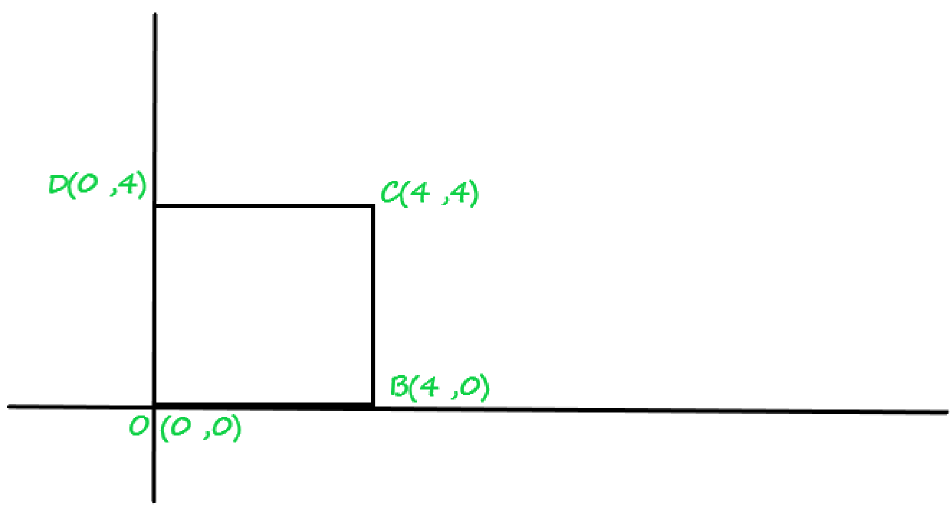
Composite Transformation :
As the name suggests itself Composition, here we combine two or more transformations into one single transformation that is equivalent to the transformations that are performed one after one over a 2-D object.
Example :
Consider we have a 2-D object on which we first apply transformation **T_1 (2-D matrix condition)** and then we apply transformation **T_2(2-D matrix condition)** over the 2-D object and the object get transformed, the very equivalent effect over the 2-D object we can obtain by multiplying **T_1 & T_2 (2-D matrix conditions)** with each other and then applying the **T_{12} (resultant of T_1 X T_2)** with the coordinates of the 2-D image to get the transformed final image.
Problem :
Consider we have a square **O(0, 0), B(4, 0), C(4, 4), D(0, 4)** on which we first apply **T1(scaling transformation) given scaling factor is Sx=Sy=0.5** and then we apply **T2(rotation transformation in clockwise direction)** it by 90*(angle), in last we perform **T3(reflection transformation about origin).**
Ans : The square O, A, C, D looks like :



First, we perform scaling transformation over a 2-D object :
Representation of scaling condition :

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} Sx & 0 \\ 0 & Sx \end{bmatrix} * \begin{bmatrix} x \\ y \end{bmatrix}$$

For coordinate O(0, 0) :

$$O\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0.5 & 0 \\ 0 & 0.5 \end{bmatrix} * \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$O\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

For coordinate B(4, 0) :

$$B\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0.5 & 0 \\ 0 & 0.5 \end{bmatrix} * \begin{bmatrix} 4 \\ 0 \end{bmatrix}$$

$$B\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 2 \\ 0 \end{bmatrix}$$

For coordinate C(4, 4) :

$$C\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0.5 & 0 \\ 0 & 0.5 \end{bmatrix} * \begin{bmatrix} 4 \\ 4 \end{bmatrix}$$

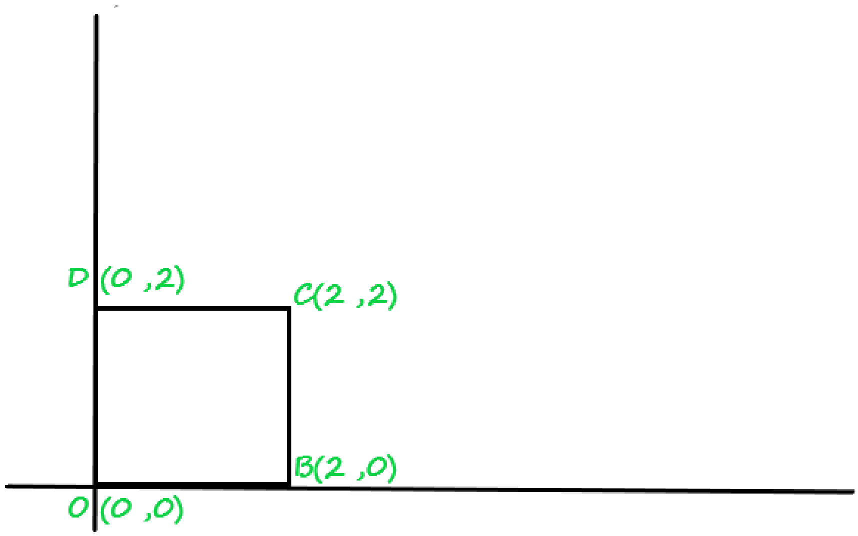
$$C\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 2 \\ 2 \end{bmatrix}$$

