***Project 1: Identify if the shape in a 20x20 pixel image (white solid shape on black background) is a rectangle or not***

Approach 1:

The image will be extracted from the following lines:

import cv2

img = cv2.imread*(*"ML\_Data/Untitled.png", 1*)*

An excel sheet is made with a 20 by 20 space set to 0s. In a loop, value of pixels is extracted using

B, G, R = img *[*i, j*]*

As the image is black and white, one of the colors is taken and floor divided by 255 to get 0 or 1. Then it is multiplied by the corresponding weightage stored in the excel sheet and all of the products is added. If the sum is greater than the set bias, the output neuron is fired and user feedback is taken. If the output neuron fires when it shouldn’t, the weightage of white pixels is subtracted by 0.05. If it doesn’t fire when it should, weightage of white pixels is added by 0.05.

Approach 2: (22nd May 2022)

The black pixels, instead of being 0 are now taken as 0.125. when the output neuron fires when it shouldn’t, the weightage of black pixels is added by 0.0125 and when it doesn’t when it should, weight is added by 0.0125.

Failure of Approach 2:

When a very small shape was taken, the output neuron did not show the correct answer no matter how many times the feedback was given as the weightage of the black pixels became large due to their number and took a long time to get changed.

***Project 2: Recognize a handwritten digit made on a 27x27 pixel screen (white drawing on a black background)***

Approach 1: (28th May 2022)

Ten excel sheets are created with a 27 by 27 space is set to 0s. A matrix M1 is created to store them with order 10 x (27\*27). One of the colors of each pixel is taken and divided by 255. The value is stored in another column (27\*27) x 1 matrix M2. Their matrix product represents the activations of the output neurons. The neuron with the highest activation is the output digit.

If the output digit is wrong, the weightages of the output digit is subtracted by its pixel value and the weightages of the correct digit is added by its pixel value.