Matrix Theory Assignment 3

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***Abstract*—This document contains the solution to problem No.3.10.11**

1 Problem

Evaluate the following: $\begin{vmatrix} 2 & 7 & 65 \\ 3 & 8 & 75 \\ 5 & 9 & 86 \end{vmatrix} = 0$

2 Solution

Given determinant: $\begin{vmatrix} 2 & 7 & 65 \\ 3 & 8 & 75 \\ 5 & 9 & 86 \end{vmatrix}$

$$\begin{vmatrix} 2 & 7 & 65 \\ 3 & 8 & 75 \\ 5 & 9 & 86 \end{vmatrix} \xleftrightarrow{C_3 \leftarrow C_3 - 9C_2} \begin{vmatrix} 2 & 7 & 2 \\ 3 & 8 & 3 \\ 5 & 9 & 5 \end{vmatrix} \tag{2.0.1}$$

$$\begin{vmatrix} 2 & 7 & 2 \\ 3 & 8 & 3 \\ 5 & 9 & 5 \end{vmatrix} \xleftrightarrow{C_3 \leftarrow C_3 - C_1} \begin{vmatrix} 2 & 7 & 0 \\ 3 & 8 & 0 \\ 5 & 9 & 0 \end{vmatrix} = 0 \tag{2.0.2}$$

Since C_1 and C_3 are identical in 2.0.1,So Determinant is zero.

Note: If any two row or column of determinant are **identical** ,then value of determinant is zero.

Python Code:

https://github.com/ayushkesh/Matrix−Theory−EE5609/blob/master/A2/codes/A3.ipynb

Latex codes:

https://github.com/ayushkesh/Matrix−Theory−EE5609/blob/master/A2/latex/A3.tex