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1 !PROGRAM 5
2 ! Name: Debasis Buxy
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4 !to fit data points using LAGRANGE INTERPOLATION
5 module MODLI
6     real :: X(100), Y(100)
7 end module MODLI
8
9 subroutine SUBLI(N, X0, Y0)
10     use MODLI
11     implicit none
12     integer, intent(in) :: N
13     real, intent(in) :: X0
14     real, intent(out) :: Y0
15     real :: L, P
16     integer :: I, K
17     P = 0.0
18     do K = 1, N
19         L = 1.0
20         do I = 1, N
21             if (I /= K) then
22                 L = L*((X0-X(I))/(X(K)-X(I)))
23             end if
24         end do
25         P = P + Y(K)*L
26     end do
27     Y0 = P
28 end subroutine SUBLI
29
30 program INTERPOLATION
31     use MODLI
32     implicit none
33     real :: X1, Y1
34     integer :: N1, I
35
36     open(unit=1, file="lagrangein.txt")
37     read(1,*) N1
38     read(1,*) (X(I), Y(I), I=1,N1)
39     write(*,*) "Enter the value X:"
40     read(*,*) X1
41
42     call SUBLI(N1, X1, Y1)
43     write(*,*) "The value at X is:", Y1
44 end program INTERPOLATION

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