

Find the least-squares solution(s) to the equation $A\mathbf{x} = \mathbf{b}$

$$1. A = \begin{bmatrix} 3 & -1 & 2 \\ 4 & 1 & 5 \\ 1 & 0 & -2 \\ 1 & 3 & 2 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 2 \\ 3 \\ 0 \\ -1 \end{bmatrix}$$

$$2. A = \begin{bmatrix} 2 & -1 \\ -3 & -2 \\ -2 & 2 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 5 \\ -1 \\ 3 \end{bmatrix}$$

$$3. A = \begin{bmatrix} 3 & 1 & 2 \\ -1 & 2 & -3 \\ 0 & 2 & -2 \\ 4 & 1 & 3 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 5 \\ 1 \\ -2 \\ 3 \end{bmatrix}$$