Topic 1: 2D Transformation

Each image uses 24 bits to represent the color of each pixel. Eight bits are used to store the intensity of the red part of a pixel ,eight bits - the green component, and eight bits are for the blue component. Each pixel has a coordinate pair *(x,y),* which describes its position on two orthogonal axes from defined origin *O*. We're going to rotate our image around this origin.What we need to do is take the RGB values at every *(x,y)* location, rotate it as we need, and then write these values in the new location.The *(x,y)* coordinates relative to the axes are the same; what we have done is rotate the coordinate frame of reference by an angle *θ(θ - angle at which we rotate(transform) our image)*. For new coordinates(x*, y*) of values at (x, y) We use this formula:

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

We use:

library SciPy(function rotate)
matplotlib.pyplot(for representing new matrix)
matplotlib.image(for reading image)