

Homework Assignment 5. Due Thursday March 12.

1. **(5 pts)** Prove that the modified and the classic Gram-Schmidt orthogonalization processes (CGS and MGS, respectively) are equivalent. (See Cameron's lecture notes `LinearAlgebra.pdf` and/or J. Demmel's book "Applied Numerical Linear Algebra", chapter 3, page 107.)
2. **(5 pts)** Calculate the singular value decomposition for the matrix

$$A = \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}.$$

3. **(5 pts)** Prove items (5) and (7) in Theorem 3 in Cameron's lecture notes `LinearAlgebra.pdf`.