

## Step-1

Suppose  $\text{column } 1 + \text{column } 3 + \text{column } 5 = 0$  in a 4 by 5 matrix with four pivots.

i.e column 5 is the combination of column 1 and column 3

Therefore, the column 5 has no pivot since it is a combination of earlier columns.

Therefore,  $x_5$  is free variable.

## Step-2

So,  $x_5$  is free variable this means that the four pivots in the other columns.

Therefore, the special solution is  $(1, 0, 1, 0, 1)$ . And the null space contains all multiples of  $(1, 0, 1, 0, 1)$ .