# Lab Assignment-1

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Write a code from scratch to perform the following tasks on the two test samples: [test1.png, test2.png]

[without using any libraries related to graphics]

## ① Scaling

$$\begin{bmatrix} b_x & 0 \\ 0 & b_y \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}$$

$(b_x, b_y) = (-1.75, -1.75)$

$(-1.5, 1)$

$(1, -1.5)$

$(1.75, 1.75)$

$(1.5, 1)$

$(1, 1.75)$

## ② Shear

$$\begin{bmatrix} 1 & \tan\theta \\ 0 & 1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}$$

$\theta = +60^\circ, +45^\circ, +30^\circ, +15^\circ, -15^\circ, -45^\circ, -60^\circ$

③ Rotation

$$\begin{bmatrix} \cos\phi & -\sin\phi \\ \sin\phi & \cos\phi \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix}$$

$\theta = +60^\circ, +45^\circ, +30^\circ, +15^\circ, -15^\circ, -45^\circ, -60^\circ$

④ Reflection

(about x-axis and y-axis)

⑤ Show the reflection in terms of combination of rotation and scaling transformations.

⑥ Show the shear in terms of combination of rotation and scaling transformations.