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1: program EDO2EULER
2: parameter (NNN = 100000)
3: implicit real*8 (a-h,o-z)
4: dimension Y(0:NNN)
5: dimension Z(0:NNN)
6: open(14,file="euler2nd-dp-result-aula11do03.txt")
7: open(15,file="erro-euler2nd-dp-aula11do03.txt")
8: H = 0.001d0
9: NSTEP = 4.d0/H
10: Y(0) = 1.d0
11: Z(0) = -5.d0
12: do 10 IX = 0, NSTEP-1
13:   X = IX*H + 1
14:   Y(IX + 1) = Y(IX) + H*Z(IX)
15:   Z(IX + 1) = Z(IX) + H*func(X,Y(IX),Z(IX))
16:   DIFF = EXATA(X+H)-Y(IX+1)
17:   erro = dabs(DIFF/EXATA(X+H))
18:   write(14,*) X+H,Y(IX+1),EXATA(X+H)
19:   WRITE(15,*) erro
20: 10 continue
21: end
22:
23:
24: real*8 function func(X,Y,Z)
25: implicit real*8 (a-h,o-z)
26:   func = -3.d0*Z/X - 3.d0*Y/(X**2)
27: end
28:
29: real*8 function exata(x)
30: implicit real*8 (a-h,o-z)
31:   exata = x**(-1)*(dcos(dsqrt(2.d0)*log(x)) -
32:   2.d0*dsqrt(2.d0)*dsin(dsqrt(2.d0)*log(x)))
33: end
```