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1  //*****
2  //Program for implementation of Modified Newton-Raphson Method
3  //Coded by Ashwini K. Singh on 01-Feb-2021
4  //*****
5
6  #include<stdio.h>    // Inclusion of the input-output header file
7  #include<math.h>    // Inclusion of the math header file
8
9  //*****EVALUATION OF THE FUNCTION
10 float f(float x)
11 {
12     return ((x*x*x)-x-1);
13 }
14 //*****END OF FUNCTION f
15
16
17 //*****STARTING MAIN FUNCTION*****
18 int main(void)
19 {
20     int i, N;                                //Variable declaration
21     float h, x0, x1, e, df;                  //Variable declaration
22
23     FILE *input, *output;
24     input=fopen("inModifiedNewtonRaphson.txt", "r");
25     output=fopen("outModifiedNewtonRaphson.tsy", "w");
26
27     // Reading inputs from the input file
28     fscanf(input, "%f,%f,%d", &x0, &e, &N);
29
30     // Displaying inputs read from the input file on the console
31     printf("\nValues of x0, allowed error and maximum iterations read from
!inModifiedNewtonRaphson.txt! are: %f, %f, %d\n", x0, e, N);
32     // Writing the column-headers in the output file
33     fprintf(output, "Iteration\tx0\tx1\n");
34
35     //Calculation of df(x0)
36     df=(3*x0*x0)-1;

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37     for (i=1; i<=N; i++)
38     {
39         h=f(x0)/df;
40         x1=x0-h;
41         fprintf(output,"%3d\t%9.6f\t%9.6f\n", i, x0, x1);    // Writing the outputs in the
output file
42         if (fabs(h) < e)
43         {
44             printf("\nAfter %3d iterations, root = %8.6f\n", i, x1);    // Displaying the
final output on console
45             return 0;
46         }
47         x0=x1;
48     }
49     printf("\nThe required solution does not converge or iterations are insufficient\n");
50     return 1;
51 }
52 //*****END OF MAIN FUNCTION*****
53

```