Chapter 2: Exercise Set

Exercise 2.1

Consider the following matrices,

$$\boldsymbol{A} = \begin{bmatrix} 1 & 3 & 5 \\ 2 & 4 & 6 \\ 0 & 8 & 2 \end{bmatrix} \tag{1}$$

$$\boldsymbol{B} = \begin{bmatrix} 7 & 2 \\ 1 & 5 \\ 9 & 4 \end{bmatrix} \tag{2}$$

Calculate the following values/matrices:

(a) $A_{2,3}$

(b) $\boldsymbol{A}^T$

(c) $\boldsymbol{B}^T$

(d) $\boldsymbol{A} + \boldsymbol{A}$

(e) $2\boldsymbol{B} + 1$

(f) $\boldsymbol{A}\boldsymbol{A}$

(g) $\boldsymbol{A}\boldsymbol{B}$

(h) $\boldsymbol{A} \odot \boldsymbol{A}$

(i) $(\boldsymbol{I}_3\boldsymbol{B})\boldsymbol{I}_2$

Exercise 2.2

Write the following set of equations into the matrix form $\boldsymbol{A}\boldsymbol{x} = \boldsymbol{b}$.

$$\begin{aligned} 2x_1 + 3x_2 + x_3 + 8x_4 &= 5 \\ x_1 - x_2 + x_3 - x_4 &= 2 \\ 4x_1 + 5x_3 - 2x_4 &= -4 \\ 6x_1 - 5x_2 + 3x_3 - 9x_4 &= 0 \end{aligned} \tag{3}$$