

1. Construct the L/U algorithm using the Crout decomposition, using the same notation as in class.
2. For the following system of linear equations
  - a) Solve using Gauss elimination
  - b) Develop the LU factors and calculate the determinant
  - c) Resolve using L and U for the RHS provided

$$2x_1 + 4x_2 - x_4 = b_1$$

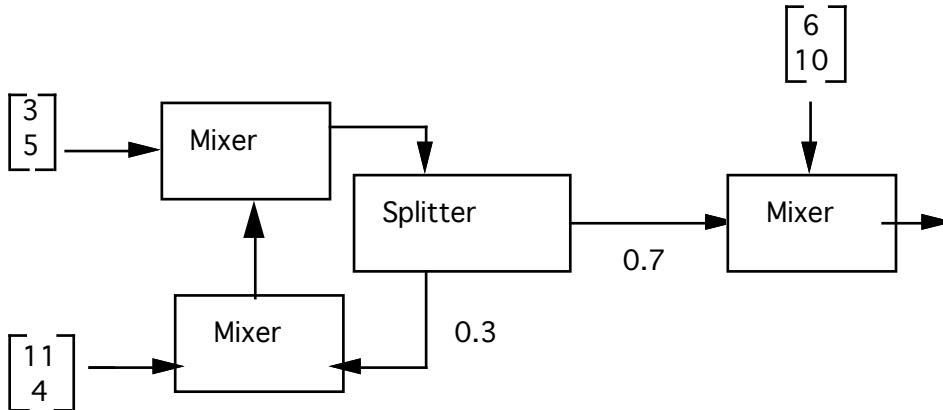
$$-x_3 + x_4 = b_2$$

$$x_1 + 6x_2 + 7x_3 = b_3$$

$$x_1 + x_4 = b_4$$

$$\underline{b}^T = (3, 2, 5, 4)$$

3. Retrieve the LU and QR decomposition programs from LINPACK in NETLIB and solve problem 2 again using both procedures. Alternately, MathCAD or MATLAB may be used.
4. Derive the linear balance equations for the problem



- a) Develop pivot sequences using the Markowitz criterion. Indicate the number of new non-zero elements created in developing L and U.
- b) For this case calculate L and U and solve the material balance equations.