

Due date:

Saturday, 5/1, due 6pm, submit on-line through Canvas.

Instructions:

Students are encouraged to work together and discuss the homework problems, however each student must write up the solutions in their own words. Homework solutions should be well-explained.

The format of HW is not restricted, but the PDF file is the preferred one.

Problems:

Problem 1: Find Full SVD and Reduced SVD for the matrix

$$A = \begin{pmatrix} 1 & 1 \\ 0 & 1 \\ 1 & 0 \\ 1 & 1 \end{pmatrix}$$

Problem 2: Use the pseudoinverse to find the least squares solution of minimal norm to the following system $Ax = b$:

$$\begin{aligned}x + y &= 1, \\y &= 2, \\x &= 7, \\x + y &= 2,\end{aligned}$$

where A is the same as problem 1 and $b = (1, 2, 7, 2)^T$

Problems in [1]:

Pages 435–436, Using matrix

$$\begin{pmatrix} 1 & 2 & 0 \\ 2 & 8 & 2 \\ 0 & 2 & 1 \end{pmatrix}$$

to do both problem 8.5.1 and problem 8.5.2 (A typo in the problem, it means Chapter 3, instead of Chapter 5),

Pages 438–440, problems 8.5.15(b,d), 8.5.17(b)

Pages 443, problems 8.5.34

Pages 464–465, problems 8.7.13, 8.7.14(a–c), 8.7.15, 8.7.17

Pages 466–467, problems 8.7.26(a)

The following problems are suggested hw problems, which you do not need

to turn in. However, it is strongly recommended that you do all those problems as this will help you understand the material.

Pages 464–465, problems 8.7.4(a), 8.7.5 (do it for 8.7.4(a) only),

Pages 466–467, problems 8.7.35 (a)(c),

References

- [1] Peter Olver and Chehrzad Shakiban, Applied Linear Algebra, 2nd Edition