Original image:
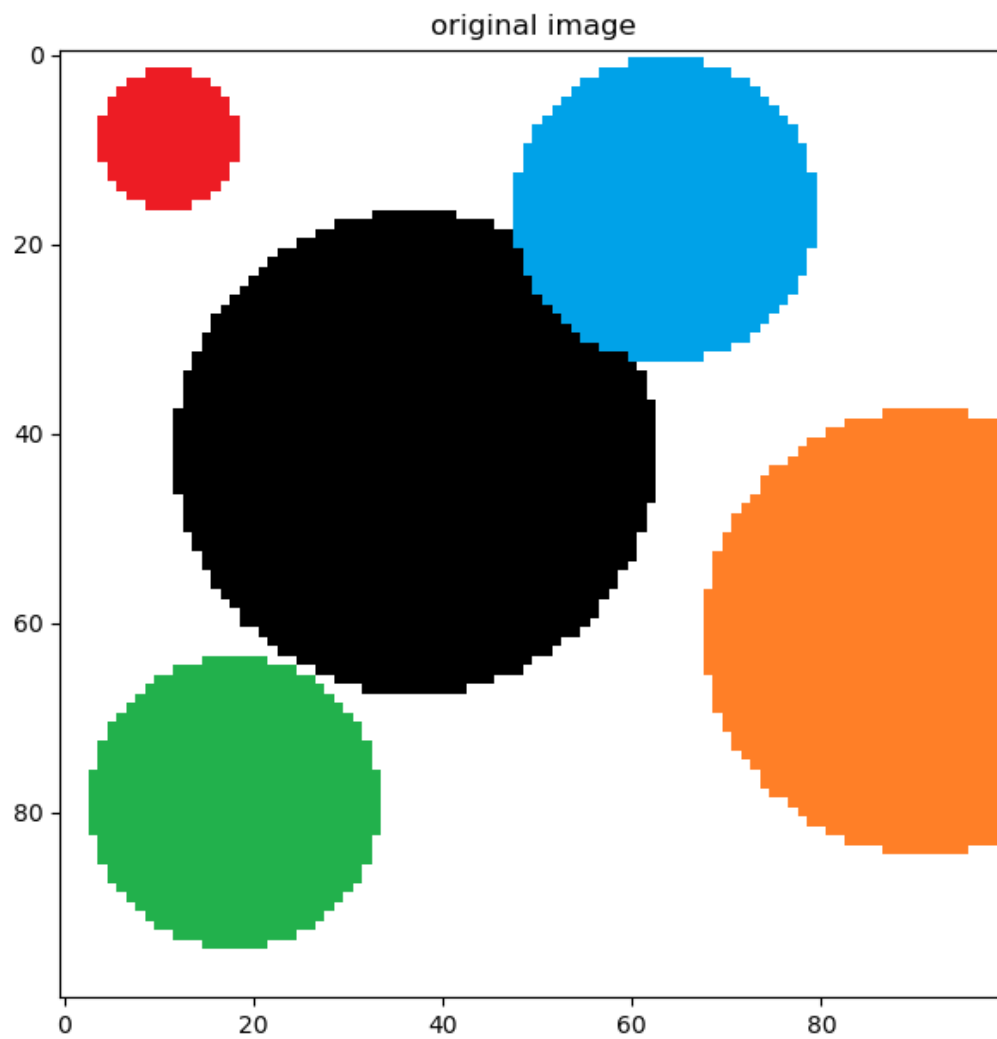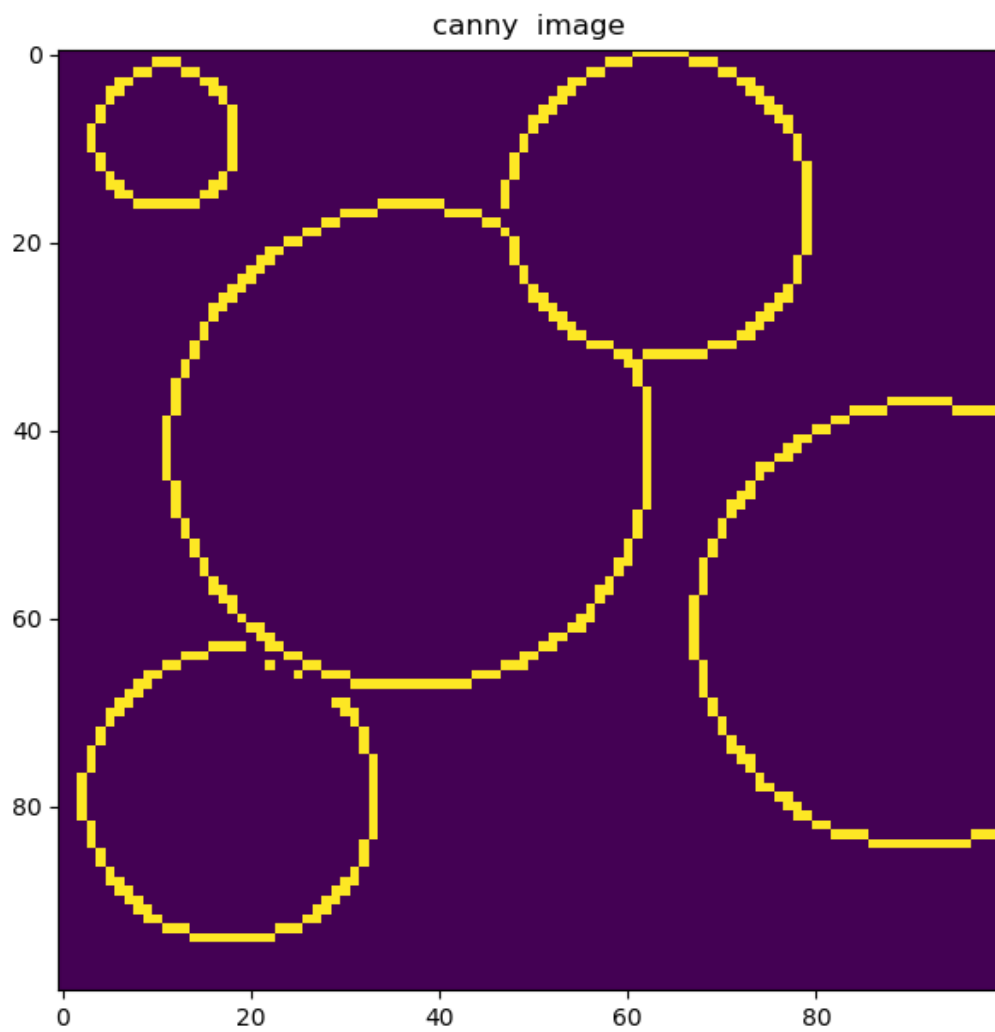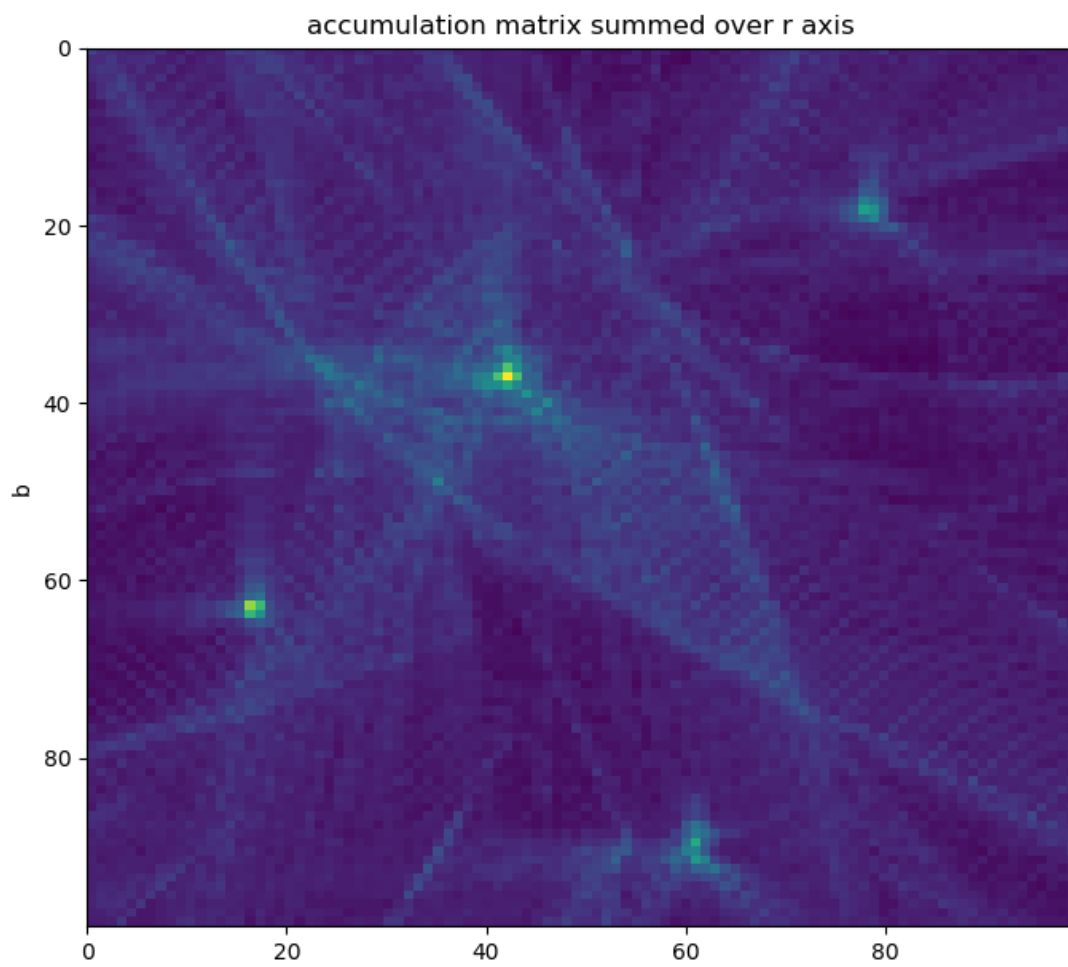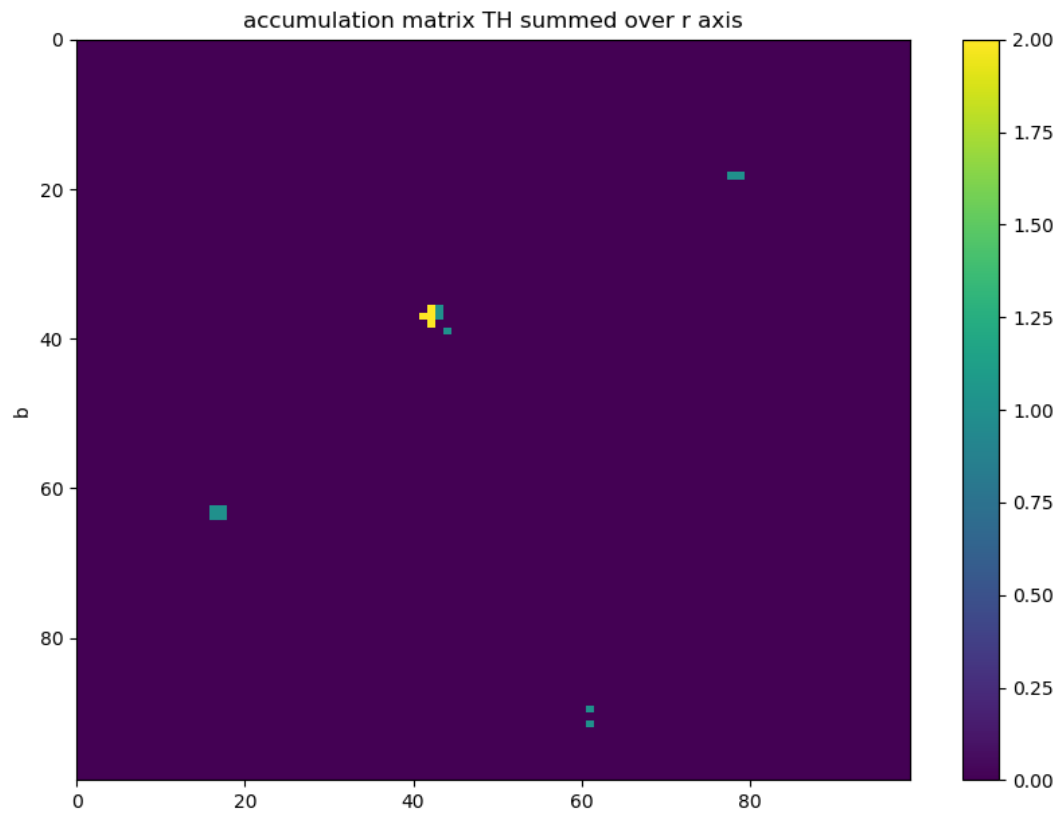

original image

