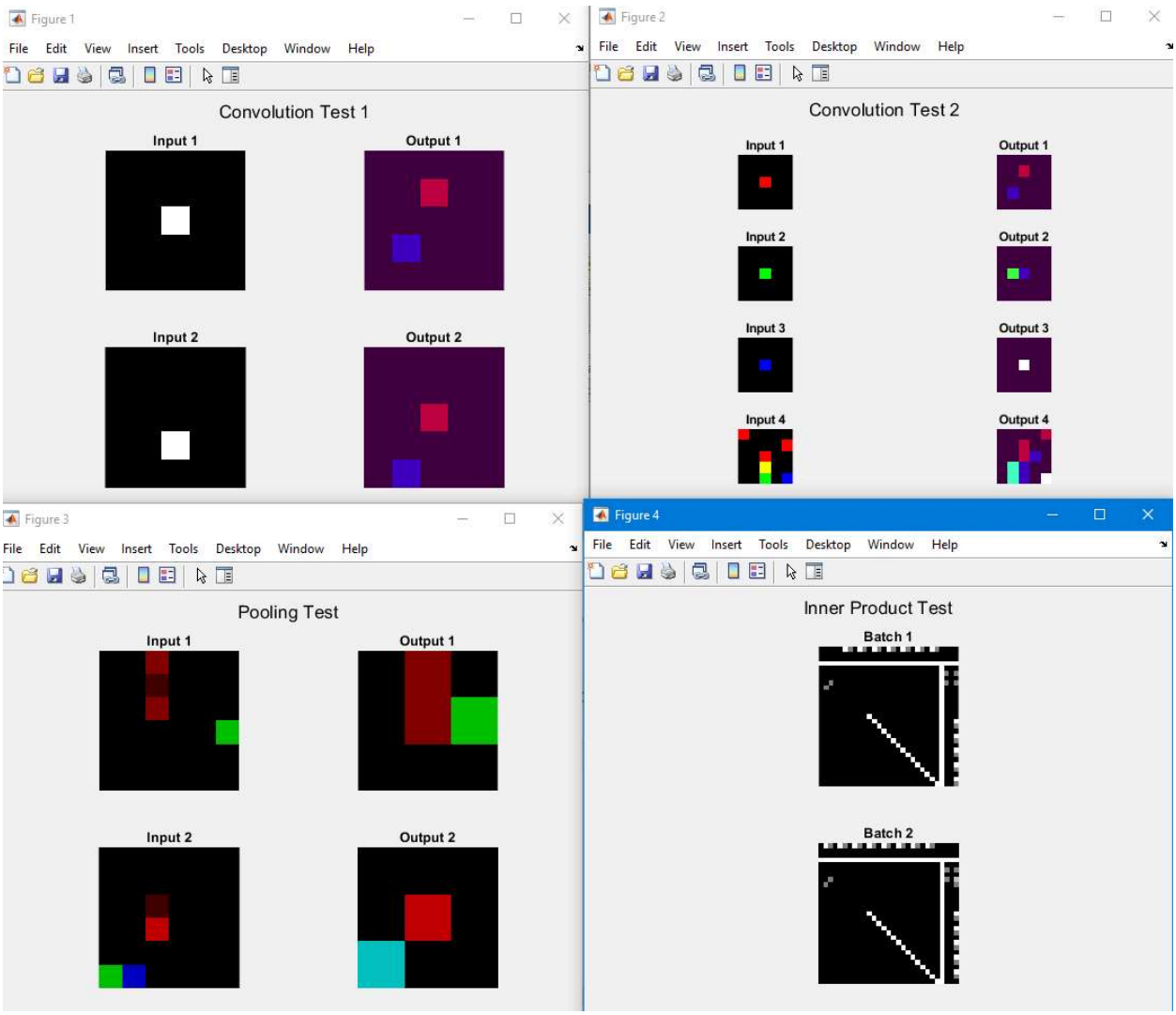
Part 1:



