$$\begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} = A$$

$$E_1^{-1} = (I - m_1 e_1^T) = I + m_1 e_1^T$$

$$E_1 = I - m_1 e_1^T$$

$$E_1 A = U$$

$$A = E_1^{-1} U$$

$$E_1^{-1} = L$$

$$A = LU = E_1^{-1} E_1 A$$

$$LU = \begin{bmatrix} 1 & 0 \\ m_{21} & 1 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ -m_{21} & 1 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 \\ m_{21} & 1 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 1 & 1 - m_{21} \end{bmatrix}$$

↑ NOT UPPER TRIANGULAR NO VALUE OF m MAKES THIS UPPER TRI.

AS A SING, NO LU FACT. OF A EXISTS

$$U = E_1 A$$

$$E_1 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} 0 \\ m_{21} \end{bmatrix} \begin{bmatrix} 1 & 0 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} - \begin{bmatrix} 0 & 0 \\ m_{21} & 0 \end{bmatrix}$$

$$= \begin{bmatrix} 1 & 0 \\ -m_{21} & 1 \end{bmatrix}$$

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