Filtered image after using a Canny filter:
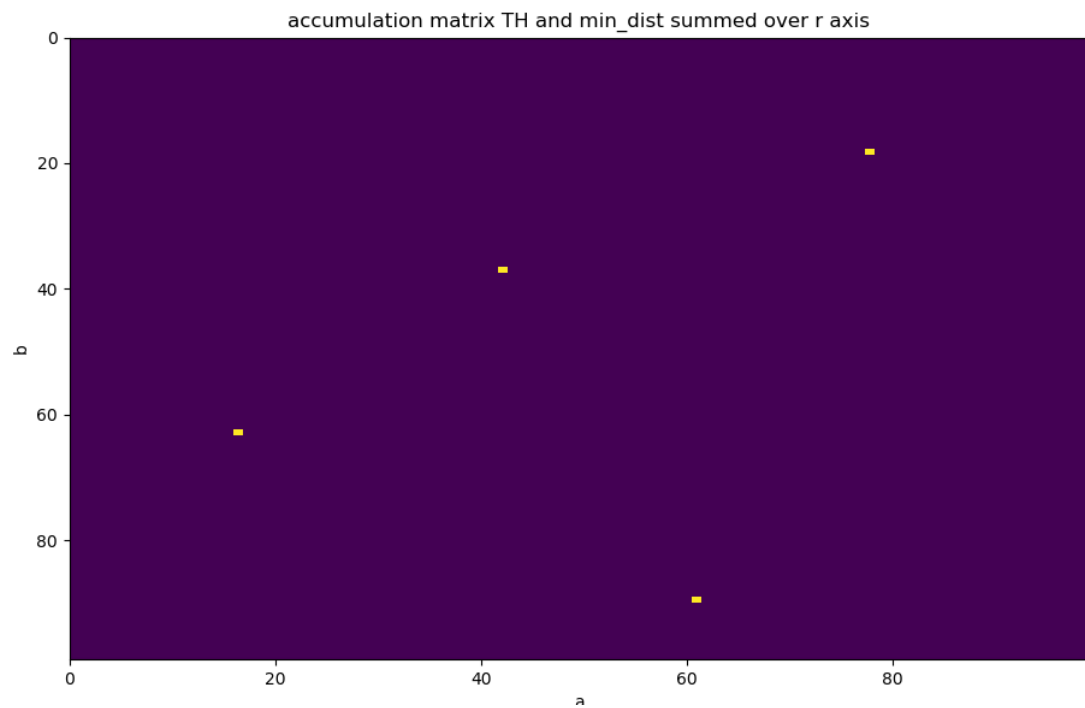
canny image

The following is the accumulation matrix, as viewed there's about 4 points with most votes, which