```
 1: program EDO2EULER
 2: PARAMETER (NNN = 100000)
 3: implicit real*8 (a-h,o-z)
 4: real*8 DIFF,EXATA,X
 5: Dimension Y(0:NNN)
 6: Dimension Z(0:NNN)
 7: open(14,file="dados-Verlet-25do03exe01-2.txt")
 8: open(15,file="erro-Verlet-25do03exe01-2.txt")
 9: H = 0.001d0
10: NSTEP = int(10.d0/H)
11: PI = dACOS(-1.0d0)
12: Y(0) = PI/180.d0
13: ! Y(0) = 1.5d0*PI/180.d0   -> para 1,5 rads
14: Z(0) = 0.d0
15: Y(1) = Y(0) + H*Z(0) + 0.5d0*H**2*FUNC(X,Y(0))
16: DO 10 IX = 1, NSTEP-1
17:    X = IX*H
18:    Y(IX+1) = 2.d0*Y(IX) - Y(IX-1) + H**2*FUNC(X,Y(IX))
19:    DIFF = EXATA(X+H)-Y(IX+1)
20:    erro = dabs(DIFF/EXATA(X+H))
21:    write(14,*)X+H,Y(IX+1),EXATA(X+H)
22:    WRITE(15,*)erro
23: 10 CONTINUE
24: end
25:
26: real*8 function FUNC(X,Y)
27:      implicit real*8 (a-h,o-z)
28:      FUNC =  -((9.8d0)/1.d0)*dsin(Y)
29: end
30:
31: real*8 function exata(x)
32:      implicit real*8 (a-h,o-z)
33:      PI = dACOS(-1.0d0)
34:      exata =  (PI/180.d0)*dcos(dsqrt(9.8d0/1.d0)*x)
35:      ! exata =  (1.5d0*PI/180.d0)*dcos(dsqrt(9.8d0/1.d0)*x)     -> para 1,5 rads
36: end
```