Step-1

We have to explain that why there is no matrix whose row space and column space both contain $(1,1,1)$.

We know that the row space and null space both must are orthogonal.

So if both contain $(1,1,1)$ then $\begin{bmatrix}1 & 1 & 1\end{bmatrix}^T \begin{bmatrix}1 & 1 & 1\end{bmatrix} = 0$, but this is impossible

Therefore both row space and column space of a matrix do not contain $(1,1,1)$.