MATH 416, HW 3, FALL 2014

1. Generate a random 5×7 matrix using, e.g., rand(5,7) command in MATLAB, or similar. Describe the linear span of the column and row vectors, respectively. Are the column (resp., row) vectors linearly independent?

2. Are there matrices $A, B \in Mat(3,3)$ satisfying $AB + BA = Id$? If yes, give an example; if not, explain why.

3. Let L be the 2-dimensional plane in $\mathbb{R}^3$ described by the relation $x + y + z = 0$. Find the matrix representation of the orthogonal projection onto L.

4. Implement the Gaussian elimination with partial pivoting algorithm in MATLAB or similar. Apply this algorithm to solve your favorite (non-triangular) system of 10 equations with 10 unknowns.