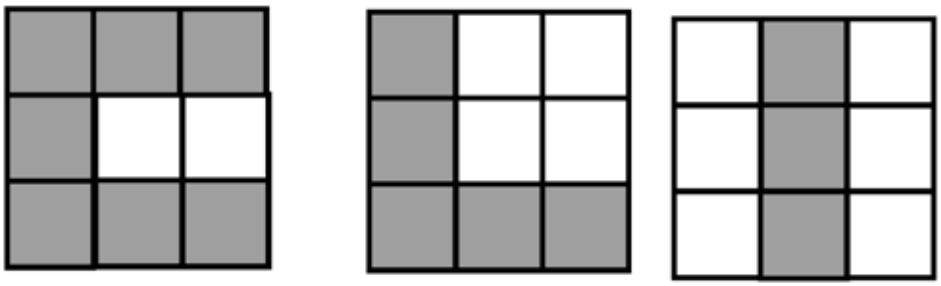
FIT5186 Intelligent Systems

Week 2 Tutorial 2

Character recognition using Perceptrons

Design and train the classifier of printed characters C, L and I shown below in bitmap form. Assign input vector entries 0 and 1 to represent white and black pixels respectively.
Use a single layer network of three discrete binary Perceptron with ten inputs, including the threshold.



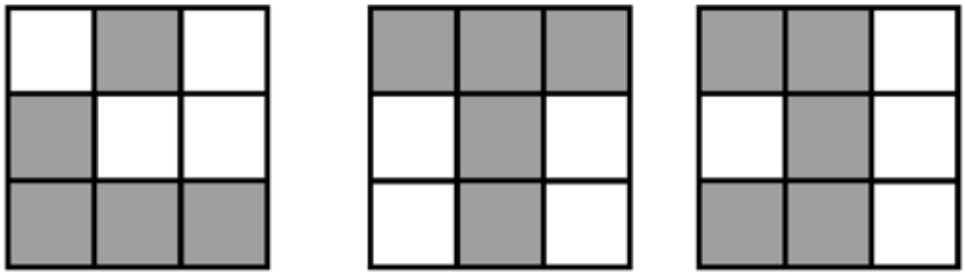
Initially the weights should all be zero. Implement the training by hand calculations through the first three epochs. This is just like the example in the lecture. Remember the weight adaptation rule is:

$$\mathbf{w}_i \leftarrow \mathbf{w}_i + c(d_i - o_i)\mathbf{x}$$

for each Perceptron *i*.

Once you think you understand how the weights are changed (through learning), use the program rclass classifier.exe downloadable from Moodle to completely train the network. This may not work on your PC if Visual Studio .Net is not installed.

Once the network has been trained, classify the following corrupted characters (You will need to do these classifications by hand calculations):



Make up your own corrupted characters and see how your trained network classifies them.