

MA 322 Scientific Computing

Lab Assignment – 4

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(1)

Final Solution: [1.77767192, 1.42396060, 1.23747112]

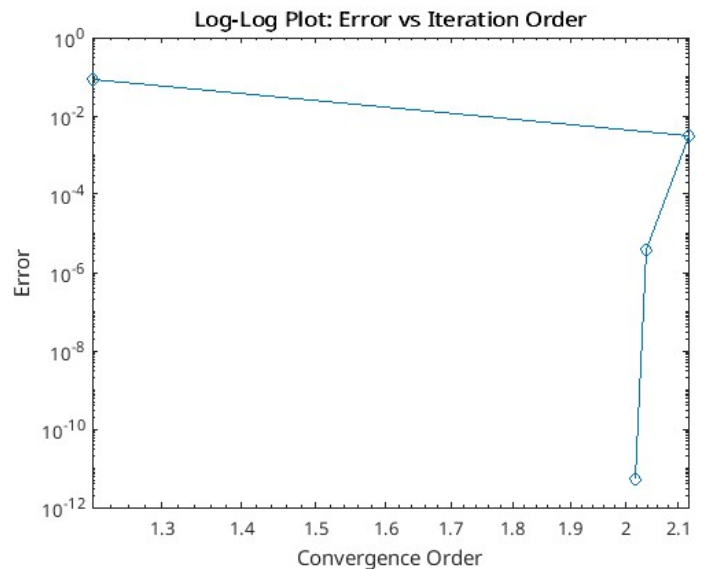
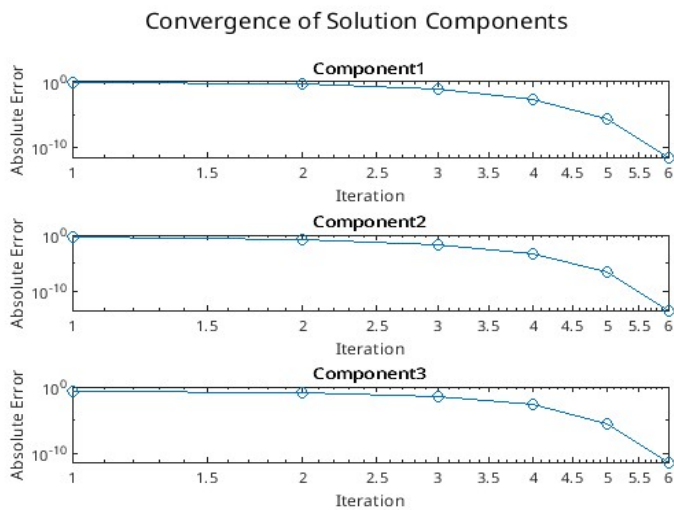
Residue: 2.4379e-11

Exact Solution: [1.77767192, 1.42396060, 1.23747112]

Error: 5.4168e-12

Iteration Table:

Iteration	Iterate	Error
0	[1.000000,1.000000,1.000000]	1.388462
1	[2.189326,1.598475,1.393901]	0.389754
2	[1.850590,1.444251,1.278224]	0.082876
3	[1.780161,1.424436,1.239292]	0.003117
4	[1.777675,1.423961,1.237474]	0.000004
5	[1.777672,1.423961,1.237471]	0.000000



(2)

(a)

Final Solution: [0.33333333, 0.50000000]

Residue: 1.0187

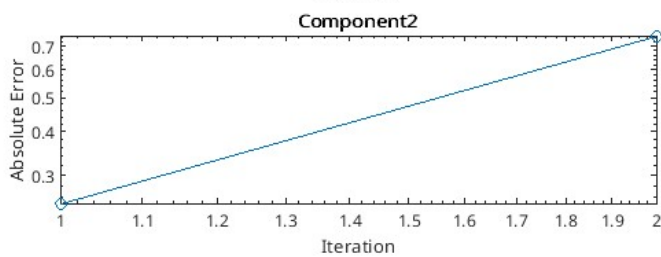
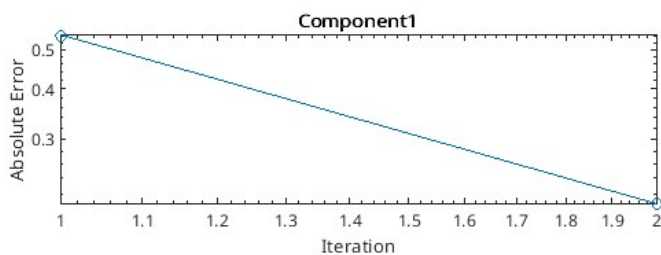
Exact Solution: [0.54166667, 1.25000000]

