Q2

4: By the function elimMat and function myLU, we can get the L and U. After we have the matrix of lower and upper, we substitute back into forward and backward substitution to compute for x and y.

5: The result from ex2.13 using my code (lab1q2_test) was

A=[1 2 2; 4 4 2; 4 6 4];

b=[3;6;10];

and the result I got was y=[3;-6;1] x=[-1,3,-1]

The result using my own matrix (lab1q2_test2) are y=[3;9;19] x=[31,28,19] with

A=[1 -1 0; -1 2 -1; 0 -1 2];

b=[3;6;10];

Q3

1: I used myLU and the matlab build in operator '\' to compare the solution. After shows two images, the shape of the first one (using myLU) is a line, and the shape of the second one looks more likely to the image showing under question description. Therefore, using build in operator seems to present a better solution.

The reason might be that the matlab build up LU uses partial pivoting with a permutation matrix P as it said at the help center page. And my LU uses forward and backward substitution.

2: run lab1q3_2.m

I made up total of 28 beams and keep 16 beams to get a 4x4 grids. The results I got is similar as it in 1.
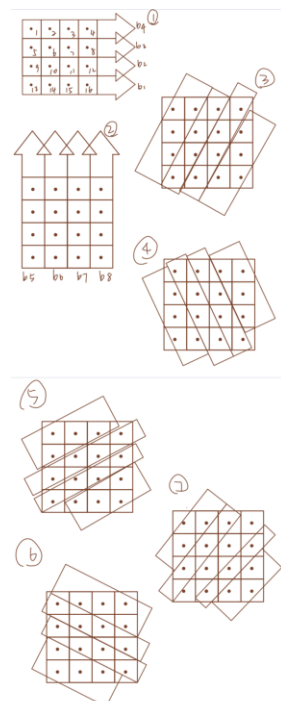
3a: run lab1q3_3a.m By comparing the three pictures, the x1_with_noice is closer to the original image., and x2_with_noice is also closer to the original image.

The differences are:
1: we add noise to matrix A and then compute x.
2: we add noise to x2 directly.
Based on my knowledge and understanding, a noise(blurred) picture would be more blurred after several times of reshape. Therefore, if we first add noise to the matrix A and then compute for the x, the pictures will be not that clear comparing to the original pictures. But if we first compute x and then add noise to the x directly, then it will be more clear.
3b: run lab1q3_3b.m The word is 'SCIENCE'.