

Exercise Class Numerical Linear Algebra
Iterative Methods for Linear Systems

Exercise 1: Write a script that checks if a matrix $A \in \mathbb{R}^{n \times n}$ is diagonally dominant.

Exercise 2: Write a script which reads a square matrix $A \in \mathbb{R}^{n \times n}$ and a vector $b \in \mathbb{R}^n$ and solves the linear system $Ax = b$ with Jacobi's method. Plot the history of the the residual $\|r\|$.

Exercise 3: Write a script which reads a square matrix $A \in \mathbb{R}^{n \times n}$ and a vector $b \in \mathbb{R}^n$ and solves the linear system $Ax = b$ with Gauss-Seidel's method. Plot the history of the the residual $\|r\|$

Exercise 4: Write a script that takes as input a symmetric and positive matrix A and solves a linear system $Ax = b$ using the conjugate gradient method.