**princ.f90**

!

use msflib ! biblioteca que contem o comando systemqq

logical chamada

!

parameter(npar=500)

dimension x(npar),y(npar),y2(npar)

open (unit=1,file='inp1.txt')

!

! input data

!

open (9,file='inptab.dat')

!

! output resulting curve data

!

open (3,file='outcarro.dat')

!

!

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

!

read(1,\*) n2,npontos

write(\*,\*)'n2=',n2,'; npontos=',npontos

!

!\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

!

!

! read table of data

!

do i=1,n2

read(9,\*) x(i),y(i)

enddo

y1=(y(2)-y(1))/(x(2)-x(1))

yn=(y(n2)-y(n2-1))/(x(n2)-x(n2-1))

call spline(x,y,n2,y1,yn,y2)

dx=(x(n2)-x(1))/npontos

xi=x(1)

do i=1,npontos+1

call splint(x,y,y2,n2,xi,yi)

write(3,\*)xi,yi

xi=xi+dx

enddo

close(3)

chamada = systemqq('notepad outcarro.dat') ! listagem dos dados

chamada = systemqq('wgnuplot dados.gnu') ! gráfico

stop

end

**dados.gnu**

set data style linespoints

set grid

set xlabel 'comprimento x'

set ylabel 'altura y'

set title 'Perfil de automóvel'

plot 'outcarro.dat'

pause -1

**inp1.txt**

500

**inptab.dat**

0. 0.

1. 50.

2. 40.

3. 0.

4. 100.

5. 20.

Ou

0.5 0.4

0.55 0.5

0.7 0.9

1. 1.15

1.2 1.18

1.5 1.23

1.6 1.25

1.7 1.27

1.8 1.38

1.9 1.7

2. 1.77

2.2 1.78

2.4 1.78

2.6 1.78

2.8 1.775

2.9 1.77

3.3 1.38

3.4 1.375

3.6 1.37

3.8 1.365

3.9 1.36

4. 1.355

4.2 1.35

4.3 1.3

4.5 0.6

Spline.f90

SUBROUTINE SPLINE(X,Y,N,YP1,YPN,Y2)

! implicit real \*8 (a-h,o-z)

PARAMETER (NMAX=100)

DIMENSION X(N),Y(N),Y2(N),U(NMAX)

IF (YP1.GT..99E30) THEN

Y2(1)=0.

U(1)=0.

ELSE

Y2(1)=-0.5

U(1)=(3./(X(2)-X(1)))\*((Y(2)-Y(1))/(X(2)-X(1))-YP1)

ENDIF

DO 11 I=2,N-1

SIG=(X(I)-X(I-1))/(X(I+1)-X(I-1))

P=SIG\*Y2(I-1)+2.

Y2(I)=(SIG-1.)/P

U(I)=(6.\*((Y(I+1)-Y(I))/(X(I+1)-X(I))-(Y(I)-Y(I-1))/(X(I)-X(I-1)))/(X(I+1)-X(I-1))-SIG\*U(I-1))/P

11 CONTINUE

IF (YPN.GT..99E30) THEN

QN=0.

UN=0.

ELSE

QN=0.5

UN=(3./(X(N)-X(N-1)))\*(YPN-(Y(N)-Y(N-1))/(X(N)-X(N-1)))

ENDIF

Y2(N)=(UN-QN\*U(N-1))/(QN\*Y2(N-1)+1.)

DO 12 K=N-1,1,-1

Y2(K)=Y2(K)\*Y2(K+1)+U(K)

12 CONTINUE

RETURN

END

Splint.f90

SUBROUTINE SPLINT(XA,YA,Y2A,N,X,Y)

! implicit real \*8 (a-h,o-z)

DIMENSION XA(N),YA(N),Y2A(N)

KLO=1

KHI=N

1 IF (KHI-KLO.GT.1) THEN

K=(KHI+KLO)/2

IF(XA(K).GT.X)THEN

KHI=K

ELSE

KLO=K

ENDIF

GOTO 1

ENDIF

H=XA(KHI)-XA(KLO)

IF (H.EQ.0.) PAUSE 'Bad XA input.'

A=(XA(KHI)-X)/H

B=(X-XA(KLO))/H

AUX=((A\*\*3-A)\*Y2A(KLO)+(B\*\*3-B)\*Y2A(KHI))\*(H\*\*2)/6.

Y=A\*YA(KLO)+B\*YA(KHI)+AUX

RETURN

END