

Problem Set

Chapter 04.08 Gauss-Seidel Method

1. Solve the following system of equations using Gauss-Seidel method.

$$12x_1 + 7x_2 + 3x_3 = 17$$

$$3x_1 + 6x_2 + 2x_3 = 9$$

$$2x_1 + 7x_2 - 11x_3 = 49$$

Conduct 3 iterations. Calculate the maximum absolute relative approximate error at the end of each iteration. Choose $[x_1 \ x_2 \ x_3] = [1 \ 3 \ 5]$ as your initial guess.

2. Solve the following system of equations using Gauss-Seidel method.

$$3x_1 + 6x_2 + 2x_3 = 9$$

$$12x_1 + 7x_2 + 3x_3 = 17$$

$$2x_1 + 7x_2 - 11x_3 = 49$$

Conduct 3 iterations. Calculate the maximum absolute relative approximate error at the end of each iteration, and Choose $[x_1 \ x_2 \ x_3] = [1 \ 3 \ 5]$ as your initial guess.

3. Solve the following system of equations using Gauss-Seidel method.

$$3x_1 + 6x_2 + 2x_3 = 9$$

$$12x_1 + 7x_2 + 3x_3 = 17$$

$$2x_1 + 7x_2 - 11x_3 = 49$$

Conduct 3 iterations. Calculate the maximum absolute relative approximate error at the end of each iteration, and Choose $[x_1 \ x_2 \ x_3] = [1.1 \ 2.1 \ -2.9]$ as your initial guess.