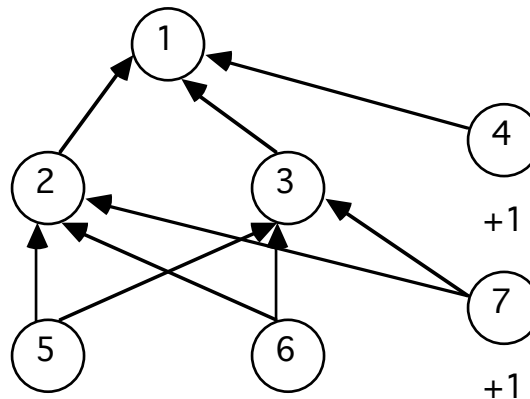


## CS 678 MLP Backpropagation review homework

A 2-2-1 backpropagation model has initial weights as shown. Work through a single cycle of learning for the following pattern. Assume 0 momentum and a learning rate of 1. Round calculations to 3 significant digits to the right of the last occurring 0. Give values for all nodes and links for activation, output, error signal, weight delta, and final weights. Show these different parameters in a readable format with equations. Assume the input nodes and bias nodes are simply place holders for the inputs which pass their values directly to the next layer.

Weights:  $w_{2,1}$  (read, weight from node 2 to 1) = .1    $w_{3,1} = -.8$     $w_{4,1} = -1.3$   
 $w_{5,2} = 1.0$     $w_{6,2} = .5$     $w_{7,2} = 0$     $w_{5,3} = 1.2$     $w_{6,3} = .5$     $w_{7,3} = .5$   
Training Pattern: .4   .9  $\rightarrow$  .1



For a review on this you can go to the BP slides (18-20), but make sure you are seeing the intuition and flow of the algorithm, and not just punching in the numbers to the equations. If you see the flow, it is easy to remember the equations.

After doing this go to link below: Neural Network Playground using the *tensorflow* tool and play around with the BP simulation. Try different training sets, layers, inputs, etc. and get a feel for what the nodes are doing. You do not have to hand anything in for this part.

<http://playground.tensorflow.org/>