Neural Networks LAB #4

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Task 1:

Multilayer Perceptron and Error back Propagation.

The task was to implement a MLP using error ((MSE) back propagation function. The following procedure was adopted.

Backprop Function:

Initlize:

a. Initialize parmeters, ni,no,npatterns,ete
b. Initialize the weights whi and who as (random in -1,+1).
c. Order of whi and whi should be (ni+1)x nh and (nh+1) x no.
d. Initlize sh and so as zeros(nh,1) and so(no,1).

Main loop:

a. For t=1:nepochs
b. Init mse=0
c. For l=1:npatterns

Feedforward step

a. Compute sh and so . using formulas specified in lecture notes.

Back propagation step

a. Compute delta_k and dwoh. using formulas specified in lecture notes.
b. Compute delta_i and dwhi. using formulas specified in lecture notes.
c. Update mse = mse+mean((so-T(L,:).^2)(mean of all outputs)
d. End

Apply weight update who = who + dwoh

Whi=whi+dwhi

Compute final mse = mse/npatterns

Display graph of mse vs epochs

End

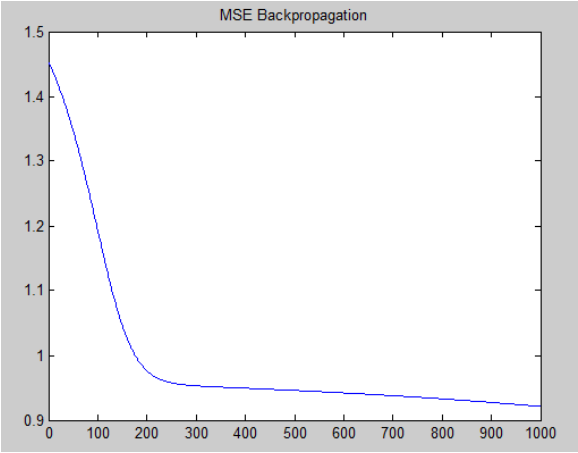
MLPtest

Init(receives who,who,x,t,np)

a. Assign parameters,no,npatterns
b. Initlize activations sh and so as zeros().
   main loop.
   a. For l=1:npatterns
   b. Feed forward step
   c. Compute sh and so
   d. Update mse as above.
   End
   Compute final mse = mse/npatterns.
   end

Results: using eta=0.001 and 1000 epochs

For toy dataset1(dataset3.1 of last assignment). nh=2



For semeion data:

nh = 10