Name: Solutions

Compute the LU factorization of

$$A = \begin{pmatrix} 2 & 2 & 1 \\ 2 & 3 & 2 \\ 6 & 8 & 8 \end{pmatrix}.$$

That is, find an upper triangular matrix U and a lower triangular matrix L with ones on the diagonal such that $A = LU$.

$$\begin{pmatrix} \boxed{2} & 2 & 1 \\ 2 & 3 & 2 \\ 6 & 8 & 8 \end{pmatrix} \longrightarrow \begin{pmatrix} 2 & 2 & 1 \\ 0 & \boxed{1} & 1 \\ 0 & 2 & 5 \end{pmatrix}$$

$$\longrightarrow \begin{pmatrix} 2 & 2 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 3 \end{pmatrix}$$

$$\Rightarrow U = \begin{pmatrix} 2 & 2 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 3 \end{pmatrix}$$

$$\Rightarrow L = \begin{pmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ 3 & 2 & 1 \end{pmatrix}.$$