Homework 3 Hints and Suggestions

Question 1

- Note that the E1, E2, and E3 elementary matrices are the matrices generated in Example 1. You can suppress those matrices.
- Describe specifically what changed when you multiplied E1*A, E2*A, and E3*A. If certain rows or columns changed, tell me specifically what changed.

Question 2

- Remember that E1, E2, and E3 are all TYPE III elementary matrices.
- Hint: E1 should turn the (2,1) element into a 0, E2 should turn the (3,1) element into a 0, and E3 should turn the (3,2) element into a 0. Then when you multiply E3*E2*E1*A, you have an upper triangular matrix.
- Don't forget to do part (b). To verify that L is a lower triangular matrix with ones along the diagonal, either show me or state that you can see L is a lower triangular matrix with ones on the diagonal. Also verify that A = L*U.

Question 3

- Note that E is the permutation matrix defined in the Lab. You can suppress this matrix.
- Compute E*A and A*E and describe in words how the matrices are related. Be specific!
- For part (b), remember that E^T is the transpose of E, which in Matlab is '. Compute E inverse and E transpose. Notice they are also permutation matrices. Don't forget to describe in words what else you notice!

Question 4

- Don't forget to verify that P*A = L*U.
- To solve the system, don't forget to have P*b!
- Remember that the x solution is the computed solution and the z solution is the exact solution. So for part (c), you are comparing the two solutions. You should get a very small number.

Question 5

- Please suppress the matrices in this exercise!
- Don't forget that when using tic, toc, you want all of the commands in one line. So when you calculate part (b), you should find L,U,P, solve for y, and solve for x all in one line.
- Notice that x_rref and x_lu are just variable names. This is very similar to question 1 in Lab 2, but you called the solutions x and y.