For coordinate D(0, 4) :

$$D\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0.5 & 0 \\ 0 & 0.5 \end{bmatrix} * \begin{bmatrix} 0 \\ 4 \end{bmatrix}$$

$$D\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 2 \end{bmatrix}$$

2-D object after scaling :



***Now, we'll perform rotation transformation in clockwise-direction on Fig.2 by 90$^{\theta}$:**
The condition of rotation transformation of 2-D object about origin is :

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} cos & sin \\ -sin & cos \end{bmatrix} * \begin{bmatrix} x \\ y \end{bmatrix}$$

$$\text{Cos}90 = 0$$
$$\text{sin}90 = 1$$

For coordinate O(0, 0) :

$$\text{O}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} * \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$\text{O}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

For coordinate B(2, 0) :

$$B\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}0 & 1\\-1 & 0\end{bmatrix}*\begin{bmatrix}2\\0\end{bmatrix}$$

$$B\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}0\\-2\end{bmatrix}$$

For coordinate C(2, 2) :

$$C\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}0 & 1\\-1 & 0\end{bmatrix}*\begin{bmatrix}2\\2\end{bmatrix}$$

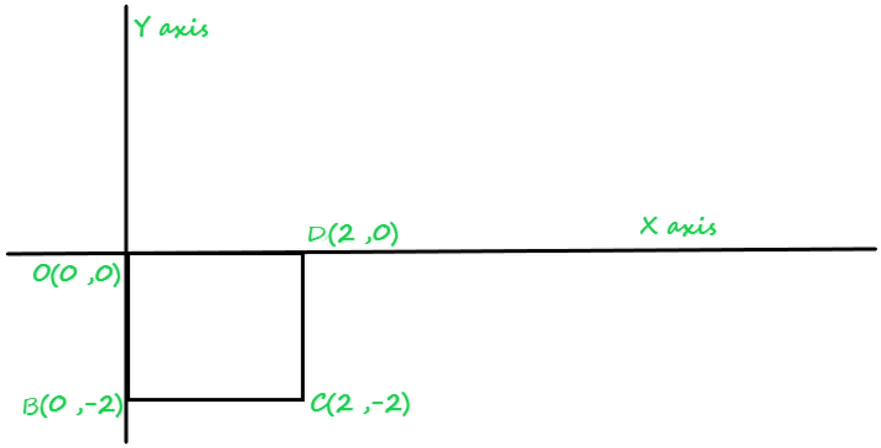
$$C\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}2\\-2\end{bmatrix}$$

For coordinate D(0, 2) :

$$D\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}0 & 1\\-1 & 0\end{bmatrix}*\begin{bmatrix}0\\2\end{bmatrix}$$

$$D\begin{bmatrix}x'\\y'\end{bmatrix}=\begin{bmatrix}2\\0\end{bmatrix}$$

2-D object after rotating about origin by 90* angle :



Now, we'll perform third last operation on Fig.3, by reflecting it about origin :

The condition of reflecting an object about origin is

$$\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix} * \begin{bmatrix} x \\ y \end{bmatrix}$$

For coordinate O(0, 0) :

$$\mathrm{O}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix} * \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$\mathrm{O}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

For coordinate B'(0, 0) :

$$\mathrm{B'}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix} * \begin{bmatrix} 0 \\ 2 \end{bmatrix}$$

$$\mathrm{B'}\begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -2 \\ 0 \end{bmatrix}$$

For coordinate C'(0, 0) :

$$C' \begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix} * \begin{bmatrix} 2 \\ -2 \end{bmatrix}$$

$$C' \begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -2 \\ 2 \end{bmatrix}$$

For coordinate D'(0, 0) :

$$D' \begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix} * \begin{bmatrix} 0 \\ -2 \end{bmatrix}$$

$$D' \begin{bmatrix} x' \\ y' \end{bmatrix} = \begin{bmatrix} 0 \\ 2 \end{bmatrix}$$

The final 2-D object after reflecting about origin, we get :