

25 Dec '21

$$\begin{array}{c}
 A \qquad \qquad I \qquad \qquad b \\
 R_1 \left[\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 0 & 0 \end{array} \right] \left[\begin{array}{c} 12 \\ 38 \\ 10 \end{array} \right] \\
 R_2 \left[\begin{array}{ccc|ccc} 2 & 4 & 4 & 0 & 1 & 0 \end{array} \right] \\
 R_3 \left[\begin{array}{ccc|ccc} 0 & 1 & 2 & 0 & 0 & 1 \end{array} \right]
 \end{array}$$

$$\begin{array}{ccc|ccc} 0 & 2 & 2 & -2 & 1 & 0 \end{array} \quad \begin{array}{c} 38-24 \\ 14 \end{array} \quad R_2 - 2R_1 \rightarrow R_2'$$

$$\begin{array}{ccc|ccc} 0 & 0 & 1 & 1 & -1/2 & 1 \end{array} \quad \begin{array}{c} 3 \\ 3 \end{array} \quad R_3 - 1/2 R_2' \rightarrow R_3'$$

$$\begin{array}{c} \downarrow U = L_1' A \\ R_1 \left[\begin{array}{ccc|ccc} 1 & 1 & 1 & 1 & 0 & 0 \end{array} \right] \left[\begin{array}{c} 12 \\ 14 \\ 3 \end{array} \right] \\
 R_2' \left[\begin{array}{ccc|ccc} 0 & 2 & 2 & -2 & 1 & 0 \end{array} \right] \\
 R_3' \left[\begin{array}{ccc|ccc} 0 & 0 & 1 & 1 & -1/2 & 1 \end{array} \right]
 \end{array}$$

$$\begin{array}{ccc|ccc} 1 & 0 & 0 & 2 & -1/2 & 0 \end{array} \quad \begin{array}{c} 5 \\ 8 \end{array} \quad R_1 - 1/2 R_3' \rightarrow R_1'$$

$$\begin{array}{ccc|ccc} 0 & 2 & 0 & -4 & 2 & -2 \end{array} \quad \begin{array}{c} 8 \\ 2 \end{array} \quad R_2' - 2R_3' \rightarrow R_2''$$

$$\begin{array}{c} I = L_2' A \qquad A^{-1} = L_2^{-1} I \qquad x = A^{-1} b \Rightarrow L_2^{-1} = A^{-1} \\
 \left[\begin{array}{ccc|ccc} 1 & & & 2 & -1/2 & 0 \\ & 1 & & -2 & 1 & -1 \\ & & 1 & 1 & -1/2 & 1 \end{array} \right] \left[\begin{array}{c} 5 \\ 4 \\ 3 \end{array} \right]
 \end{array}$$

$$\left[\begin{array}{ccc|ccc} 1 & 1 & 1 & 2 & -1/2 & 0 \\ 2 & 4 & 4 & -2 & 1 & -1 \\ 0 & 1 & 2 & 1 & -1/2 & 1 \end{array} \right] \left[\begin{array}{c} 12 \\ 38 \\ 10 \end{array} \right]$$

