13 question

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import cv2

import numpy as np


# Step 1: Read the image

image_path = r"C:\Users\SAIL\Downloads\CV\chrismas.jpg"  # Replace with your image path

image = cv2.imread(image_path)


# Check if the image is loaded successfully

if image is None:

    print("Error: Could not load image.")

    exit()


# Step 2: Define three points in the original image

# These points are chosen arbitrarily, but they should be non-collinear

rows, cols, _ = image.shape

pts1 = np.float32([[50, 50], [200, 50], [50, 200]])


# Step 3: Define the corresponding points in the output image

# These points define where the original points should map to after transformation

pts2 = np.float32([[10, 100], [200, 50], [100, 250]])
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# Step 4: Get the Affine Transformation Matrix
# The matrix will map pts1 to pts2
matrix = cv2.getAffineTransform(pts1, pts2)

# Step 5: Apply the affine transformation
# warpAffine will apply the transformation to the entire image
transformed_image = cv2.warpAffine(image, matrix, (cols, rows))

# Step 6: Display the original and transformed images
cv2.imshow("Original Image", image)
cv2.imshow("Affine Transformed Image", transformed_image)

# Wait for a key press and close all windows
cv2.waitKey(0)
cv2.destroyAllWindows()
```