$$A = \begin{bmatrix} -1 & 5 & 4 & 1 \\ 0 & 1 & 2 & 0 \\ 6 & -3 & -3 & 0 \\ 3 & 5 & 4 & 1 \end{bmatrix}$$

$$A = \begin{bmatrix} -1 & 5 & 4 & 1 \\ 0 & 1 & 2 & 0 \\ 6 & -3 & -3 & 0 \\ 3 & 5 & 4 & 1 \end{bmatrix} \therefore R^3 - R^1$$

$$\det(A) = 3(-1)^{4+1} \begin{bmatrix} 5 & 4 & 1 \\ 1 & 2 & 0 \\ -3 & -3 & 0 \end{bmatrix} + 0 + 0 + 0$$

$$\det(A) = -3 \begin{bmatrix} 5 & 4 & 1 \\ 1 & 2 & 0 \\ -3 & -3 & 0 \end{bmatrix}$$

$$\det(A) = 3((-1)^{3+1} \begin{vmatrix} 1 & 2 \\ -3 & -3 \end{vmatrix} + 0(-1)^{3+3} \begin{vmatrix} 5 & 1 \\ 4 & 3 \end{vmatrix} + 0(-1)^{3+3} \begin{vmatrix} 5 & 4 \\ 1 & 2 \end{vmatrix})$$

$$\det(A) = 3((-1)^{4} \begin{vmatrix} 1 & 2 \\ -3 & -3 \end{vmatrix} + 0 + 0)$$

$$\det(A) = -3(-3 - (-6))$$
$$\det(A) = -3(-3 + 6)$$
$$\det(A) = -3(3)$$
$$\det(A) = 9$$

check wether the matrix A is stricktly diagonally dominant or not

$-1 \geq 5 + 4 + 1 = -1 \geq 10$
$0 \geq 1 + 2 + 0 = 0 \geq 3$
$6 \geq -3 - 3 + 0 = 6 \geq 0$
$3 \geq 5 + 4 + 1 = 3 \geq 10$

the matrix A is stricktly not diagonally dominant