ECSE597/ECSE472
Assignment #1

Question #1 (Hand computation)

Consider the matrix A

$$A = \begin{bmatrix} 2 & 4 & 6 & 2 & 1 \\ 4 & 9 & 14 & 8 & 8 \\ 2 & 6 & 12 & 12 & 21 \\ 4 & 10 & 20 & 17 & 32 \\ 8 & 17 & 30 & 18 & 34 \end{bmatrix}$$

1. Use the Doolittle algorithm to decompose the matrix into L and U such that $A = LU$. Show intermediate results after each row and each column.
2. Use the Gaussian version of the Doolittle algorithm to decompose the matrix into L and U such that $A = LU$. Show the intermediate steps after each sub-matrix.
3. Comment on the similarities and difference between the above two methods.

Note: You can type the assignment but you do not need to. You can scan your written work and submit a pdf.

Question #2 (Matlab Program)

Write a matlab function *doolittleLU* such that [L,U]=doolittleLU(A) returns the LU decomposition of A using the Doolittle algorithm. The algorithm need not do any pivoting.

Submit the matlab .m file as your answer.

Question #3

Write a matlab function *gaussianLU* such that [L,U]=gaussianLU(A) returns the LU decomposition of A using the Gaussian version of the Doolittle algorithm. The algorithm need not do any pivoting.

Submit the matlab .m file as your answer.