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clear;
clc;
x = [-1 -1 1 1; % Input 1
     -1 1 -1 1]; % Input 2
t = [-1 -1 -1 1]; % Target output for AND function
w = [0 0];
b = 0;
alpha = input('Enter Learning Rate: ');
theta = input('Enter Threshold Value: ');
epoch = 0;
convergence = true;

while convergence
    convergence = false;
    for i = 1:4
        yin = b + x(1, i) * w(1) + x(2, i) * w(2);

        if yin > theta
            y = 1;
        elseif yin >= -theta && yin <= theta
            y = 0;
        else
            y = -1;
        end

        if y ~= t(i)
            convergence = true;
            for j = 1:2
                w(j) = w(j) + alpha * t(i) * x(j, i);
            end
            b = b + alpha * t(i);
        end
    end
    epoch = epoch + 1;
end

disp('Perceptron for AND Function');
disp('Final Weight Matrix:');
disp(w);
disp('Final Bias:');
disp(b);
disp('Number of Epochs:');

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disp(epoch);
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