later become the circle detected on the original image:
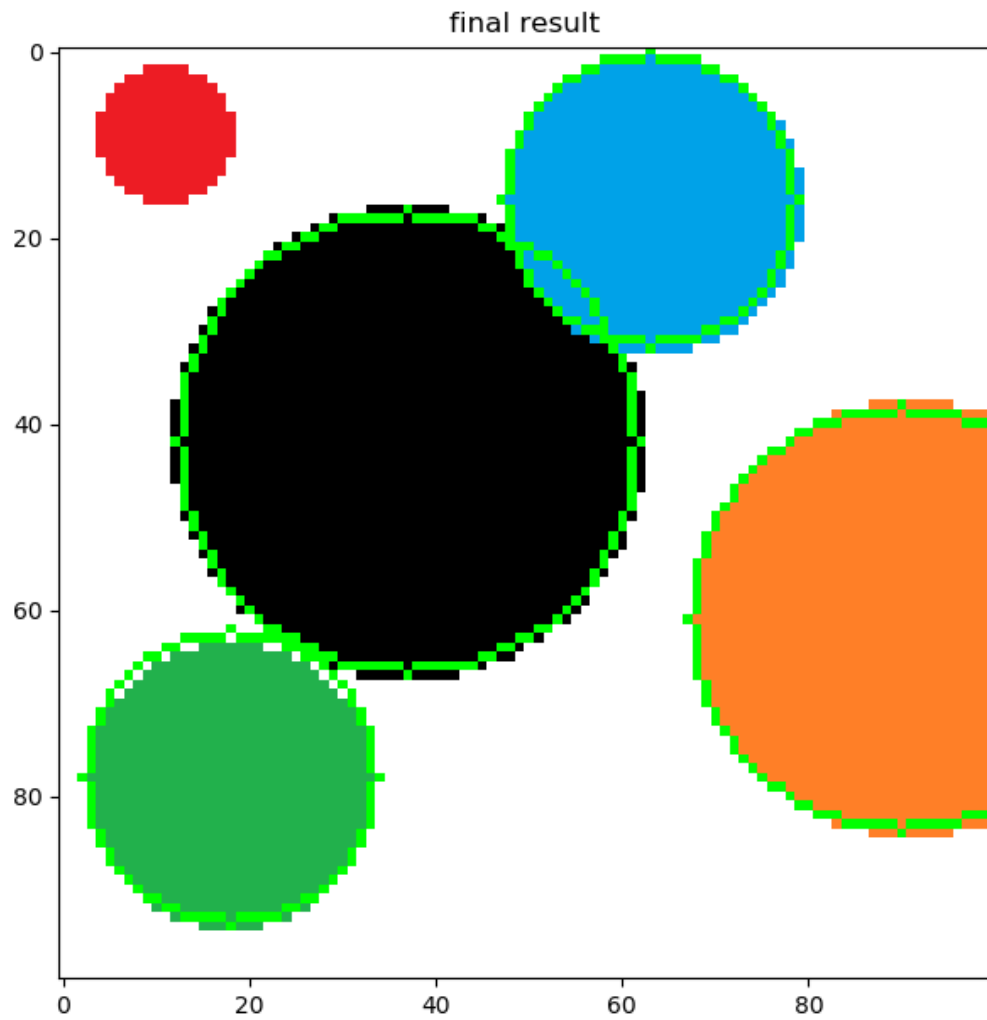
accumulation matrix summed over r axis

And the last threshold accomultion image after cleaning