

A place to network and exchange ideas.

$$x = B^{-1} b^0$$

$$b^0 = (2A+I)(E^{-1}A)b$$

$$= \underbrace{(2A+I)A}_{b'} b + (2A+I) \underbrace{C^{-1}b}_{b^2}$$

solve $Bx = b^0$ by LU
QR factorization

solve $Cb^2 = b$ by factorization

$$b^2 = C^{-1}b$$

$$Cb^2 = b$$

① b^2 by solving $Cb^2 = b$

② $b' = (2A+I)Ab$

③ $b^0 = b' + (2A+I)b^2$

$$\begin{matrix} + & \downarrow \\ \begin{matrix} | \\ | \\ | \\ | \end{matrix} & \begin{matrix} \boxed{-2} \\ \boxed{-2} \\ \boxed{-2} \\ \boxed{-2} \end{matrix} \\ & = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \end{matrix}$$

④ x by solving $B^{-1}b^0$

2.2(c)

$$A \rightarrow \tilde{A} = A + \underbrace{\begin{pmatrix} 0 & -2 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{pmatrix}}_{-2 e_1^T e_2}$$

$$e_k = \begin{pmatrix} 0 \\ \vdots \\ 1 \\ \vdots \\ 0 \end{pmatrix} \text{ kth st} \\ e_k(j) = \begin{cases} 1 & j=k \\ 0 & \text{else} \end{cases}$$

$$\tilde{A} = A - 2 e_1^T e_2$$

$$\tilde{x} = \tilde{A}^{-1}b = \left(A^{-1} - \frac{A^{-1}u v^T A^{-1}}{1 + v^T A^{-1}u} \right) b = \underbrace{A^{-1}b}_x - \frac{A^{-1}u v^T x}{1 + v^T A^{-1}u} = \dots$$