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% Numerical solution of  $\cos x = x$  by the bisection method

a=0; b=1; fa=cos(a)-a; fb=cos(b)-b; jmax=20;

for j=1:jmax;
    x = a+(b-a)/2 ; fx = cos(x)-x ;
    printf('%f %f %f %f %f %f\n',a,x,b,fa,fx,fb);

    if sign(fx)==sign(fa),
        a=x; fa=fx;
    else
        b=x; fb=fx;
    end
end
end

```

Output:

a	x	b	fa	fx	fb
0.000000	0.500000	1.000000	1.000000	0.377583	-0.459698
0.500000	0.750000	1.000000	0.377583	-0.018311	-0.459698
0.500000	0.625000	0.750000	0.377583	0.185963	-0.018311
0.625000	0.687500	0.750000	0.185963	0.085335	-0.018311
0.687500	0.718750	0.750000	0.085335	0.033879	-0.018311
0.718750	0.734375	0.750000	0.033879	0.007875	-0.018311
0.734375	0.742188	0.750000	0.007875	-0.005196	-0.018311
0.734375	0.738281	0.742188	0.007875	0.001345	-0.005196
0.738281	0.740234	0.742188	0.001345	-0.001924	-0.005196
0.738281	0.739258	0.740234	0.001345	-0.000289	-0.001924
0.738281	0.738770	0.739258	0.001345	0.000528	-0.000289
0.738770	0.739014	0.739258	0.000528	0.000120	-0.000289
0.739014	0.739136	0.739258	0.000120	-0.000085	-0.000289
0.739014	0.739075	0.739136	0.000120	0.000017	-0.000085
0.739075	0.739105	0.739136	0.000017	-0.000034	-0.000085
0.739075	0.739090	0.739105	0.000017	-0.000008	-0.000034
0.739075	0.739082	0.739090	0.000017	0.000005	-0.000008
0.739082	0.739086	0.739090	0.000005	-0.000002	-0.000008
0.739082	0.739084	0.739086	0.000005	0.000001	-0.000002
0.739084	0.739085	0.739086	0.000001	-0.000000	-0.000002