Step-1

Given that if every column of A is a multiple of $(1,1,1)$,then Ax is always a multiple of $(1,1,1)$.We have to give an example of 3 by 3 matrix and the number of pivots produced by the elimination.

Step-2

Since every column of A is a multiple of $(1,1,1)$ let $A=\begin{pmatrix}2&3&4\\2&3&4\\2&3&4\end{pmatrix}$

And let $x=(x_1,x_2,x_3)$ be the column matrix then

$$Ax=\begin{pmatrix}2&3&4\\2&3&4\\2&3&4\end{pmatrix}\begin{pmatrix}x_1\\x_2\\x_3\end{pmatrix}$$

$$=\begin{pmatrix}2x_1+3x_2+4x_3\\2x_1+3x_2+4x_3\\2x_1+3x_2+4x_3\end{pmatrix}$$

It shows that every entry in the column of Ax is multiple of$(1,1,1)$.

Step-3

$$A=\begin{pmatrix}2&3&4\\2&3&4\\2&3&4\end{pmatrix}$$

Applying R_2-R_1 and R_3-R_1 gives

$$\square\begin{pmatrix}2&3&4\\0&0&0\\0&0&0\end{pmatrix}$$

Here 2 is the only pivot.

Therefore the number of pivots after elimination is $\boxed{1}$.