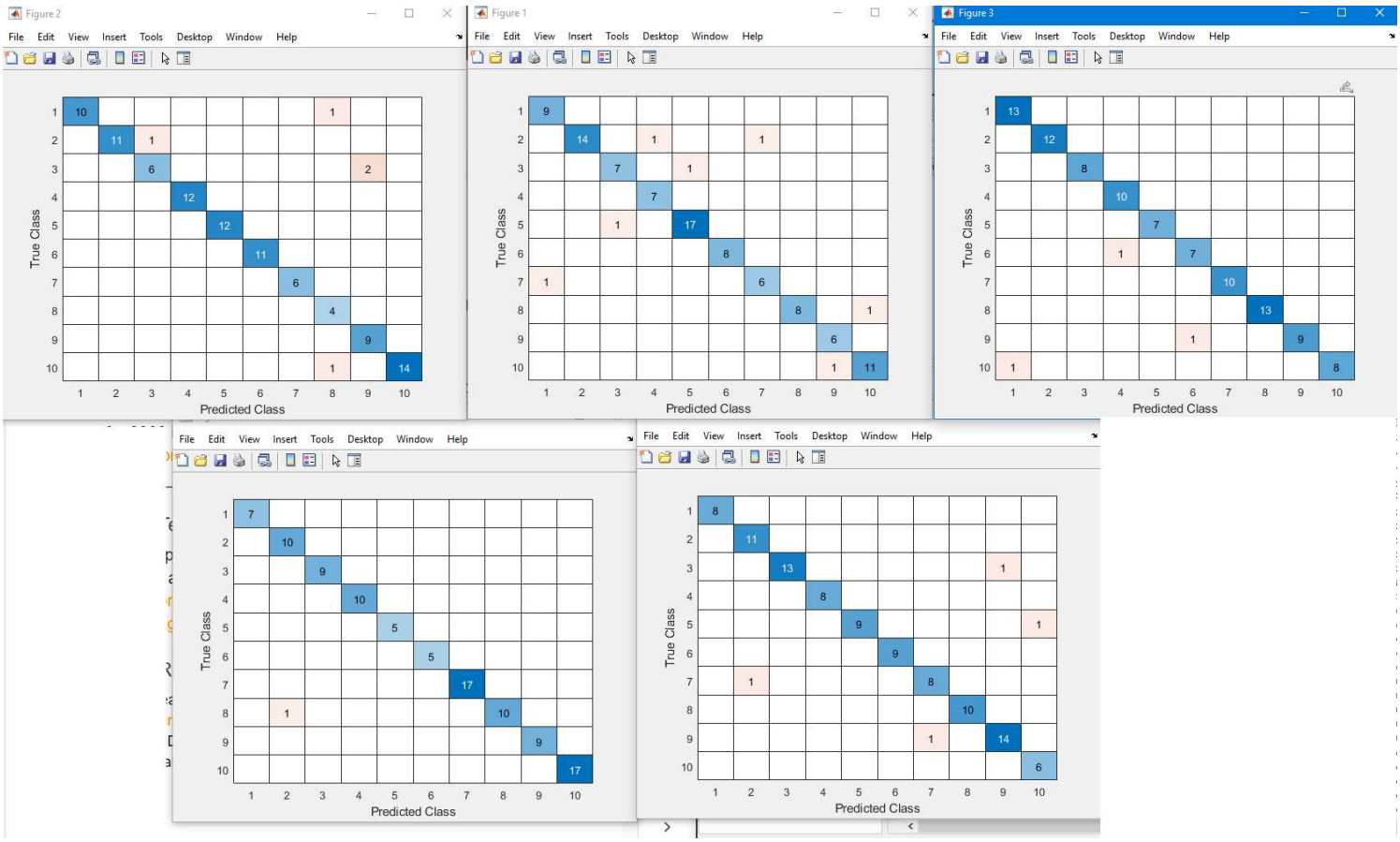
Part 3:

