Worksheet 4: LU factorization

Example 0.25. Use the following LU factorization

$$\underbrace{\begin{bmatrix} 3 & -7 & -2 \\ -3 & 5 & 1 \\ 6 & -4 & 0 \end{bmatrix}}_{\mathbf{A}} = \underbrace{\begin{bmatrix} 1 & & \\ -1 & 1 & \\ 2 & -5 & 1 \end{bmatrix}}_{\mathbf{L}} \cdot \underbrace{\begin{bmatrix} 3 & -7 & -2 \\ & -2 & -1 \\ & & -1 \end{bmatrix}}_{\mathbf{U}}$$

to solve the system of linear equations

$$\mathbf{Ax} = \mathbf{b}, \quad \mathbf{b} = \begin{bmatrix} -7 & 5 & 2 \end{bmatrix}^T$$

Example 0.26. Find the LU decomposition of

$$\mathbf{A} = \begin{bmatrix} 3 & -7 & -2 \\ -3 & 5 & 1 \\ 6 & -4 & 0 \end{bmatrix}$$

Example 0.27. Find the LU decomposition of

$$\mathbf{A} = \begin{bmatrix} 1 & -2 & -4 & -3 \\ 2 & -7 & -7 & -6 \\ -1 & 2 & 6 & 4 \\ -4 & -1 & 9 & 8 \end{bmatrix}$$