# 线性可分支持向量机Matlab实现

学习线性可分支持向量机算法,完成下面习题

给定三个数据点：, ,. 其中x1，x2为正例，x3为负例，求线性可分向量机（要求在图中画出支撑超平面）。

代码

clear all;

clc;

X = [3,3;4,3;1,1];

x\_1 = X(:,1);

x\_2 = X(:,2);

Y = [1,1,-1];

m = size(X);

for i = 1:m(1,1)

X(i,:) = X(i,:)\*Y(1,i);

end

H = X\*X';

f = [-1;-1;-1];

A = Y;

b = 0;

lb = zeros(3,1);

[x,fval,exitflag,output,lambda] = quadprog(H,f,[],[],A,b,lb);

n = size(x);

w = x' \* X;

for i = 1:n(1,1)

if x(i,1) > 0

b = Y(1,i)-w\*X(i,:)'\*Y(1,i);

break;

end

end

y\_1 = [0,4];

for i = 1:2

y\_2(1,i) = (-b-w(1,1)\*y\_1(1,i))./w(1,2);

end

hold on

plot(y\_1,y\_2);

for i = 1:3

if Y(1,i) == 1

plot(x\_1(i,:),x\_2(i,:),'+b');

elseif Y(1,i) == -1

plot(x\_1(i,:),x\_2(i,:),'ob');

end

end

axis([0,7,0,7])

hold off

