The Jacobi Method

Let A be an invertible square matrix with all the diagonal elements non-zero.

$$A = L + D + U$$

The vector x is a solution of the system $Ax = b \Leftrightarrow$

$$\Leftrightarrow (L + D + U)x = b \Leftrightarrow$$

$$Dx = b - (L + U)x$$

$$\Leftrightarrow x = D^{-1}[b - (L + U)x]$$

Iterative formula:

$$x_{k+1} = D^{-1}[b - (L + U)x_k], \qquad k = 0, 1, 2, 3, \ldots \qquad (1)$$

Gauss-Seidel method

Let A be an invertible square matrix with all the diagonal elements non-zero.

$$A = L + D + U$$

The vector x is a solution of the system $Ax = b \Leftrightarrow$

$$\Leftrightarrow (L + D + U)x = b \Leftrightarrow$$

$$(L + D)x = b - Ux$$

$$\Leftrightarrow x = (L + D)^{-1}[b - Ux]$$

Iterative formula:

$$x_{k+1} = (L + D)^{-1}[b - Ux_k], \qquad k = 0, 1, 2, 3, \ldots \qquad (2)$$