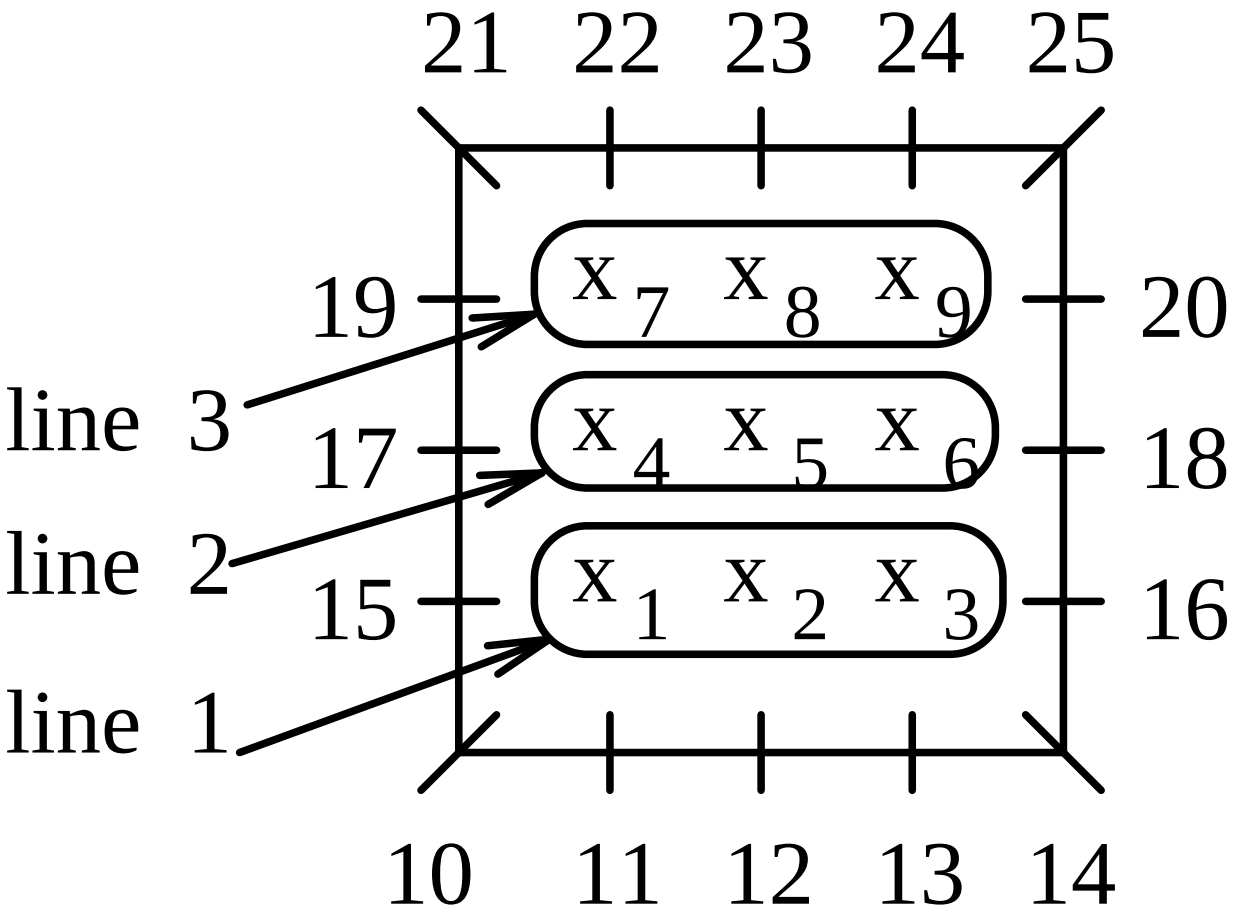
$$4v_{i,j} - v_{i+1,j} - v_{i-1,j} - v_{i,j+1} - v_{i,j-1}$$



$$\begin{bmatrix}
4 & -1 & 0 & -1 & & & & & \\
-1 & 4 & -1 & 0 & -1 & & \oslash & & \\
0 & -1 & 4 & 0 & 0 & -1 & & & \\
-1 & 0 & 0 & 4 & -1 & 0 & -1 & & \\
 & -1 & 0 & -1 & 4 & -1 & 0 & -1 & \\
 & & -1 & 0 & -1 & 4 & 0 & 0 & -1 \\
 & & & -1 & 0 & 0 & 4 & -1 & 0 \\
 & \oslash & & & -1 & 0 & -1 & 4 & -1 \\
 & & & & & -1 & 0 & -1 & 4
\end{bmatrix}$$

$$\begin{bmatrix} A_{1,1} & A_{1,2} & 0 \\ A_{2,1} & A_{2,2} & A_{2,3} \\ 0 & A_{3,2} & A_{3,3} \end{bmatrix} \begin{bmatrix} U_1 \\ U_2 \\ U_3 \end{bmatrix} = \begin{bmatrix} F_1 \\ F_2 \\ F_3 \end{bmatrix},$$

$$A_{k,k} = \begin{bmatrix} 4 & -1 & 0 \\ -1 & 4 & -1 \\ 0 & -1 & 4 \end{bmatrix}$$

$$A_{k+1,k} = A_{k,k+1} = \begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}.$$

Gauss Jacobi (point).

for $i = 1, \ldots, n$ do

$$x_i^{(k+1)} = \left(b_i - \sum_{\substack{j=1 \\ j \neq i}}^{n} a_{ij} x_j^{(k)} \right) / a_{ii}$$

end for

Gauss Jacobi (block).

for $i = 1, \ldots, q$ do

$$X_i^{(k+1)} = A_{i,i}^{-1} \left(B_i - \sum_{\substack{j=1 \\ j \neq i}}^{q} A_{ij} X_j^{(k)} \right).$$

end for

Gauss Seidel (block)

$$\begin{aligned}&\text{for } i = 1, \ldots, q \text{ do}\\ &\qquad X_i^{(k+1)} = A_{i,i}^{-1}\\ &\qquad \left(B_i - \sum_{j=1}^{i-1} A_{i,j} X_j^{(k+1)} - \sum_{j=i+1}^{q} A_{i,j} X_j^{(k)}\right)\\ &\text{end for}\end{aligned}$$

SOR (block)

$$\begin{aligned}&\text{for } i = 1, \ldots, q \text{ do}\\ &\qquad X_i^{(k+1)} = (1-\omega) X_i^{(k)} + \omega A_{i,i}^{-1}\\ &\qquad \left(B_i - \sum_{j=1}^{i-1} A_{i,j} X_j^{(k+1)} - \sum_{j=i+1}^{q} A_{i,j} X_j^{(k)}\right)\\ &\text{end for}\end{aligned}$$