Assignment #3

Due Friday 17 September, 2021 at the start of class

Please read Lectures 2, 3, and 4 in the textbook *Numerical Linear Algebra* by Trefethen and Bau. Then do the following exercises.

P8. On page 12 of the textbook, equation (2.4) says $(AB)^* = B^*A^*$. Prove this by showing that the matrix entries are equal.

P9. On page 21 of the textbook, equation (3.10) gives a formula for the ∞-norm of an $m \times n$ matrix. Prove it:

$$\|A\|_\infty = \max_{1 \le i \le m} \|a_i^*\|_1.$$

Exercise 2.6 in Lecture 2.

Exercise 3.2 in Lecture 3.

Exercise 3.3 in Lecture 3. Do parts (a) and (b) only.

Exercise 4.3 in Lecture 4. Use the `svd` command on A. Write a MATLAB/OCTAVE (or PYTHON, JULIA, ...) `function` of the form `vismat(A)`. Start by checking that the input matrix A is in fact 2×2, and that its entries are real. Correctness of the program is more important than figure appearance.