Lab Assignment-2

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1. (continuing your Lab Assignment 1, (same test images)

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

2. Similarly,

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

i.e. prove the following decomposition from the lectures.

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} = \mathbf{R}_2 \begin{bmatrix} \sigma_1 & 0 \\ 0 & \sigma_2 \end{bmatrix} \mathbf{R}_1$$

$$= \begin{bmatrix} 0.8507 & -0.5257 \\ 0.5257 & 0.8507 \end{bmatrix} \begin{bmatrix} 1.618 & 0 \\ 0 & 0.618 \end{bmatrix} \begin{bmatrix} 0.5257 & 0.8507 \\ -0.8507 & 0.5257 \end{bmatrix}$$

$$= \text{rotate } (31.7^\circ) \text{ scale } (1.618, 0.618) \text{ rotate } (-58.3^\circ).$$