

AMINA QADEER
CE-42-A
359607
NUMERICAL ANALYSIS
ASSIGNMENT 1

MATLAB CODE:

```
f = @(x) tanh(x/2)-1;
a= 1;
b=2;
n=20;
t=0.00001;
if f(a)*f(b)<0
    for i=1:n
        c=a+b/2;

        fprintf ( 'P%d=%.4f\n', i,c)

        if abs(c-b)<t || abs(c-a)<t
            break;
        end
        end
        if f(a)*f(c)<0
            b=c;
        end
        if f(b)*f(c)<0;
            a=c;
        end
    else
        disp ('No zero of equation present')
    end
end
```

Output:

n	a	fa	b	fb	c	fc
1	1.000000	-0.537883	2.000000	0.523188	1.500000	-0.047277
2	1.500000	-0.047277	2.000000	0.523188	1.750000	0.231835
3	1.500000	-0.047277	1.750000	0.231835	1.625000	0.090321
4	1.500000	-0.047277	1.625000	0.090321	1.562500	0.020974
5	1.500000	-0.047277	1.562500	0.020974	1.531250	-0.013296
6	1.531250	-0.013296	1.562500	0.020974	1.546875	0.003804
7	1.531250	-0.013296	1.546875	0.003804	1.539062	-0.004755
8	1.539062	-0.004755	1.546875	0.003804	1.542969	-0.000478
9	1.542969	-0.000478	1.546875	0.003804	1.544922	0.001663
10	1.542969	-0.000478	1.544922	0.001663	1.543945	0.000592
11	1.542969	-0.000478	1.543945	0.000592	1.543457	0.000057
12	1.542969	-0.000478	1.543457	0.000057	1.543213	-0.000210
13	1.543213	-0.000210	1.543457	0.000057	1.543335	-0.000076
14	1.543335	-0.000076	1.543457	0.000057	1.543396	-0.000009
15	1.543396	-0.000009	1.543457	0.000057	1.543427	0.000024
16	1.543396	-0.000009	1.543427	0.000024	1.543411	0.000007
17	1.543396	-0.000009	1.543411	0.000007	1.543404	-0.000001
18	1.543404	-0.000001	1.543411	0.000007	1.543407	0.000003
19	1.543404	-0.000001	1.543407	0.000003	1.543406	0.000001