```
 1: program EDO2EULER
 2: PARAMETER (NNN = 100000)
 3: implicit real*8 (a-h,o,q-z)
 4: COMMON / PI / pi
 5: real*8 DIFF,EXATA,X
 6: Dimension Y(0:NNN)
 7: Dimension Z(0:NNN)
 8: open(14,file="dados-Aula27d03exe01-H0,001.txt")
 9: open(15,file="erro-Aula27d03exe01-H0,001.txt")
10: PI = ACOS(-1.0)
11: H =  0.1d0 ! 0.01d0  ! 0.001d0
12: NSTEP = int(5.d0/H)
13: Y(0) = 1.d0
14: Z(0) = 0.d0
15: Y(1) = Y(0) + H*Z(0) + 0.5d0*H**2*FUNC(Y(0))
16: G = 4.d0*PI**2
17: DO 10 IX = 1, NSTEP-1
18:    X = IX*H
19:    T1 = 1.d0 + (H**2/12.d0)*G
20:    T2 = 1.d0 - (5.d0*H**2/12.d0)*G
21:    T3 = 1.d0 + (H**2/12.d0)*G
22:    Y(IX+1) = (2.d0*Y(IX)*T2 - Y(IX-1)*T3) / T1
23:
24:    DIFF = EXATA(X+H)-Y(IX+1)
25:    erro = dabs(DIFF/EXATA(X+H))
26:    write(14,*)X+H,Y(IX+1),EXATA(X+H)
27:    WRITE(15,*)erro
28: 10 CONTINUE
29: end
30:
31: real*8 function FUNC(Y)
32:      implicit real*8 (a-h,o,q-z)
33: COMMON / PI / pi
34:      FUNC = -4.d0*(PI**2)*Y
35: end
36:
37: real*8 function exata(x)
38:      implicit real*8 (a-h,o,q-z)
39: COMMON / PI / pi
40:      exata = dcos(2*PI*x)
41: end
```