

```

# Importing necessary libraries
import cv2
import numpy as np
from google.colab.patches import cv2_imshow

# Initializing necessary counters
one_rupee = 0
two_rupee = 0

# Reading the image
image = cv2.imread("/content/ME03-P1.jpeg")

# Display the original image
cv2_imshow(image)

# Converting the given image to grayscale
gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

# Display the grayscale image
cv2_imshow(gray)

# Applying Gaussian Blur to minimize noise and help in circle
detection
gray_blurred = cv2.GaussianBlur(gray, (5, 5), 0)

# Display the blurred image
cv2_imshow(gray_blurred)

# Using Hough Circles to detect the circles
circles = cv2.HoughCircles(
    gray_blurred, cv2.HOUGH_GRADIENT, dp=1, minDist=40, param1=130,
    param2=35, minRadius=100, maxRadius=137
)

# If circles are found, iterating through them
if circles is not None:
    circles = np.uint16(np.around(circles))

    # Calculate the scaling factor (pixels to cm)
    image_width_pixels = 938
    real_width_cm = 10
    scale = real_width_cm / image_width_pixels

    diameters_cm = []

    for i in circles[0, :]:
        # Get circle parameters: the center and the radius
        center = (i[0], i[1])
        radius = i[2]

```

```

    # Calculating the diameter in cm
    diameter_cm = 2 * radius * scale
    diameters_cm.append(diameter_cm)

    # Printing the circle parameters and area
    print(f"Circle at {center} with diameter {2*radius} pixels,
which is approximately {diameter_cm:.2f} cm.")

    # Drawing the circle on the original image with its
denomination
    cv2.circle(image, center, radius, (0, 255, 0), 3)
    if diameter_cm > 2.4: # Assuming 2 rupee coins are larger
than 2.4 cm in diameter
        two_rupee += 1
        text = f"2 Rupee coin, {diameter_cm:.2f} cm."
    else:
        one_rupee += 1
        text = f"1 Rupee coin, {diameter_cm:.2f} cm."

    font = cv2.FONT_HERSHEY_SIMPLEX
    font_size = 0.46 # Reduced font size
    font_thickness = 1 # Reduced font thickness
    font_color = (255, 255, 255)
    cv2.putText(image, text, (i[0], i[1]), font, font_size,
font_color, font_thickness)

    # Displaying the result
    cv2.imshow(image)
    print(f"Number of 2 Rupee Coins: {two_rupee}")
    print(f"Number of 1 Rupee Coins: {one_rupee}")
    print(f"Net Value: {(two_rupee * 2) + (one_rupee * 1)}")
    print(f"Diameters in cm: {diameters_cm}")
else:
    print('No circles found.')

# Additional coin counting
if circles is not None:
    circles = np.round(circles[0, :]).astype("int")
    num_coins = len(circles)
    print(f"Number of coins detected: {num_coins}")
else:
    print("No circles (coins) were found.")

```







Circle at (528, 1248) with diameter 272 pixels, which is approximately 2.90 cm.

Circle at (660, 774) with diameter 248 pixels, which is approximately 2.64 cm.

Circle at (768, 1050) with diameter 212 pixels, which is approximately 2.26 cm.

Circle at (202, 906) with diameter 214 pixels, which is approximately 2.28 cm.

Circle at (388, 1308) with diameter 208 pixels, which is approximately 2.22 cm.



Number of 2 Rupee Coins: 2

Number of 1 Rupee Coins: 3

Net Value: 7

Diameters in cm: [2.899786780383795, 2.6439232409381663,
2.260127931769723, 2.281449893390192, 2.2174840085287846]

Number of coins detected: 5