

Department of Mechanical Engineering  
Indian Institute of Technology Kanpur  
ME685A: Home Assignment 4

Due: on or before September 04, 2021

This assignment must be your own work. Taking help from others or helping others are not allowed.

Consider a nonsingular  $n \times n$  matrix  $\mathbf{A}$  and an  $n$ -dimensional column vector  $\mathbf{b}$ . Using Gauss-Seidel method, we wish to solve for the  $n$ -dimensional column vector  $\mathbf{x}$  where  $\mathbf{Ax} = \mathbf{b}$

1. Write a computer program for the Gauss-Seidel method.
2. Use the program to solve

$$\begin{bmatrix} 4 & 1 & 1 & 1 \\ 1 & 4 & 1 & 1 \\ 1 & 1 & 4 & 1 \\ 1 & 1 & 1 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \\ x_4 \end{bmatrix} = \begin{bmatrix} 7 \\ 7 \\ 7 \\ 7 \end{bmatrix}$$

Write your name and roll no at the top of each page. Also write your name and roll no in the computer program (duly commented). Put all documents in a folder. Name the folder as < name > \_ < roll > \_ < hw1 >. Zip the folder and upload in MooKit.

Your program file must be a plain text file. The file extension should be as per your programming language (\*.c, \*.cpp, \*.f90, \*.py etc.)