EE5609 Assignment 2

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***Abstract*—This assignment involves finding the matrix X by solving the equation.**

The python code solution can be downloaded from

https://github.com/Vaibhav11002/EE5609/blob/master/Assignment_2/Codes/assignment_2.py

1 Problem

Find $\mathbf{X}$ if $\mathbf{Y} = \begin{pmatrix} 3 & 2 \\ 1 & 4 \end{pmatrix}$ and $2\mathbf{X} + \mathbf{Y} = \begin{pmatrix} 1 & 0 \\ -3 & 2 \end{pmatrix}$

2 Solution

We have,

$$2\mathbf{X} + \mathbf{Y} = \begin{pmatrix} 1 & 0 \\ -3 & 2 \end{pmatrix} \tag{2.0.1}$$

$$\implies 2\mathbf{X} = \begin{pmatrix} 1 & 0 \\ -3 & 2 \end{pmatrix} - \mathbf{Y} \tag{2.0.2}$$

$$2\mathbf{X} = \begin{pmatrix} 1 & 0 \\ -3 & 2 \end{pmatrix} - \begin{pmatrix} 3 & 2 \\ 1 & 4 \end{pmatrix}$$

$$= \begin{pmatrix} -2 & -2 \\ -4 & -2 \end{pmatrix} \tag{2.0.3}$$

Now,

$$\mathbf{X} = \frac{1}{2}\begin{pmatrix} -2 & -2 \\ -4 & -2 \end{pmatrix} \tag{2.0.4}$$

$$= \begin{pmatrix} -2/2 & -2/2 \\ -4/2 & -2/2 \end{pmatrix}$$

$$= \begin{pmatrix} -1 & -1 \\ -2 & -1 \end{pmatrix} \tag{2.0.5}$$

Thus from (2.0.5) we get,

$$\boxed{\mathbf{X} = \begin{pmatrix} -1 & -1 \\ -2 & -1 \end{pmatrix}}$$