Lab -1

CSET340- Advanced Computer Vision and Video analytics

Task-1:- Computer Graphics – 2D Scaling Transformation

Perform the basic transformation operations on a 2D-object (i.e a rectangle, triangle, square, rhombus or polygon etc.).

1. Translation
2. Scaling
3. Rotation
4. Reflection
5. Shearing of a 2-D object

Perform composite 2D-transformation: 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.

Note:- Choose any language of your convenience. (preferably C, C++, Java, Python)

For C, C++ use the **#include <graphics.h**> library and for python we can use the **import numpy as np** and for java we can use **import java.awt.geom.AffineTransform;**

Task-2:- Image Transformations using OpenCV in python

Image Transformation involves the transformation of image data in order to retrieve information from the image or preprocess the image for further usage.

OpenCV: OpenCV (Open Source Computer Vision Library) is an open-source computer vision and machine learning software library. OpenCV was built to provide a common infrastructure for computer vision applications and to accelerate the use of machine perception in commercial products. By using it, one can process images and videos to identify objects, faces, handwriting of a human etc. When it is integrated with various libraries, such as NumPy, Python is capable of processing the OpenCV array structure for analysis.

Perform the basic Perform the basic image transformation operations on the image provided:

- Image Translation
- Reflection
- Rotation

- Scaling
- Cropping
- Shearing in x-axis
- Shearing in y-axis

OR

Note:- OpenCV in colab:-

```
import cv2

print(cv2.__version__)
```