Linear Algebra 2
Assignment # 6

Textbook Problems:

3D: 11,18

Additional Problems:

1. Solve the system $A\mathbf{x} = \mathbf{b}$ using the given LU decomposition:

$$A = \begin{bmatrix} 2 & -1 & 2 \\ -6 & 0 & -2 \\ 8 & -1 & 5 \end{bmatrix}, \quad \mathbf{b} = \begin{bmatrix} 1 \\ 0 \\ 4 \end{bmatrix}$$

$$A = LU = \begin{bmatrix} 1 & 0 & 0 \\ -3 & 1 & 0 \\ 4 & -1 & 1 \end{bmatrix} \begin{bmatrix} 2 & -1 & 2 \\ 0 & -3 & 4 \\ 0 & 0 & 1 \end{bmatrix}$$

2. Find an LU factorization of the matrix:

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

3. Find the LUP factorization for the following matrix A, where $PA = LU$:

$$A = \begin{bmatrix} 0 & 2 & 3 \\ 1 & 4 & 7 \\ 2 & 5 & 9 \end{bmatrix}$$