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% Jie Wu
% Matlab HW15
% When using bisec_n and Newt_n, your first step should be to graph
% the function and find an interval that contains the root, or find an
% approximation of the root. Then, you can proceed with bisec_n and
% Newt_n **
% Due Date: 08/03/2017

(a)
>> bisec_n('eqn_1', -10,0 )
f_name =

'eqn_1'

Bisection Scheme

  It.   a          b         c            fa=f(a)     fc=f(c)    abs(fc-fa)
  1 -10.000000,  -5.000000  0.000000,  -97.802775,   0.000000    9.785e+01
  2  -5.000000,  -2.500000  0.000000,  -23.613706,   0.000000    2.382e+01
  3  -2.500000,  -1.250000  0.000000,   -5.844535,   0.000000    6.635e+00
  4  -1.250000,  -0.625000  0.000000,   -2.948794,   0.000000    4.309e+00
  5  -0.625000,  -0.312500  0.000000,   -1.371454,   0.000000    1.371e+00
  6  -0.312500,  -0.156250  0.000000,   -0.472350,   0.000000    4.723e-01
  7  -0.156250,  -0.078125  0.000000,   -0.194313,   0.000000    1.943e-01
  8  -0.078125,  -0.039062  0.000000,   -0.087449,   0.000000    8.745e-02
  9  -0.039062,  -0.019531  0.000000,   -0.041372,   0.000000    4.137e-02
 10  -0.019531,  -0.009766  0.000000,   -0.020106,   0.000000    2.011e-02
 11  -0.009766,  -0.004883  0.000000,   -0.009909,   0.000000    9.909e-03
 12  -0.004883,  -0.002441  0.000000,   -0.004919,   0.000000    4.919e-03
 13  -0.002441,  -0.001221  0.000000,   -0.002450,   0.000000    2.450e-03
 14  -0.001221,  -0.000610  0.000000,   -0.001223,   0.000000    1.223e-03
 15  -0.000610,  -0.000305  0.000000,   -0.000611,   0.000000    6.109e-04
 16  -0.000305,  -0.000153  0.000000,   -0.000305,   0.000000    3.053e-04
 17  -0.000153,  -0.000076  0.000000,   -0.000153,   0.000000    1.526e-04
 18  -0.000076,  -0.000038  0.000000,   -0.000076,   0.000000    7.630e-05
 19  -0.000038,  -0.000019  0.000000,   -0.000038,   0.000000    3.815e-05
 20  -0.000019,  -0.000010  0.000000,   -0.000019,   0.000000    1.907e-05
 21  -0.000010,  -0.000005  0.000000,   -0.000010,   0.000000    9.537e-06
 22  -0.000005,  -0.000002  0.000000,   -0.000005,   0.000000    4.768e-06
 23  -0.000002,  -0.000001  0.000000,   -0.000002,   0.000000    2.384e-06
 24  -0.000001,  -0.000001  0.000000,   -0.000001,   0.000000    1.192e-06
Tolerance is satisfied.
Final result: Root =    -0.000001

(b)
>> Newt_n('eqn_1', 2)
 n=  1, x= 1.00102e+00, y = -1.26109e+01,  yd = -1.26239e+01
 n=  2, x= 6.88531e-01, y = -2.28918e+00,  yd = -7.32552e+00
 n=  3, x= 6.11607e-01, y = -3.79584e-01,  yd = -4.93453e+00
 n=  4, x= 6.05365e-01, y = -2.69226e-02,  yd = -4.31343e+00
 n=  5, x= 6.05268e-01, y = -4.13312e-04,  yd = -4.26254e+00
 n=  6, x= 6.05267e-01, y = -3.99547e-06,  yd = -4.26175e+00

     Final answer = 6.052671e-01

ans =

    0.6053

>> Newt_n('eqn_1', 1)
 n=  1, x= 6.88208e-01, y = -2.28172e+00,  yd = -7.31808e+00
 n=  2, x= 6.11564e-01, y = -3.78006e-01,  yd = -4.93195e+00
 n=  3, x= 6.05364e-01, y = -2.67399e-02,  yd = -4.31308e+00
 n=  4, x= 6.05268e-01, y = -4.09485e-04,  yd = -4.26253e+00
 n=  5, x= 6.05267e-01, y = -3.95813e-06,  yd = -4.26175e+00

     Final answer = 6.052671e-01

ans =

     0.6053

>> Newt_n('eqn_1', 3)
 n=  1, x= 4.74126e-01, y = -2.49145e+01,  yd = -9.86370e+00
 n=  2, x= 6.26060e-01, y =  4.82632e-01,  yd = -3.17659e+00
 n=  3, x= 6.05855e-01, y = -8.95282e-02,  yd = -4.43099e+00
 n=  4, x= 6.05273e-01, y = -2.48270e-03,  yd = -4.26654e+00
 n=  5, x= 6.05267e-01, y = -2.51274e-05,  yd = -4.26179e+00
 n=  6, x= 6.05267e-01, y = -2.40760e-07,  yd = -4.26174e+00

     Final answer = 6.052671e-01

ans =

    0.6053
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