Mathematics for Machine Learning

Homework II

Due 11/11/2017

1. If the square matrix A is not invertible, why is it "likely" that the inhomogeneous equation is inconsistent? "Likely", in this case, means that the system should be inconsistent for a $\boldsymbol{y}$ chosen at random

2. If A and B are square matrices of the same size, then $det(AB) = det(A)det(B)$

   (a) Prove this last statement (Hint the elementary matrices).

3. If A is an upper triangular matrix with one or more 0's on the main diagonal, then $det(A) = 0$.

4. Show that A is invertible $\Leftrightarrow det(A) \neq 0$.

5. Implement the calculus of the determinant using the echelon idea.

6. Implement the algorithm to obtain inverses from squared matrices using jupyter notebook.