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1: // C-Program for calculationg Zero's of a function using Bisection
   Method.
2:
3: #include <stdio.h>
4: #include <math.h>
5:
6: int main(){
7:     //Variables
8:     int i; float x1, x2, x3, y1, y2, y3, e, er;
9:
10:    //Inputs
11:    printf("Enter the initial guess solutions and allowed error (Sep.
    by space) : ");
12:    scanf("%f %f %f", &x1, &x2, &e);
13:
14:    //Value of a function at x1 & x2.
15:    y1 = 3*x1 + sin(x1) - exp(x1);
16:    y2 = 3*x2 + sin(x2) - exp(x2);
17:
18:    //At both points, Function value should be of different sign.
19:    if (y1*y2 > 0){
20:        printf("Initial guess solutions are not appropriate.");
21:        goto out;
22:    }
23:
24:    //For Calculationg the number of iterations.
25:    i = 0;
26:    er = (x2-x1)*(x2-x1);
27:
28:    //Calculation using while loop.
29:    while(sqrt(er) >= e){
30:        x3 = (x1+x2)/2;
31:        y3 = 3*x3 + sin(x3) - exp(x3);
32:
33:        //Output
34:        printf("\ni = %d\nx1 = %f, x2 = %f,x3 = %f\ny1 = %f, y2 = %f,
    y3 = %f\n",i,x1,x2,x3,y1,y2,y3);
35:
36:        if (y1*y3 > 0){
37:            x1 = x3;
38:        }
39:        else{
40:            x2 = x3;
41:        }
42:
43:        y1 = 3*x1 + sin(x1) - exp(x1);

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44:         y2 = 3*x2 + sin(x2) - exp(x2);
45:
46:         i += 1;
47:         er = (x2-x1)*(x2-x1);
48:     }
49:     out:
50:     return 0;
51: }
```