excess noise, and defining minimum distance of 15:
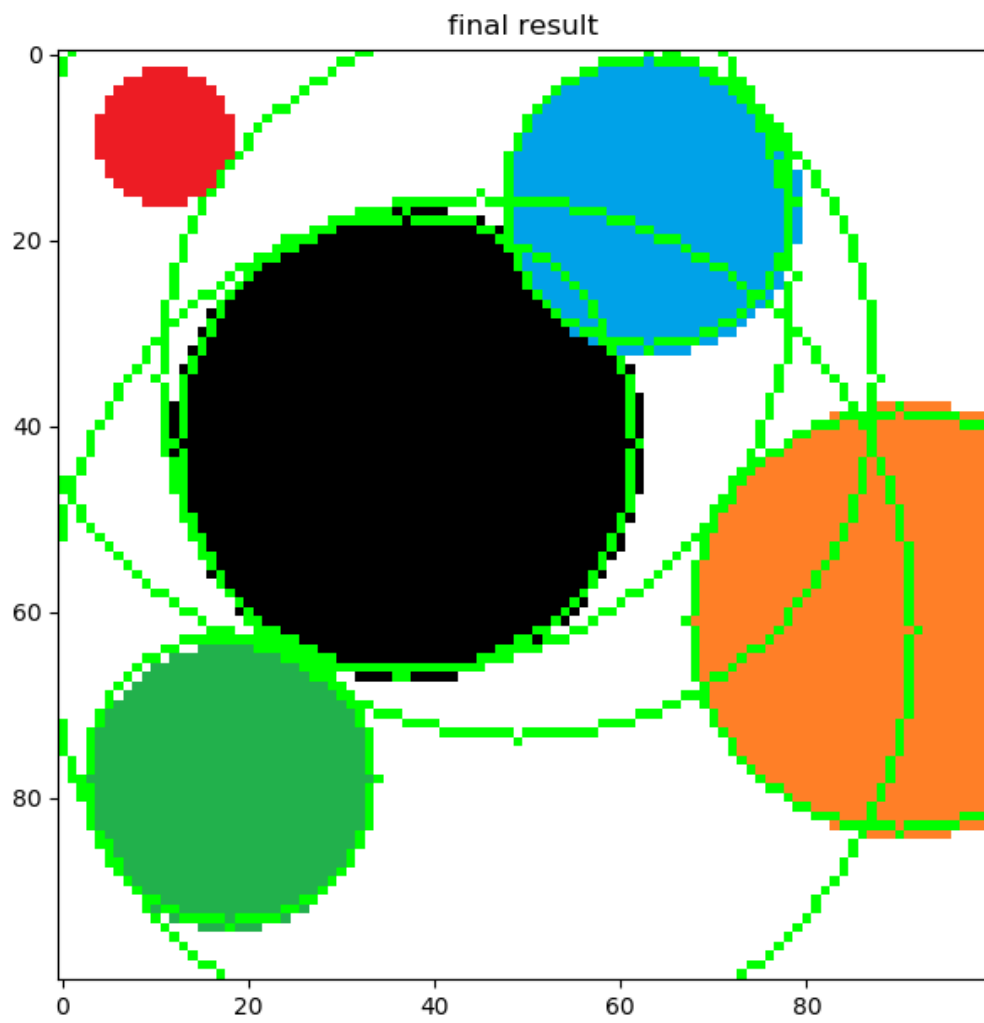
After applying the HoughCircle algorithm(not cv.2HoughCircle), I got the following image, using threshold of 50:
