## Step-1

If $r$ = (rank of $C(A)$) the number of non zero columns of $A$ , $A$ be an $m$ by $n$ matrix

(a) the non homogenous system $Ax = b$ has number of solutions either 0 or 1 depending on the column $b$ if $r < m$ or $r = m$

## Step-2

(b) The number of solutions is infinite without considering the column $b$ if $r = m, r < n$

## Step-3

(c) The number of solutions is either 0 or infinite by considering the column $b$, $r < m$ or $(r = m$ such that $r < n)$

## Step-4

(d) the number of solutions of $Ax = b$ is unique without considering the column $b$ if $r = m = n$