Linear Algebra by Gilbert Strang - Notes

Syed Khalid

November 22, 2021

1 Ch-1 Matrices and Gaussian Elimination

1.1 Introduction

For solving a system of linear equations, we represent it in matrix form:

$$\begin{aligned} a_{11}x_1 + a_{12}x_2 + \dots a_{1n}x_n &= b_1 \\ a_{21}x_1 + a_{22}x_2 + \dots a_{2n}x_n &= b_2 \\ &\vdots\vdots \\ a_{m1}x_1 + a_{m2}x_2 + \dots a_{mn}x_n &= b_m \end{aligned}$$

as,

$$\equiv \begin{pmatrix} a_{11} & a_{12} & \dots a_{1n} \\ a_{21} & a_{22} & \dots a_{2n} \\ \vdots & \vdots & \ddots \\ a_{m1} & a_{m2} & a_{mn} \end{pmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_3 \end{bmatrix} = \begin{bmatrix} b_1 \\ b_2 \\ \vdots \\ b_m \end{bmatrix}$$

1.2 Geometry of Linear Equation