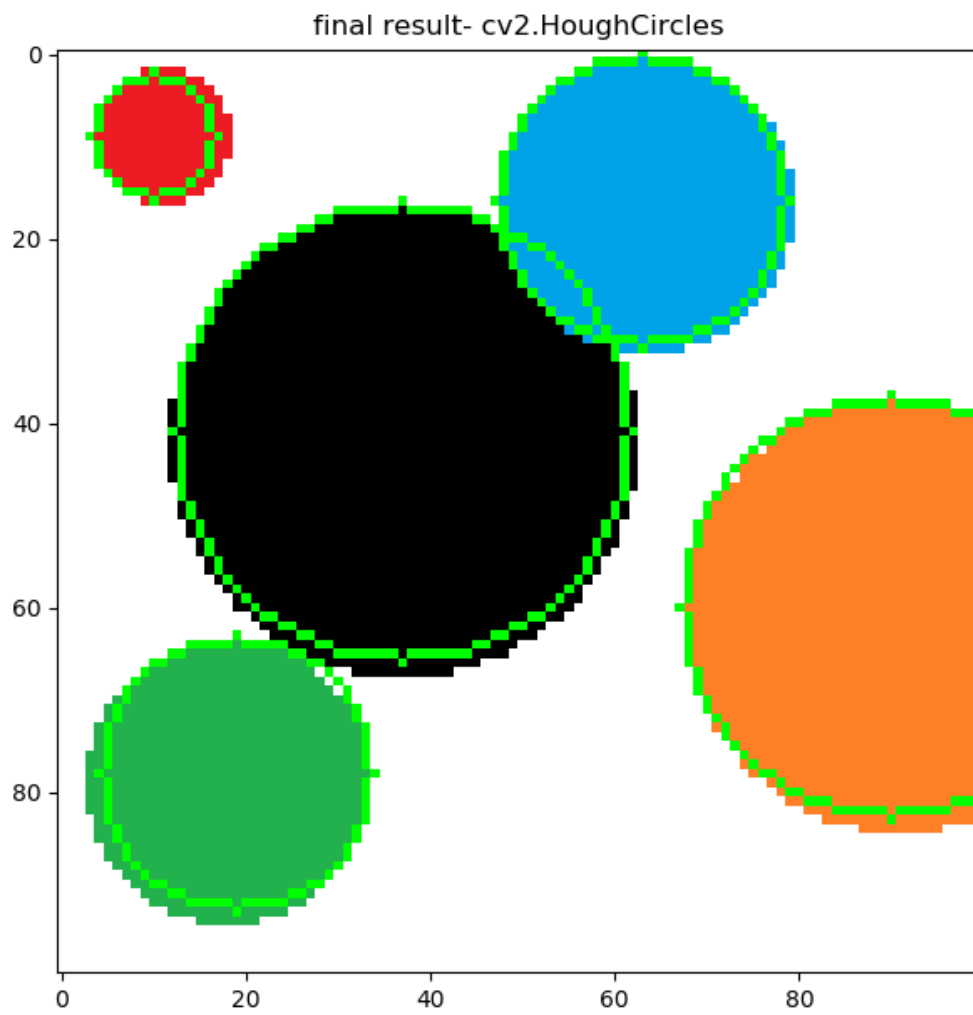

final result

When using Threshold of less than 50 we'll get a bad result, due to the much more noise that was not filtered, as the following image