Error: 0.7784

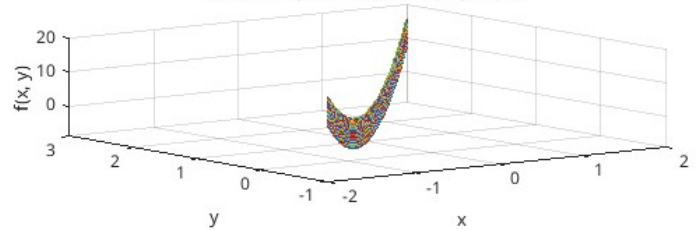
Iteration Table:

Iteration	Iterate	Error
0	[0.000000,1.000000]	0.600925
1	[0.333333,0.500000]	0.778398
2	[0.541667,1.250000]	0.282502

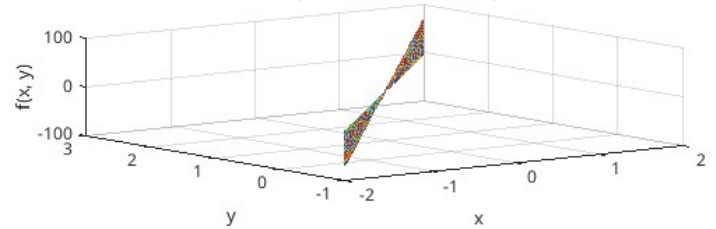
Convergence of Solution Components



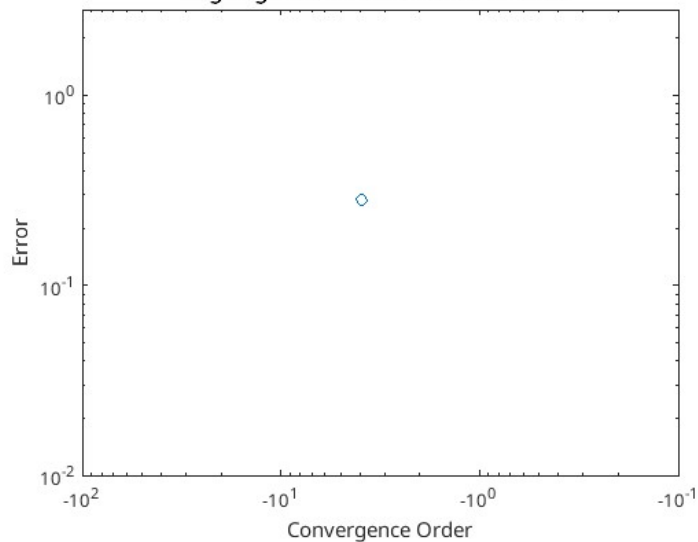
Function plot for first component



Function plot for second component



Log-Log Plot: Error vs Iteration Order



(b)

Final Solution: [-0.29317801, 1.17263436]

Residue: 9.0538e-05

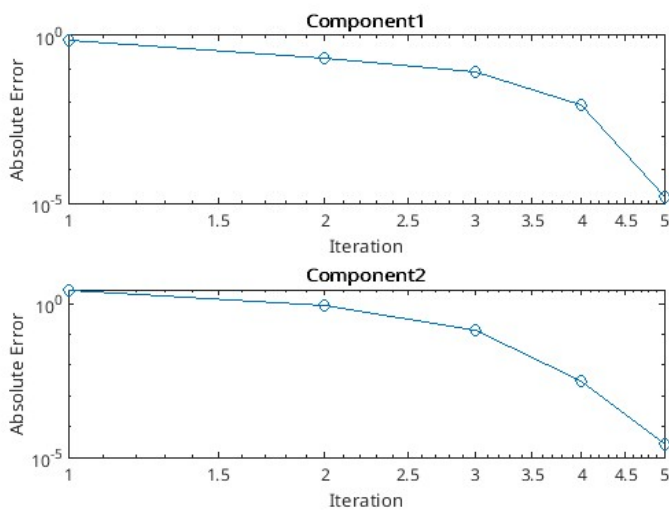
Exact Solution: [-0.29316269, 1.17265982]

