```
clear all; clc;
```

# fetching data

```
[xt, yt] = getData();
siz = size(xt);
numData = siz(1);
dimData = siz(2);

objective = @(x)x(1:dimData).'*x(1:dimData);
A=[];
b=[];
for i=1:numData
    A=[A;-yt(i)*xt(i,:) -yt(i)];
    b=[b;-1];
end
x0=get_start_point();
x0=x0(1:dimData+1);

x = fmincon(objective,x0,A,b);
x

fig = figure;
hold off;
msize=14;
for i = 1:numData
    if(yt(i)==1)
        plot(xt(i,1),xt(i,2),'xblack','MarkerSize',msize);
    else
        plot(xt(i,1),xt(i,2),'oblack','MarkerSize',msize);
    end
    hold on;
end

index=1;
```

```
Local minimum found that satisfies the constraints.

Optimization completed because the objective function is non-
decreasing in
feasible directions, to within the default value of the optimality
 tolerance,
and constraints are satisfied to within the default value of the
 constraint tolerance.



Local minimum found that satisfies the constraints.
```

```
Optimization completed because the objective function is non-
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feasible directions, to within the default value of the optimality
 tolerance,
and constraints are satisfied to within the default value of the
 constraint tolerance.
```
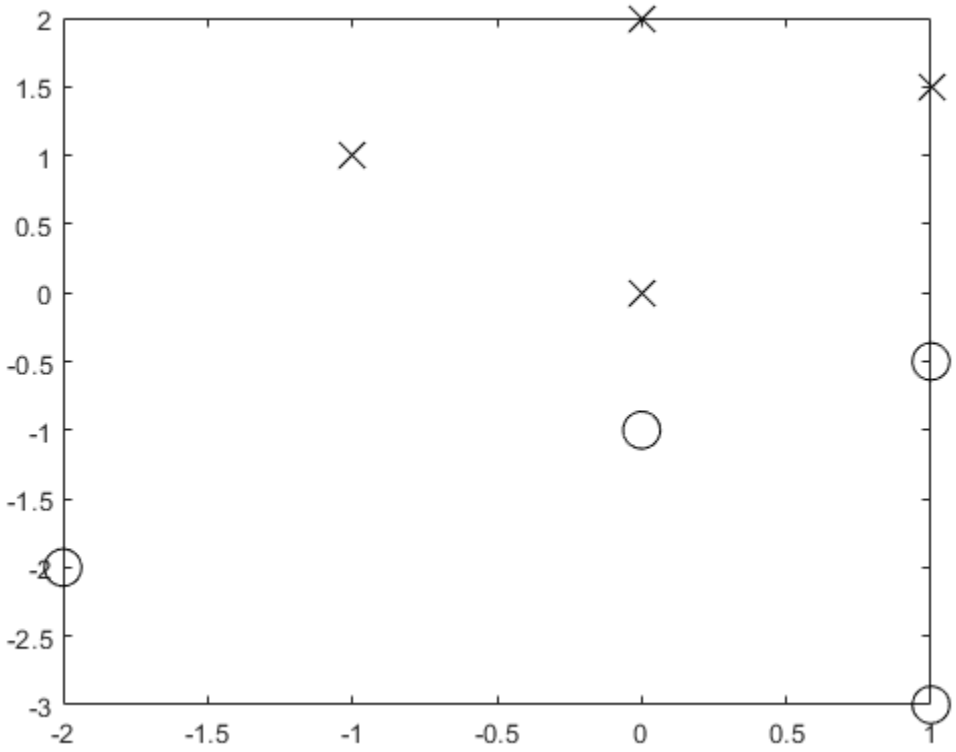
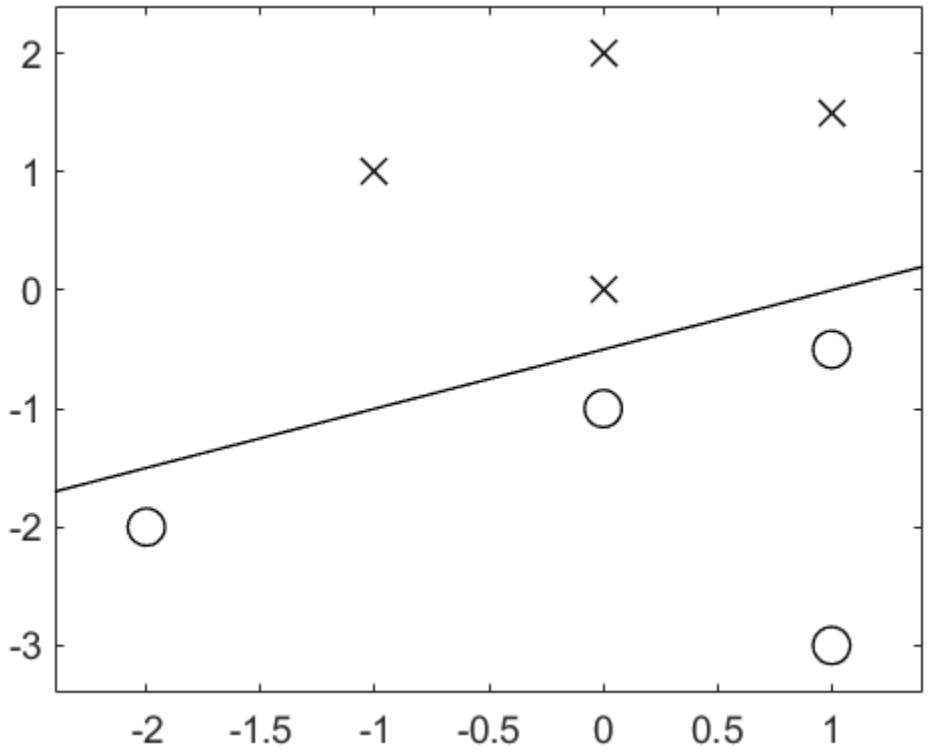

```
x =

   -1.0000
    2.0000
    1.0000
```




# plotting separating hyperplane

```
margin = 0.4;
xMin = min(xt(:,1))-margin;
xMax = max(xt(:,1))+margin;
yMin = -(xMin*x(1)+x(3))/x(2);
yMax = -(xMax*x(1)+x(3))/x(2);
if(index==1)
    marker = '-black';
```

```
elseif(index==2)
    marker = '--black';
else
    marker = '-black';
end
p(index)=plot([xMin, xMax],[yMin, yMax],marker);
index=index+1;
set(gca,'FontSize',14)
set(findall(gca, 'Type', 'Line'),'LineWidth',1);
xlim([xMin, xMax]);
ylim([min(xt(:,2))-margin, max(xt(:,2))+margin]);

print(fig, 'images/svm_linearly_separable_exact_method','-dpng');
```

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