shows, here I used threshold of 35, accomulation matrix:

accumulation matrix TH summed over r axis
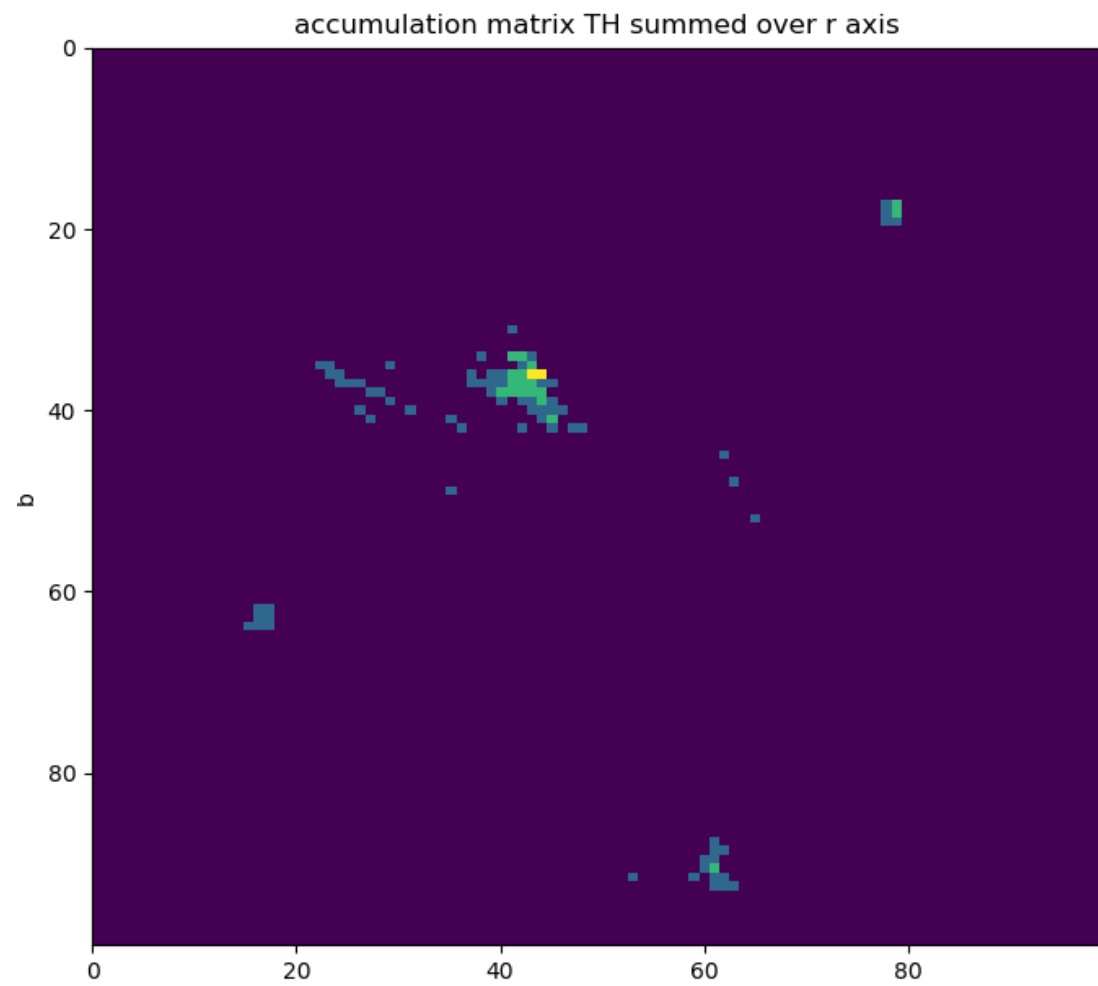
And Finale result with threshold of 35:
