Step-1

$$\begin{bmatrix} 0 & 1 & 2 & 3 \\ 2 & 0 & 3 & 1 \\ 1 & 0 & 3 & 2 \\ 3 & 2 & 0 & 1 \end{bmatrix}$$

We easily see that every row contains the numbers 0, 1, 2, and 3

It is not symmetric while $1,2^{th}$ entry 1 and $2,1^{th}$ entry is 2 such that both are not equal.

The determinant of this matrix is
$$-1\begin{vmatrix} 2 & 3 & 1 \\ 1 & 3 & 2 \\ 3 & 0 & 1 \end{vmatrix} + 2\begin{vmatrix} 0 & 2 & 3 \\ 1 & 3 & 1 \\ 2 & 3 & 2 \end{vmatrix}$$

$$= (-1)(3)\begin{vmatrix} 3 & 1 \\ 3 & 2 \end{vmatrix} + (-1)(1)\begin{vmatrix} 2 & 3 \\ 1 & 3 \end{vmatrix} + 2(-1)\begin{vmatrix} 2 & 3 \\ 3 & 2 \end{vmatrix} + 2(2)\begin{vmatrix} 2 & 3 \\ 3 & 1 \end{vmatrix}$$

$$= -3(6-3) - 1(6-3) - 2(4-9) + 4(2-9)$$

$$= -9 - 3 + 10 - 28$$

$$= -29$$

$$\neq 0$$

So, the matrix is invertible and its inverse is

$$\begin{bmatrix} -1 & -\dfrac{7}{6} & \dfrac{11}{6} & \dfrac{1}{2} \\ 2 & \dfrac{17}{6} & -\dfrac{25}{6} & -\dfrac{1}{2} \\ 1 & \dfrac{11}{6} & -\dfrac{13}{6} & -\dfrac{1}{2} \\ -1 & -\dfrac{13}{6} & \dfrac{17}{6} & \dfrac{1}{2} \end{bmatrix}$$