

```

1  //*****
2  // BISECTION METHOD
3  //*****
4  #include<stdio.h>    // Inclusion of the input-output header file
5
6  #define eps 0.0005    //eps=EPSILON
7  #define N 20          //N= Maximum number of iterations
8
9  float func(float x);    //Function Prototype
10 float absolute(float y); //Function Prototype
11
12 //*****STARTING MAIN FUNCTION*****
13 int main(void)
14 {
15     float a,b,mid;        //Variable declaration
16     int i;                //Variable declaration
17
18     // Defining the input and output files
19
20     FILE *input, *out1, *out2;
21     input=fopen("input/data.txt","r");
22     out1=fopen("iterations/iteration.txt","w");
23     out2=fopen("mid values/mid.txt","w");
24     // End of input-output file definition
25
26     // Reading inputs from the input file
27     printf("Enter the brackets");
28     fscanf(input,"%f\t%f",&a,&b);
29     // End of reading the inputs from input file
30
31     if(func(a)*func(b)<0)
32     {
33         printf("The required roots\n");
34         printf("*****\n");
35         for(i=0;i<N;i++)
36         {
37             mid=(a+b)/2.0;
38             if(absolute(func(mid))<eps)
39                 break;
40             else if(func(mid)*func(a)<0)b=mid;
41             else if(func(mid)*func(b)<0)a=mid;
42
43             // Writing the outputs in the output files
44             fprintf(out1,"%d\n",i+1);
45             fprintf(out2,"%f\n",mid);
46         }
47         fprintf(out1,"%d\n",i+1);
48         fprintf(out2,"%f\n",mid);
49         // End of taking the outputs
50     }
51     else
52     {
53         printf("Please enter feasible values of brackets");
54     }
55     return 0;
56 }
57 //*****END OF MAIN FUNCTION*****
58
59 //*****EVALUATION OF THE FUNCTION
60 float func(float x)
61 {
62     return (x*x*x-x-1);
63 }
64 //*****END OF FUNCTION EVALUATION
65
66 // FUNCTION FOR OBTAINING THE ABSOLUTE
67 float absolute(float y)

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68  {
69      if (y<0)
70          return -1*y;
71      else
72          return y;
73  }
74  // END OF THE FUNCTION: ABSOLUTE
75
```