

1962 —

Note Title

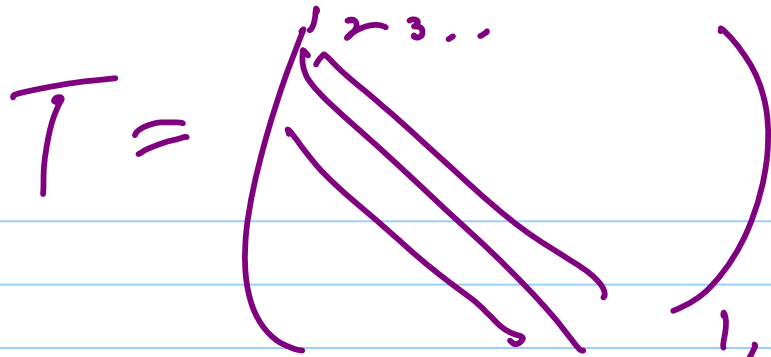
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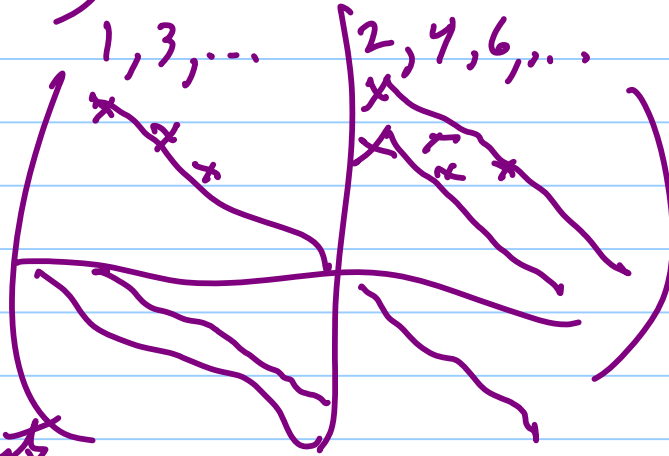
S. O. R. =

Successive Overrelaxation

Property A: $A = A^T$
 $\Pi A \Pi = \left(\begin{array}{c|c} D_1 & F \\ \hline F^T & D_2 \end{array} \right)$



$\Pi \uparrow \Pi \uparrow \Pi \uparrow \approx$



$\tilde{x} = \begin{matrix} u \\ \sim \\ v \\ \sim \end{matrix} \left. \begin{matrix} \text{odd components} \\ \text{even components} \end{matrix} \right\}$

$$\begin{matrix} a & u \\ \tilde{F} & \sim \\ \tilde{u} & \end{matrix} + \begin{matrix} F & v \\ \sim & \sim \\ \tilde{v} & \end{matrix} = \frac{b}{\sim}$$

$$\begin{matrix} \tilde{F} & u \\ \sim & \sim \\ \tilde{u} & \end{matrix} + \begin{matrix} a & v \\ \tilde{v} & \sim \\ \tilde{v} & \end{matrix} = c$$

$$\vec{u} = -\frac{1}{a} F \vec{v} + \frac{1}{a} \vec{b}$$

$$-\frac{1}{a} F^T F \vec{v} + \vec{v} = \vec{c}$$

$$F^T F \vec{v} - a^2 \vec{v} = \vec{d}$$

$$\left(\begin{array}{c} \diagdown \\ \diagup \end{array} \right)$$

Cyclic reduction

$$\left(\begin{array}{ccc} A-I & & 0 \\ -I & \ddots & \\ & \ddots & -I \\ 0 & & -I \end{array} \right) \begin{array}{c} \\ \\ \\ A \end{array}$$

$$A = \left(\begin{array}{c} \diagdown \\ \diagup \end{array} \right)$$

$$\begin{pmatrix} A^{(1)} & \dots & 0 \\ \vdots & A^{(2)} & \dots \\ 0 & \dots & A^{(n)} \end{pmatrix} \sim \begin{pmatrix} A^{(1)} \\ \vdots \\ A^{(n)} \end{pmatrix}$$

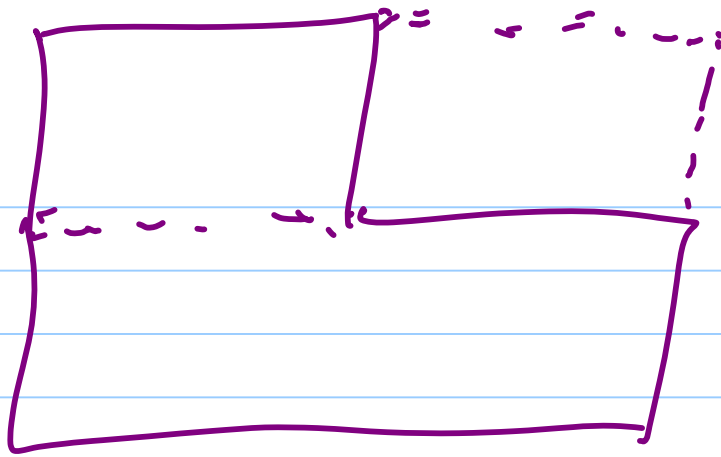
$$Ax = b$$

$$A = LU$$

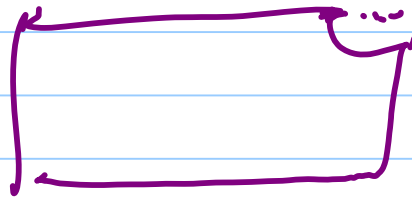
$$-\nabla a(x, y) \nabla u = f$$

$$-\Delta v_k + \sigma(x, y) v_k = g$$

$$\mathbf{M}v - \mathbf{N}v = g$$



Domain
Decomposition



$$\tilde{A} = \left(\begin{array}{c|c} 0 & A \\ \hline A^T & 0 \end{array} \right)$$

$$\lambda(\tilde{A}) = \pm \sigma(A)$$

$$\left(\begin{array}{c|c} 0 & B \\ \hline B^T & 0 \end{array} \right) \sim \left(\begin{array}{c|c} 0 & B \\ \hline B^T & 0 \end{array} \right)$$