

The singular value decomposition of:

Lecture 14: SVD
Finding $\|A\|_2$

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

is given by:

$$U\Sigma V^T = \begin{bmatrix} 0.9571 & 0.2898 \\ 0.2898 & -0.9571 \end{bmatrix} \begin{bmatrix} \overset{\sigma_1}{2.3028} & 0 \\ 0 & 1.3028 \end{bmatrix} \begin{bmatrix} 0.2898 & 0.9571 \\ 0.9571 & -0.2898 \end{bmatrix}^T$$

What is $\|A\|_2$?

Imp Theorem: If $A = U\Sigma V^T$ (SVD of A), then: $\|A\|_2 = \sigma_1$

$$\therefore \|A\|_2 = 2.3028 \quad \#$$