

HOMEWORK-4- (Due on 15.11.2019)

- 1) Use the Gauss-Seidel method to solve the following system until the percent relative error falls below $\epsilon_s = 5\%$. Before solving, change the order of equations to satisfy

$$|a_{ii}| > \sum_{\substack{j=1 \\ j \neq i}}^n |a_{ij}|$$

$$-3x_1 - 6x_2 + 2x_3 = -61.5$$

$$10x_1 + 2x_2 - x_3 = 27$$

$$x_1 + x_2 + 5x_3 = -21.5$$

Apply relaxation $\lambda = 1.2$ in your solution.

2)

$$\begin{bmatrix} 0.8 & -0.4 & \\ -0.4 & 0.8 & -0.4 \\ & -0.4 & 0.8 \end{bmatrix} \begin{Bmatrix} x_1 \\ x_2 \\ x_3 \end{Bmatrix} = \begin{Bmatrix} 41 \\ 25 \\ 105 \end{Bmatrix}$$

Take the Inverse of Matrix by LU decomposition using Thomas algorithm, and solve this system by using Inverse Matrix.