MATH 232: Engineering Mathematics
Reading Guide for LAS, Section 1.5: LU Factorization

Goals: 1. To be able to find all solutions to a matrix problem $Ax = b$ (for a given $b$) using forward/backward substitution given a permutation matrix $P$, a nonsingular lower triangular matrix $L$, and an echelon matrix $U$ satisfying $LU = PA$.

2. To understand the role of elementary matrices $E_{ij}$ in Gaussian elimination.

3. To gain greater comfort with the idea that $AB$ has rows which are linear combinations of the rows of $B$.

Read: Section 1.5 of LAS

Terms to know:
- elementary matrix, permutation matrix, $LU$ factorization, row operations (of Gaussian elimination), forward/backward substitution

Questions you should be able to answer:

1. When solving $Ax = b$ using an $LU$ factorization, which comes first: forward substitution or backward?