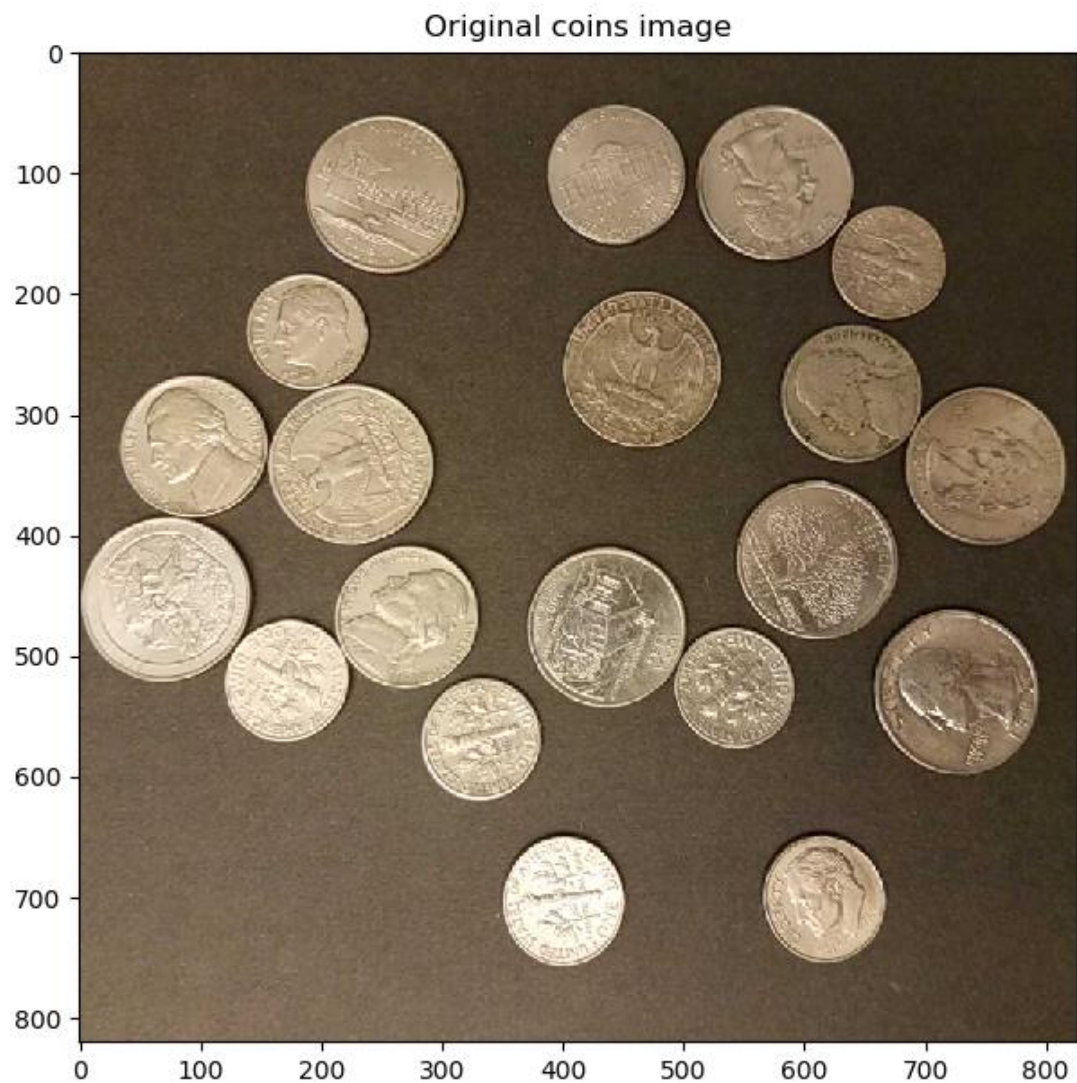

final result

Result after using cv.2HoughCircles:

final result- cv2.HoughCircles

Part 2:

Original coins image

After applying the HoughCircle filter with 3 if statements, which determine the radius of each element and managed to distinguish and got 3 different sizes, as the following images show, there are 3 types of coins:

final result- coins detection