MATHEMATICS FOR MACHINE LEARNING

LAB 1 – 5%

Use Python to answer the following questions.

Hand in pdf and python file to Dropbox

1) Add vectors (4,6,7) and (3,4,5)

2) What is the dimension of :

$$\mathbf{A} = \begin{pmatrix} 2 & 7 & -1 & 0 & 3 \\ 4 & 6 & -3 & 1 & 8 \end{pmatrix}$$

3) Find the Transpose of A

4) Calculate:

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix} \times \begin{bmatrix} 9 & 8 & 7 \\ 6 & 5 & 4 \\ 3 & 2 & 1 \end{bmatrix}$$

5) Find the determinant and Inverse of:

$$B = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

6) Show that C (C^{-1}) = I for C= $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}$

7) Solve the system of equations
Interpret the solution spatially

$$\begin{aligned} x_1 + x_2 + x_3 &= 3 \\ x_1 - x_2 + 2x_3 &= 2 \\ x_2 + x_3 &= 2 \end{aligned}$$

8) What is the image of the vector (3,4) using the linear transformation in question 6