3.1

cost = 0.273307 training_percent = 0.910000

test accuracy: 0.970000

3.2



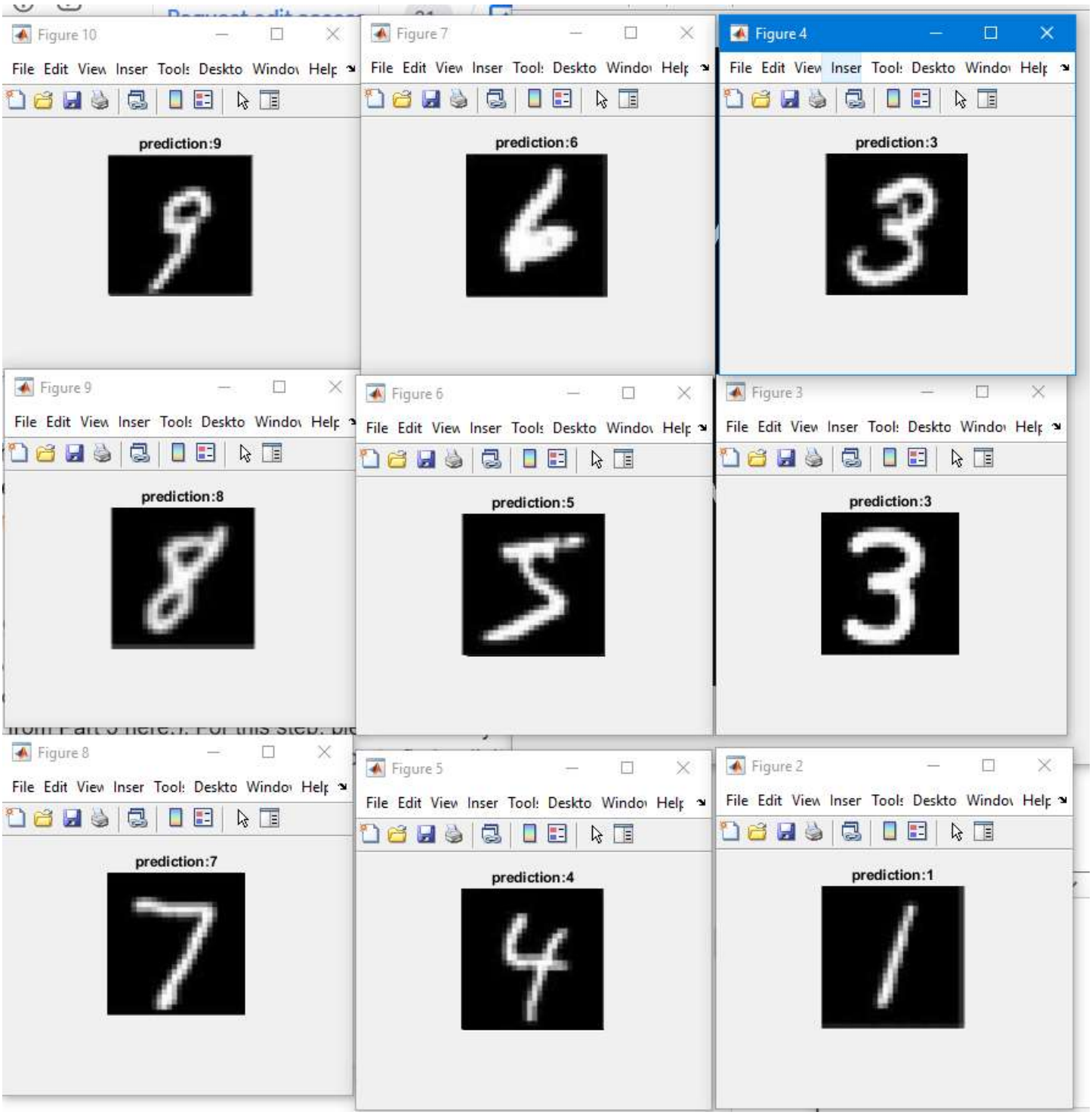
The numbers of the diagonals represent the predictions that were correct. The 5 matrices are generated for 5 different images.

