Electric Networks: Computer Aided Analysis and Simulation
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Problem Sheet 4   November 2020

1. Implementation of algorithms for solving linear equation systems.

a) **5 points** Write a MATLAB function to implement the Crout factorization method. The input of the function will be a matrix. The output of the function will be a factorized matrix containing elements of a lower and am upper triangular matrix.

b) **5 points** Write a MATLAB function to implement forward and back substitution to solve an equation system of the form $LUv = j$. The inputs of the function will be the elements of L, U, and j. The output will be v.

2. **2 points** Given is:

$$Y = \begin{pmatrix} 3 & 1 & 2 & 0 \\ 1 & 7 & 2 & 4 \\ 2 & 2 & 4 & 0 \\ 0 & 4 & 0 & 4 \end{pmatrix} \quad \text{and} \quad j = \begin{pmatrix} 6.2 \\ 14.6 \\ 8.4 \\ 8.0 \end{pmatrix}.$$

Solve the equation $Y v = j$ using the programs established in the preceding task 2.