Error: 2.971e-05

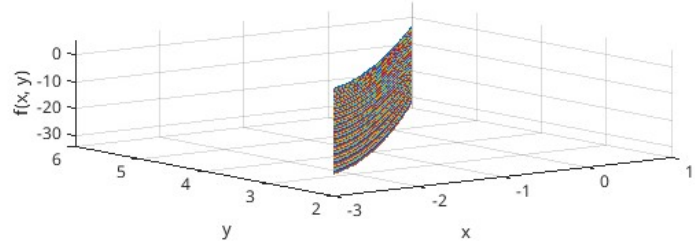
Iteration Table:

Iteration	Iterate	Error
0	[-1.000000,4.000000]	2.048726
1	[-0.504703,2.012047]	0.715594
2	[-0.374867,1.308330]	0.151608
3	[-0.301307,1.175764]	0.008711
4	[-0.293178,1.172634]	0.000030

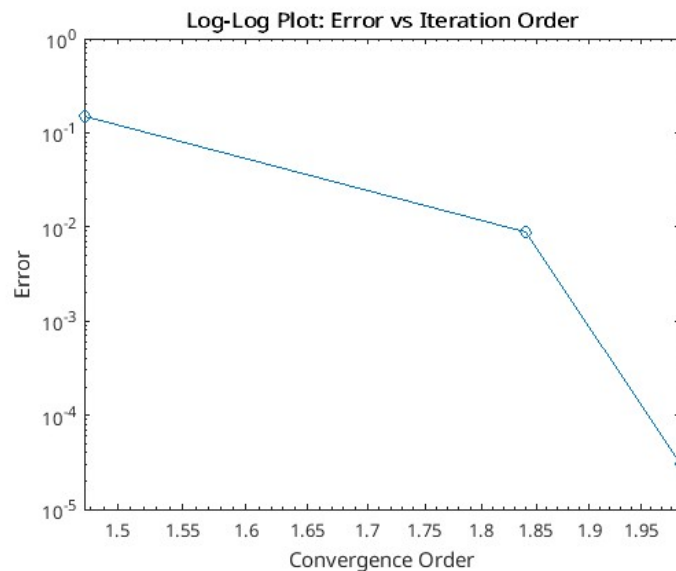
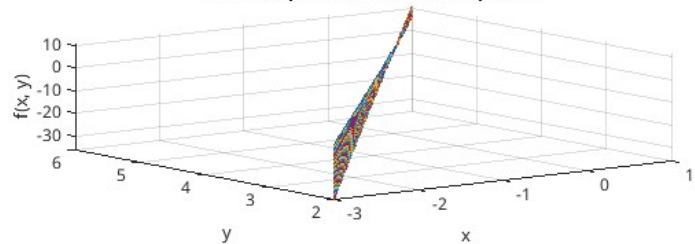
Convergence of Solution Components



Function plot for first component



Function plot for second component



(3)

Converged in 4 iterations.

Final Solution: [0.49814468, -0.19960590, -0.52882598]

Residue: 8.8233e-11

Exact Solution: [0.49814468, -0.19960590, -0.52882598]

Error: 7.5767e-12

Iteration Table:

Iteration	Iterate	Error
0	[0.000000,0.000000,0.000000]	0.747532
1	[0.500000,-0.186142,-0.523599]	0.014561
2	[0.498158,-0.199607,-0.528826]	0.000013
3	[0.498145,-0.199606,-0.528826]	0.000000

Convergence of Solution Components

