

```

clc
clear
close all
figure
hold on
axis square
xlim([-10, 10]);
ylim([-10, 10]);

filename = 'Data.csv';
delimiter = ',';
startRow = 3;
formatSpec = '%f%f%f%f%f%f%f%[^\n\r]';

fileID = fopen(filename, 'r');

dataArray = textscan(fileID, formatSpec, 'Delimiter', delimiter, 'HeaderLines',
startRow-1, 'ReturnOnError', false);

fclose(fileID);

Sample = dataArray{:, 1};
x1 = dataArray{:, 2};
x2 = dataArray{:, 3};
x3 = dataArray{:, 4};
x4 = dataArray{:, 5};
x5 = dataArray{:, 6};
x6 = dataArray{:, 7};
x7 = dataArray{:, 8};
x8 = dataArray{:, 9};

clearvars filename delimiter startRow formatSpec fileID dataArray ans;

N = numel(Sample);
z = zeros(N, 1);
S = zeros(3, 1);

X = [[x1, x2, z + 1, z + 1, z - 1]', [x3, x4, z + 1, z - 1, z + 1]';
%X = [[x5, x6, z + 1, z + 1, z - 1]', [x3, x4, z + 1, z - 1, z + 1]];

w = zeros(3, 1);
Y = {};
c = 0.5;
roh = c;
t = 0;
while true
    for i = 1:numel(X(1, :))
        if X(5, i) * w' * X(1:3, i) >= 0
            Y = [Y; i];
        end
    end
    y = cell2mat(Y);
    for j = y(:)'
        S = S + X(5, j) * X(1:3, j);
    end
end

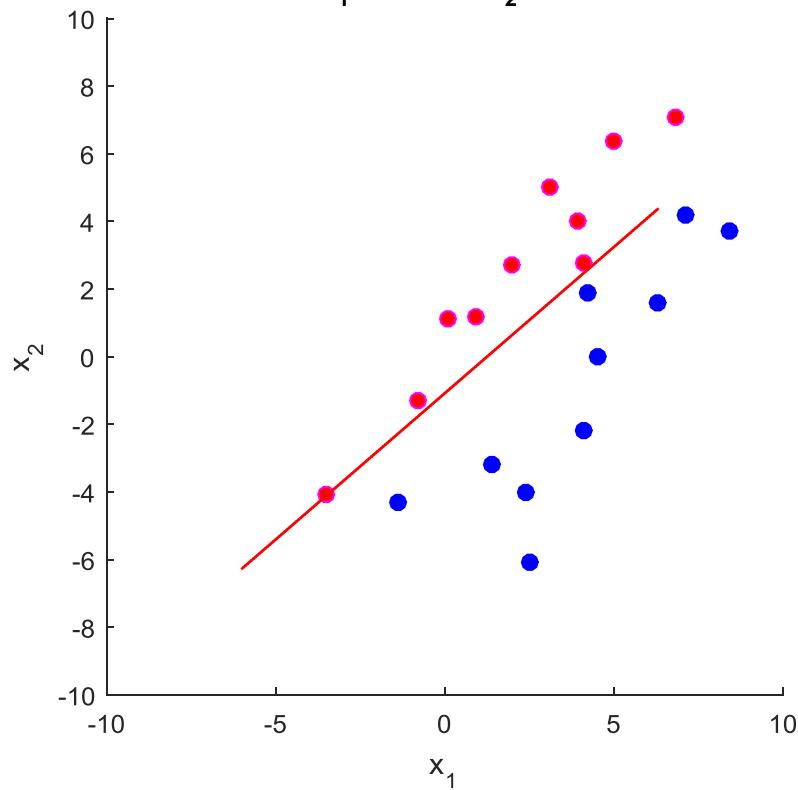
```

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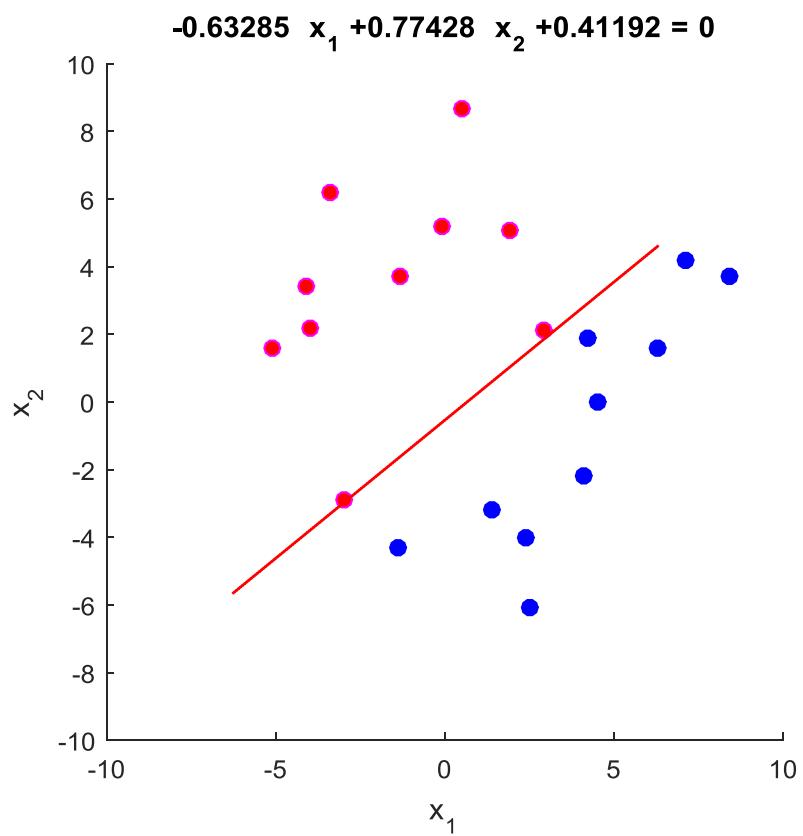
if w(1) || w(2) || w(3) ~= 0
    cla
    plot(X(1, 1:10), X(2, 1:10), 'om', 'MarkerFaceColor', 'r');
    plot(X(1, 11:20), X(2, 11:20), 'ob', 'MarkerFaceColor', 'b');
    plt = ezplot([num2str(w(1)), '* x1 +', num2str(w(2)), '* x2 +',
num2str(w(3))]);
    set=plt, 'Color', 'red', 'LineWidth', 1);
end
if isempty(Y)
    disp('Number of Iterations Required for Convergence');
    disp(t)
    break;
end
w = w - roh .* S;
w = w ./ norm(w(1:2));
t = t + 1;
Y = {};
S(:) = 0;
pause(0.25);
roh = c / t;
end

```

$$-0.65434 x_1 + 0.7562 x_2 + 0.81269 = 0$$



Number of Iterations Required for Convergence



Number of Iterations Required for Convergence

18