Step-1

We have to show that A = 4*eye(4) - ones(4,4) is not invertible.

Step-2

Given that A = 4 * eye(4) - ones(4,4)

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

$$= \begin{bmatrix} 3 & -1 & -1 & -1 \\ -1 & 3 & -1 & -1 \\ -1 & -1 & 3 & -1 \\ -1 & -1 & -1 & 3 \end{bmatrix}$$

$$A = \begin{bmatrix} 3 & -1 & -1 & -1 \\ -1 & 3 & -1 & -1 \\ -1 & -1 & 3 & -1 \\ -1 & -1 & -1 & 3 \end{bmatrix}$$
Therefore,

Step-3

Now we have to multiply A^* ones (4,1).

Now

$$\begin{bmatrix} 3 & -1 & -1 & -1 \\ -1 & 3 & -1 & -1 \\ -1 & -1 & 3 & -1 \\ -1 & -1 & -1 & 3 \end{bmatrix} \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} = \begin{bmatrix} 3(1) + (-1)1 + (-1)1 + (-1)1 \\ (-1)(1) + (3)1 + (-1)1 + (-1)1 \\ (-1)(1) + (-1)1 + (-1)1 + (-1)1 \\ (-1)(1) + (-1)1 + (-1)1 + (3)1 \end{bmatrix}$$
$$= \begin{bmatrix} 3 - 1 - 1 - 1 \\ -1 + 3 - 1 - 1 \\ -1 - 1 - 1 + 3 - 1 \\ -1 - 1 - 1 + 3 \end{bmatrix}$$
$$= \begin{bmatrix} 0 \\ 0 \\ 0 \\ 0 \end{bmatrix}$$

Therefore, the system Ax = 0 has zero solution.

Hence *A* is not invertible.