The worst outcomes are for number 9: 4 errors

And for 8: 2 errors

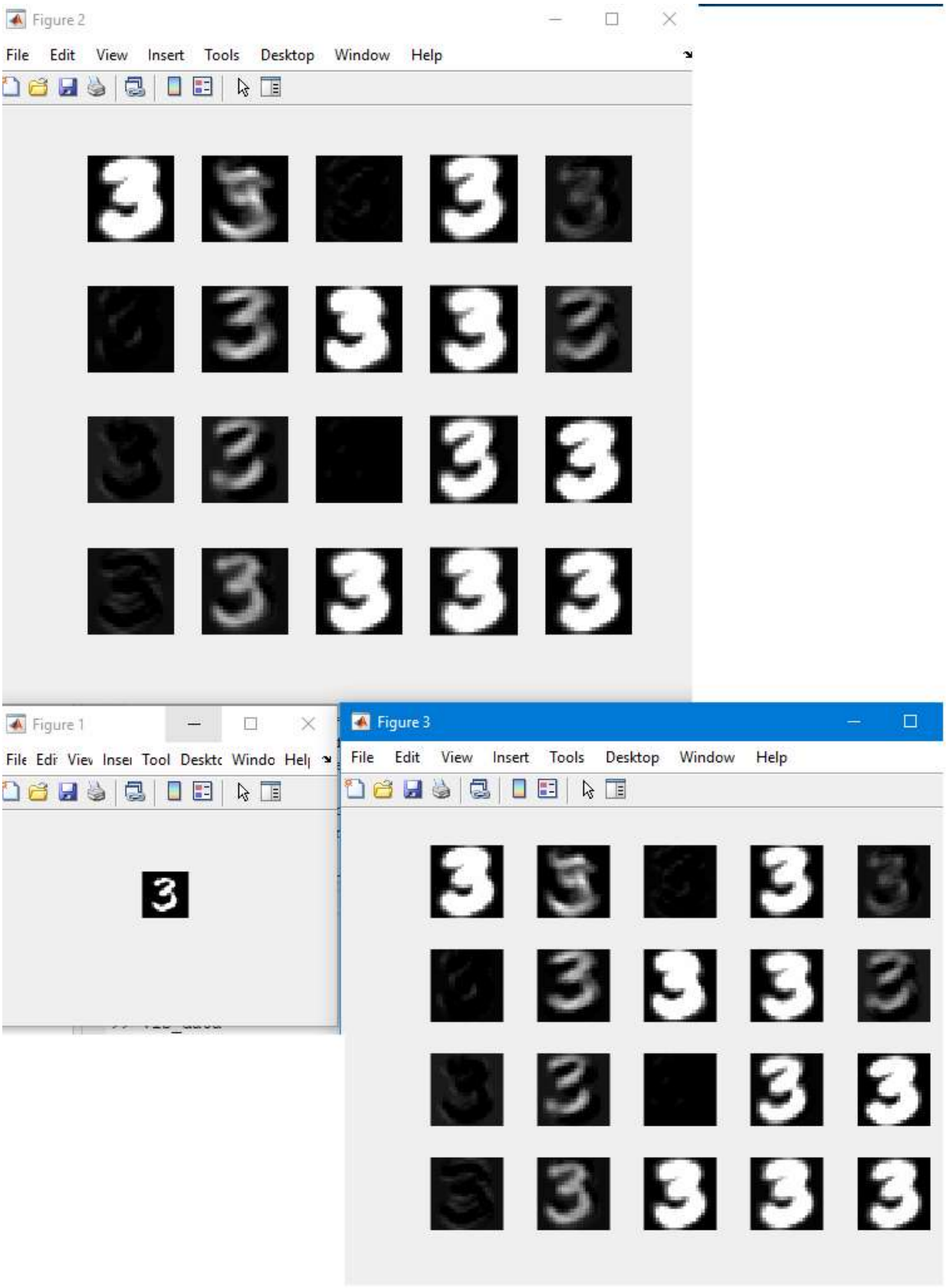
The prediction accuracy however is above 95%

