Task – 1

You have to write an efficient code for detecting a tennis ball using Canny edge detection and Hough transform. The goal is to accurately identify the ball's circular shape while minimizing errors and optimizing performance. (You can use blurring , masking, *parameter tunning* etc for optimizing your code ).

import cv2

import numpy as np

import matplotlib.pyplot as plt

image\_path = 'path\_of\_image.jpg'

img = cv2.imread(image\_path, cv2.IMREAD\_COLOR)

gray = cv2.cvtColor(img, cv2.COLOR\_BGR2GRAY)

gray\_blurred = cv2.GaussianBlur(gray, (9, 9), 2)

edges = cv2.Canny(gray\_blurred, 50, 150)

circles = cv2.HoughCircles(edges, cv2.HOUGH\_GRADIENT, dp=1.2, minDist=30,

param1=50, param2=30, minRadius=15,

maxRadius=50)

if circles is not None:

circles = np.round(circles[0, :]).astype("int")

for (x, y, r) in circles:

cv2.circle(img, (x, y), r, (0, 255, 0), 4)

cv2.rectangle(img, (x - 5, y - 5), (x + 5, y + 5), (0, 128, 255), -1)

img\_rgb = cv2.cvtColor(img, cv2.COLOR\_BGR2RGB)

plt.imshow(img\_rgb)

plt.title('Tennis Ball')

plt.axis('off')

plt.show()