Assignment 9

Matish Singh Tanwar

***Abstract*—This document contains a solution to find explicitly all 2x2 row-reduced echelon matrices.**

Download all latex-tikz codes from

https://github.com/Matish007/Matrix−Theory−EE5609−/tree/master/Assignment_9

1 Problem

Describe explicitly all 2x2 row-reduced echelon matrices.

2 SOLUTION

2x2 matrices which are row-reduced echelon matrix are:-

$$\begin{pmatrix}0&0\\0&0\end{pmatrix},\begin{pmatrix}1&0\\0&0\end{pmatrix},\begin{pmatrix}0&1\\0&0\end{pmatrix},\begin{pmatrix}1&1\\0&0\end{pmatrix},\begin{pmatrix}1&0\\0&1\end{pmatrix}$$

We will find the basis matrix out of these:-

$$c_1\begin{pmatrix}0&0\\0&0\end{pmatrix}+c_2\begin{pmatrix}1&0\\0&0\end{pmatrix}+c_3\begin{pmatrix}0&1\\0&0\end{pmatrix}+c_4\begin{pmatrix}1&1\\0&0\end{pmatrix}+c_5\begin{pmatrix}1&0\\0&1\end{pmatrix}=\begin{pmatrix}0&0\\0&0\end{pmatrix} \tag{2.0.1}$$

$$c_2+c_4+c_5=0 \tag{2.0.2}$$

$$c_3+c_4=0 \tag{2.0.3}$$

$$c_5=0 \tag{2.0.4}$$

By solving (2.0.2),(2.0.3),(2.0.4) we get linear combinaion of two matrices.We also got c_2=c_3.

$$c_2\begin{pmatrix}1&0\\0&0\end{pmatrix}+c_2\begin{pmatrix}0&1\\0&0\end{pmatrix} \tag{2.0.5}$$