3.3



These were some images I found online for testing. The Accuracy was 100%

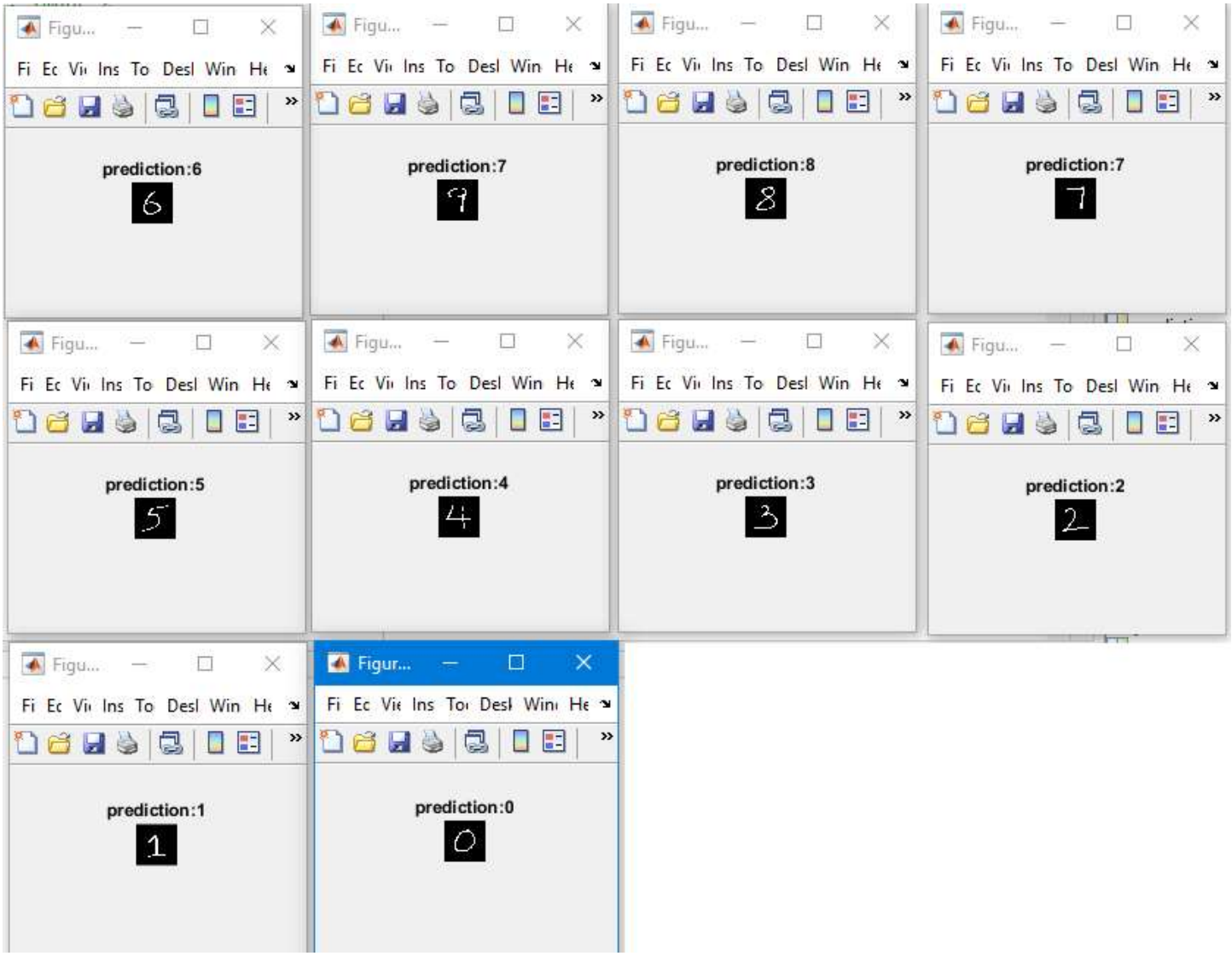
4.1



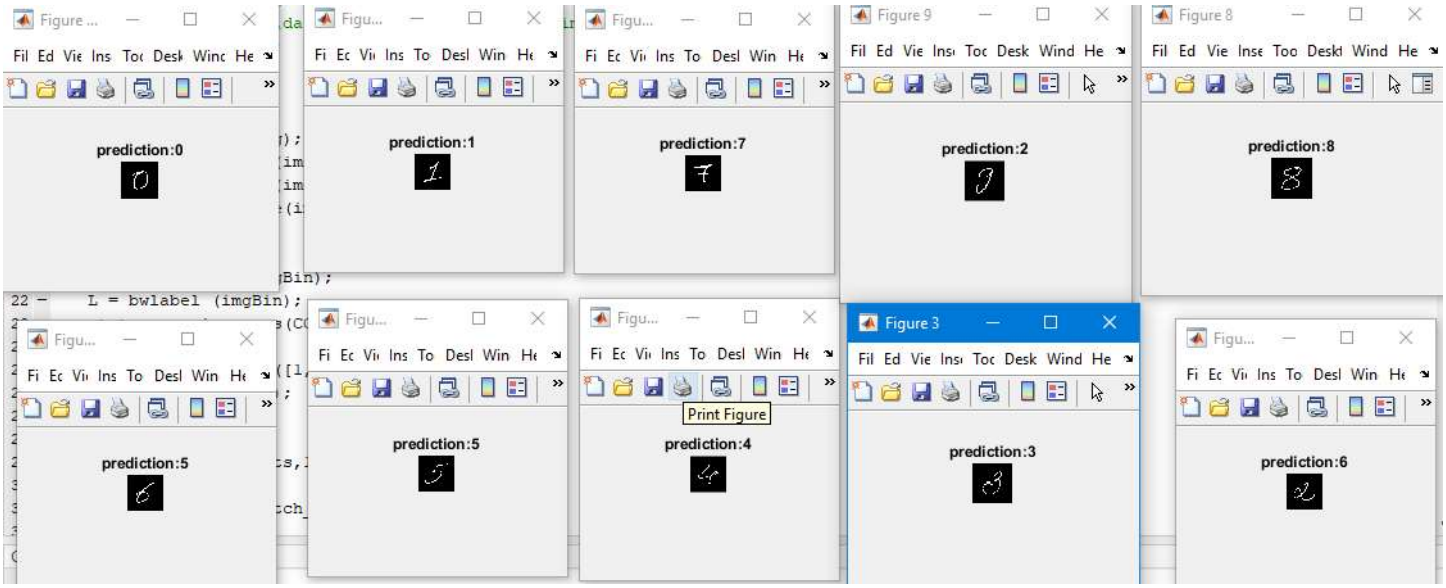
We can see the Original Image in the bottom left , the top image is the conv output and the one in bottom right is relu.

