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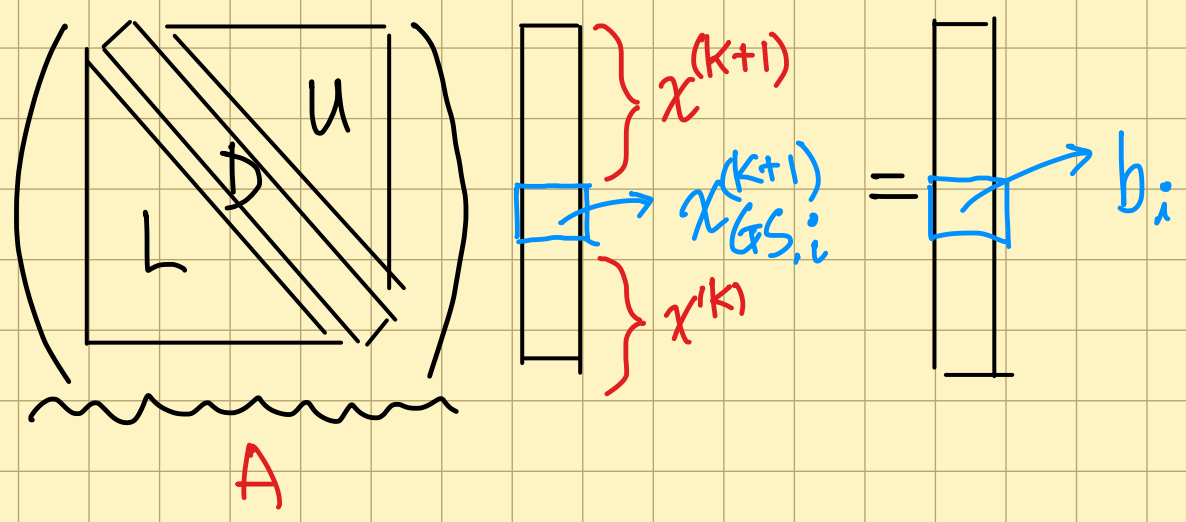
SOR 행렬 표현식 유도

$$x_i^{(k+1)} = \omega x_{GS,i}^{(k+1)} + (1-\omega) x_i^{(k)}$$



$$\Rightarrow \quad L x^{(k+1)} + D x_{GS}^{(k+1)} + U x^{(k)} = b$$

$$x_{GS}^{(k+1)} = D^{-1}\left(b - L x^{(k+1)} - U x^{(k)}\right)$$

SOR 식에 대입하면,

$$x^{(k+1)} = \omega D^{-1}\left(b - L x^{(k+1)} - U x^{(k)}\right) + (1-\omega) x^{(k)}$$

$$D x^{(k+1)} = \omega b - \omega L x^{(k+1)} - \omega U x^{(k)} + (1-\omega) D x^{(k)}$$

$$\underbrace{(D + \omega L)}_{M} x^{(k+1)} = \underbrace{(-\omega U + (1-\omega) D)}_{N} x^{(k)} + \omega b$$

$$\Rightarrow \quad M x^{(k+1)} = N x^{(k)} + \omega b$$

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