Step-1

Consider the matrix;

$$A=\begin{bmatrix}1 & 2\\ 0 & 0\\ 0 & 0\end{bmatrix}$$

The column space of A is the linear combination of all columns of A.

Let,

$$\begin{bmatrix}b_1\\ b_2\\ b_3\end{bmatrix}=c_1\begin{bmatrix}1\\ 0\\ 0\end{bmatrix}+c_2\begin{bmatrix}2\\ 0\\ 0\end{bmatrix}$$

$$b_1=c_1+2c_2$$
$$b_2=0$$
$$b_3=0$$

Therefore $\left\{(b_1,b_2,b_3)\middle|\begin{bmatrix}b_1\\ b_2\\ b_3\end{bmatrix}\text{ is linear combinations of }\begin{bmatrix}1\\ 0\\ 0\end{bmatrix},\begin{bmatrix}2\\ 0\\ 0\end{bmatrix}\right\}$

Column space of A is $\boxed{\mathbf{C}(A)=\{(c_1+2c_2,0,0)/c_1,c_2\in\mathbf{R}\}}$

Therefore, column space of A is $x-$axis.

Step-2

Given that $B=\begin{bmatrix}1 & 0\\ 0 & 2\\ 0 & 0\end{bmatrix}$

Column space of B is linear combinations of vectors $\begin{bmatrix}1\\ 0\\ 0\end{bmatrix},\begin{bmatrix}0\\ 2\\ 0\end{bmatrix}$

Now, $c_1\begin{bmatrix}1\\ 0\\ 0\end{bmatrix}+c_2\begin{bmatrix}0\\ 2\\ 0\end{bmatrix}=\begin{bmatrix}c_1\\ 2c_2\\ 0\end{bmatrix}$

Therefore, the column space of B is;

$$\boxed{\mathbf{C}(B)=\{(c_1,2c_2,0)/c_1,c_2\in\mathbf{R}\}}$$

Therefore the column space of B is $x-y$ plane;

$=$ all vectors $(x,y,0)$

Step-3

Given that $C=\begin{bmatrix}1&0\\2&0\\0&0\end{bmatrix}$

The column space of C is linear combinations of columns $\begin{bmatrix}1\\2\\0\end{bmatrix},\begin{bmatrix}0\\0\\0\end{bmatrix}$

Let

$$\begin{bmatrix}b_1\\b_2\\b_3\end{bmatrix}=c_1\begin{bmatrix}1\\2\\0\end{bmatrix}+c_2\begin{bmatrix}0\\0\\0\end{bmatrix}$$
$$=\begin{bmatrix}c_1\\2c_1\\0\end{bmatrix}$$

Therefore the column space of c is;

$$\boxed{\begin{aligned}\mathbf{C}(C)&=\{(c_1,2c_1,0)/c_1\in\mathbf{R}\}\\&=\{c(1,2,0)/c\in\mathbf{R}\}\end{aligned}}$$

Therefore the column space of C is the line of vectors containing $(1,2,0)$.