4.2 Conv is able to decipher the edges in the images, it has bolded strokes, shallow strokes, fuzzy strokes and complete darkness. Relu layer is able to detect this as well and the output looks the same because the negative values are all converted to zero. The original input is larger than the input and hence the partial recognition by the said layer in the activation map.

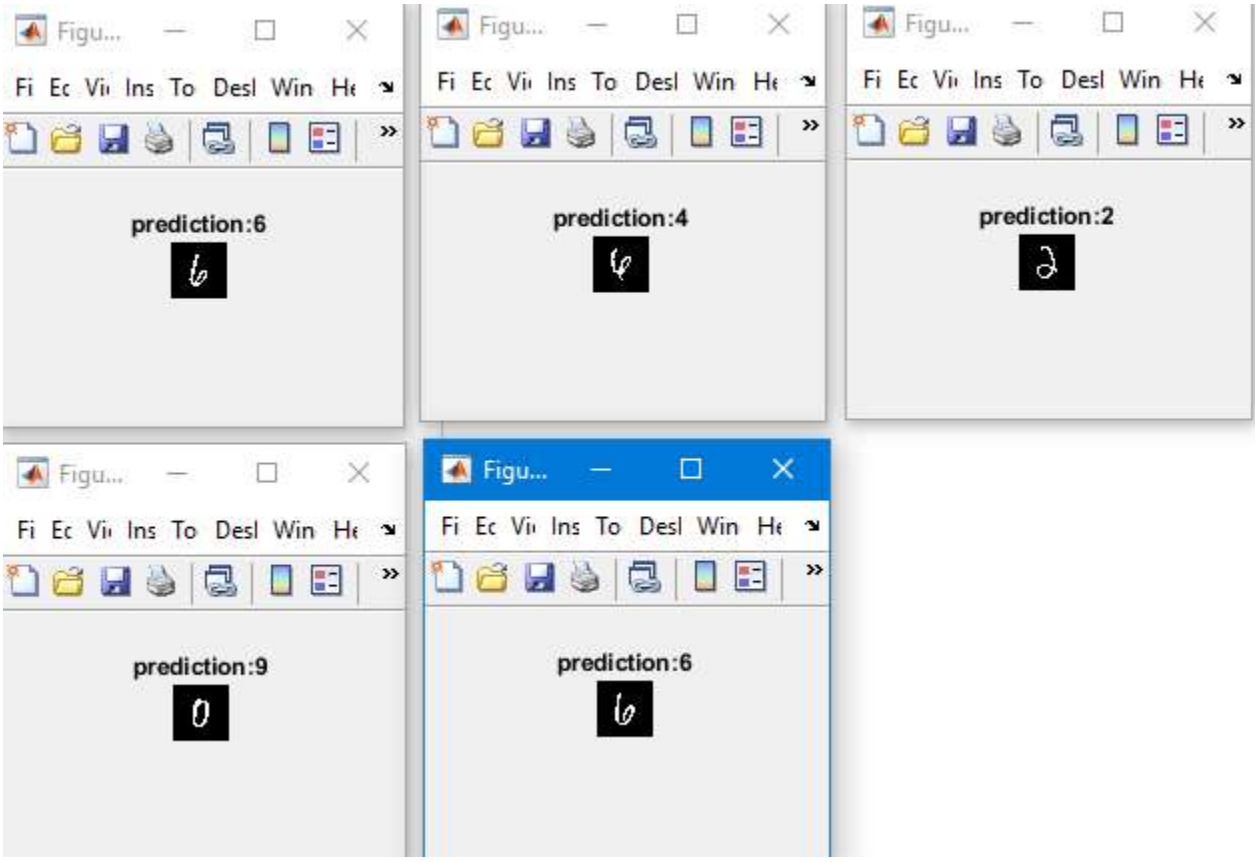
