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