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Assignment 3

Neural Networks : Fall 1400 : Dr. Mozayani
Due Saturday, Azar 12, 1400

Contents

Problem 1

Consider the following inputs:
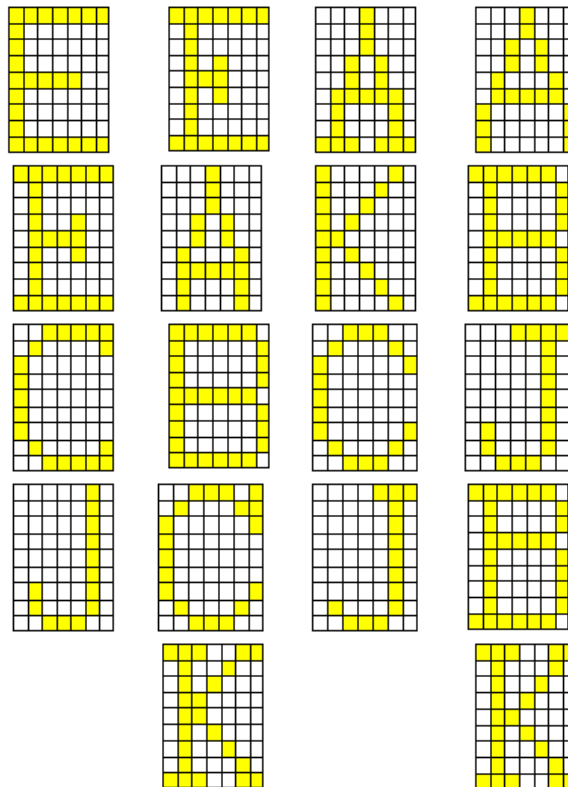$I_1 = [1 \ 0]^T$, $I_2 = [0 \ 1]^T$ and $I_3 = [1 \ 1]^T$.
Using the Kohonen learning algorithm, train a network for a single epoch ($\alpha = 0.2$).
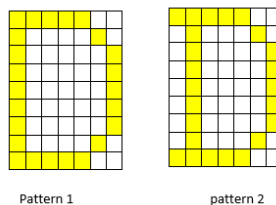
Problem 2

(a)

Train a Kohonen grid with the dimensions of 9 * 7 using the following patterns. Then, indicate how these patterns will be categorized after training.

(b)

How will the trained network predict the category of the following patterns?

Pattern 1   pattern 2

Problem 3

Explain the applications of an SOM network. Furthermore, state that why an SOM can be used in those areas.

Problem 4

Please refer to the attached NN_HW3_Hopfield notebook.

Notes

- Codes should be implemented in .ipynb format (notebooks)

- All Code cells should be executed before turning in the assignment (Make sure your outputs are there before you submit your assignment)

- Please explain the code and the results in the notebook

- We will not answer any further questions as comprehension of the questions is part of your overall score

- Please upload your assignments as a zipped folder with all necessary components