5.1



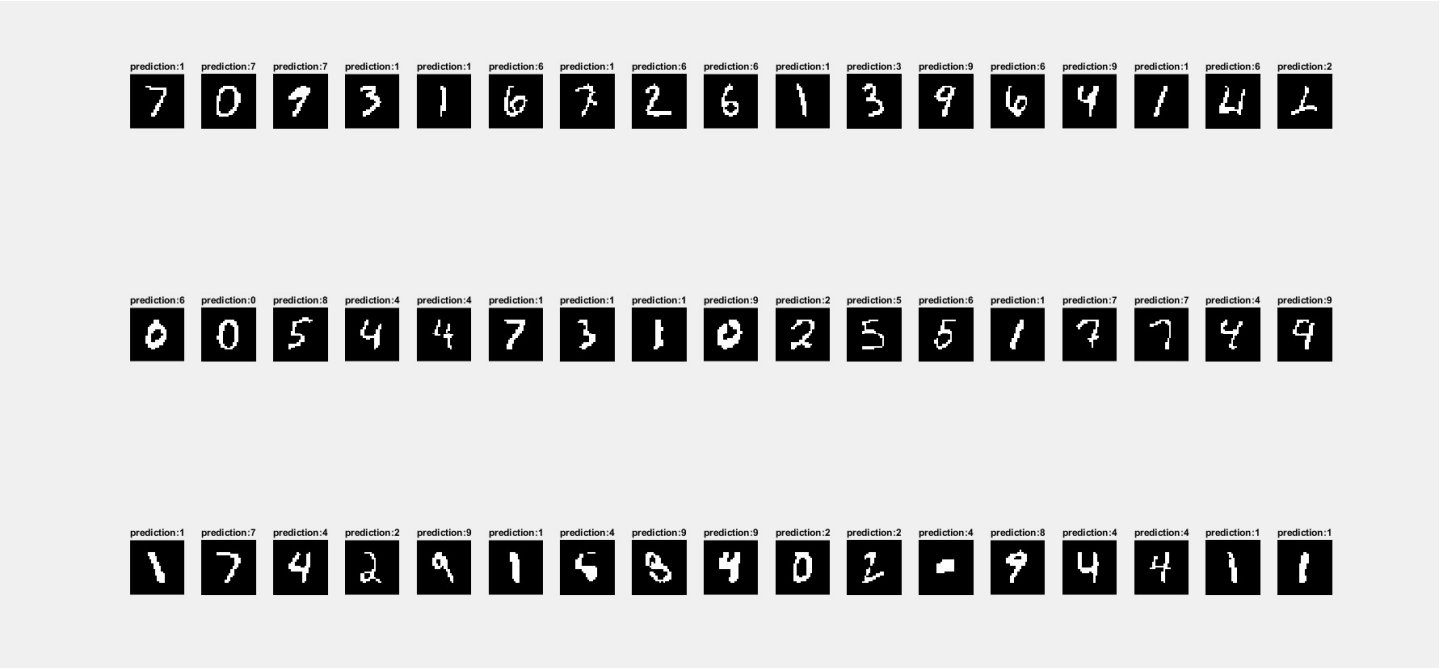
Prediction for Image 1 : Score 9/10



Prediction for Image 2: 7/10



Prediction for Image 3: 3/5



Prediction for Image 4: 30/50

I have commented codes that must be selected manually for the different iterations of the 4 images, different padding settings worked better for the 4th image. There are image errors in some cases that lead to miss identification of the numbers.