1. What does your graph show? How does Ein compare to Eout? Does the error ever get worse from one update to the next? Explain.

This graph shows the error after each iteration of the pocket perceptron. While both Ein and Eout fall quickly within the first hundred iterations, Eout never reaches Ein. Eout sometimes rises, because hypotheses are only pocketed if they are better than the previously pocketed hypothesis with regard to Ein. When a new hypothesis has a lower Ein, it doesn’t necessarily have a lower error in the wild, which is why Eout sometimes rises

1. Describe how you would build a system that, given an input vector, determines which digit the image represents. (This is distinguished from the system you built, which merely determines whether the digit is a 3 or not.)

The system would have ten different sets of weights, one for 0 through 9. It would run an image against each, then classify the image (into 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9, not 1 or -1) by which weights’ dot product returns the highest double.

1. What impact does the pocket algorithm have on the VC dimension? Explain.

Answer