

HW 4

1  $\begin{bmatrix} 4 & -1 & 0 \\ -1 & 4 & -1 \\ 0 & -1 & 4 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 2 \\ 4 \\ 10 \end{bmatrix}$  , OPTIMAL SOLUTION IS  $x = \begin{bmatrix} 2 \\ 2 \\ 3 \end{bmatrix}$

a SOLVE BY 'SUCCESSIVE OVER-RELAXATION'  
w/  
OPTIMAL PARAMETER  $\omega = \frac{2}{1 + \sqrt{1/8}}$   
LET  $x^{(0)} = \begin{bmatrix} 2 \\ 2 \\ 3 \end{bmatrix}$

EXAMPLE:

$B_\omega$  IS... YOUR SOLUTION  $x \approx [1 \ 2 \ 3]^T$  IN THIS CASE  
AFTER  $k$  ITERATIONS BOUND AS ABOVE ... WHICH IS CURRENTLY COPIED  
 $x_k = [1, 0]$   $\xleftrightarrow{(\omega)}$   $B_\omega$

HE WOULD NOT BECH TO LEAVE  
BEHIND HIM ANY COMMENTARY  
OR WRITING ON SUCH SUBJECTS