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Project8



Given the vector system of equations above we know that a fixed point exist on for i = {1,2,3}, we use fixed point iteration to find the corresponding x vector components such that where G = [g1, g2, g3] and = [x1,x2,x3]. Running the regular fixed point iteration with an initial guess of , and a tolerance of 1e-5 we find it takes three iterations to converge to a final estimate for .

k| x1| x2| x3| norm(x(k)-x(k-1))

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01 0.49998 0.00944 -0.52310 0.39998

02 0.50000 0.00003 -0.52336 0.00001

03 0.50000 0.00001 -0.52360 0.00000

Using Gauss-Seidel iteration we can reduce the number of iterations required, however the Improvement is minimal since the original iteration method only took three iterations to converge.

k| x1| x2| x3| norm(x(k)-x(k-1))

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01 0.49998 0.02223 -0.52305 0.39998

02 0.49998 0.00003 -0.52360 0.00001