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1 !PROGRAM 10
2 ! Name: Debasis Buxy
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4 !to solve a differential equation numerically using HUEN'S METHOD
5 function FUNC(X,Y)
6     implicit none
7     real :: FUNC, Y, X
8     FUNC = Y
9 end function FUNC
10
11 program HEUN
12     implicit none
13     real :: FUNC
14     real :: H, X0, Y0, X1, Y1, Y1prime
15     integer :: I, N
16     open(unit=1, file="heunout.txt")
17     H = 0.1
18     X0 = 0.0
19     Y0 = 1.0
20     N = 40
21     write(1,*) X0, Y0
22     do I = 1, N
23         X1 = X0 + H
24         Y1prime = Y0 + H*FUNC(X0,Y0)
25         Y1 = Y0 + H*(FUNC(X0,Y0)+FUNC(X1,Y1prime))*0.5
26         write(1,*) X1, Y1
27         Y0 = Y1
28         X0 = X1
29     end do
30 end program HEUN

```