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1  //*****
2  //Program for implementation of Newton-Raphson Method
3  //*****
4
5  #include<stdio.h>    // Inclusion of the input-output
header file
6  #include<math.h>    // Inclusion of the math header file
7
8  //*****EVALUATION OF THE FUNCTION
9  float f(float x)
10 {
11     return ((x*x*x)-x-1);
12 }
13 //*****END OF FUNCTION f
14
15 //*****EVALUATION OF THE DERIVATIVE OF FUNCTION
16 float df (float x)
17 {
18     return ((3*x*x)-1);
19 }
20 //*****END OF FUNCTION df
21
22 //*****STARTING MAIN FUNCTION*****
23 int main(void)
24 {
25     int i, N;                                //Variable
declaration
26     float h, x0, x1, e;                      //Variable
declaration
27
28     FILE *input, *output;
29     input=fopen("inNewtonRaphson.txt","r");
30     output=fopen("outNewtonRaphson.tsv","w");
31
32     // Reading inputs from the input file
33     fscanf(input,"%f,%f,%d", &x0, &e, &N);
34
35     // Displaying inputs read from the input file on the
console
36     printf("\nValues of x0, allowed error and maximum
iterations read from 'inNewtonRaphson.txt' are: %f, %f,
%d\n", x0, e, N);
37     // Writing the column-headers in the output file
38     fprintf(output,"Iteration\tx0\tx1\n");
39
40     for (i=1; i<=N; i++)
41     {
42         h=f(x0)/df(x0);
43         x1=x0-h;
44         fprintf(output,"%3d\t%9.6f\t%9.6f\n", i, x0,
x1); // Writing the outputs in the output file
45         if (fabs(h) < e)
46         {
47             printf("\nAfter %3d iterations, root =
%8.6f\n", i, x1); // Displaying the final output on
console

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48         return 0;
49     }
50     x0=x1;
51 }
52 printf("\nThe required solution does not converge or
iterations are insufficient\n");
53     return 1;
54 }
55 //*****END OF MAIN FUNCTION*****
56
57
```