ASSIGNMENT 7

Due November 25, 2014 (before start of class)

Problem 1

In class we used a Bidirectional Associative Memory neural network with and then later without biases to store the association of uppercase letters "A" and "C", respectively with two two-dimensional targeted vectors. The two letters were discretized as black and white patterns on a 5 by 3 grid.

In this problem perform the same types of tasks as we did in class for the following case.

The associations defined here involve the three letters "C", "D" and "X":

```
.##
#..
#..
#..
.##
```

with $\mathbf{t}^{(1)} = [\ -1,\ 1,\ 1\ ]$,

```
##.
#.#
#.#
#.#
##.
```

with $\mathbf{t}^{(1)} = [\ 1,\ -1,\ 1\ ]$, and

```
#.#
#.#
.#.
#.#
#.#
```

with $\mathbf{t}^{(1)} = [\ 1,\ 1,\ -1\ ]$.

Try input patterns on the left and on the right with clean and noisy signals, with and without mistakes, using bipolar neurons. You need to show step by step results as we did by performing hand calculations in the lecture. Here some calculations will have to be more messy.

You also need to write a computer program and test it against the results you obtained from hand calculations. Produce a hard copy of all you results obtained both from hand calculations and from your program. Submit online an electronic copy of the program.

This assignment will count twice as much as a normal one.