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Perceptron learning rule

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Batch:Entc(2017-21) G-3

```
clc;
clear all;
close all;
```

Aim:

Implementation of AND gate using perceptron

Theory:

Perceptron comes under a signle layer feed forward networks Network consists of 3 units: 1) Sensory Unit (input) 2)Associate unit (hidden) 3)Response unit (output) The binary activation function is used in sensory and associator unit. Response unit has an activation of 1, 0 or -1.Binary step with threshold theta is used as activation.

The perceptron is a triggering circuit has we use step function to trigger the inputs. It is used in the weight updation of between the associate and response unit.

It's application include encode databases, points of entry, monitor access data, and routinely check the consistency of the database security.

Perceptron Learning Rule for AND gate

```
x=[1 1 -1 -1; 1 -1 -1 1];
t=[1 -1 -1 -1];
w=[0 0];
b=0;
alpha=1;
theta=0;
count=1;
epoch=1;
while count
    count=0;
     for i=1:4
         yin=b+x(1,i)*w(1)+x(2,i)*w(2);
```

```
      if yin>theta
          y=1;
      end
if yin<=theta & yin>=-theta
          y=0;
      end
if yin<-theta
          y=-1;
end
      if y-t(i)
          count=1;
     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 ANDfunction');
disp('final weight matrix');
disp(w);
disp('Final bias');
disp(b);
disp('the training is over');
```

```
Perceptron for ANDfunction
final weight matrix
     1     1

Final bias
    -1

the training is over
```

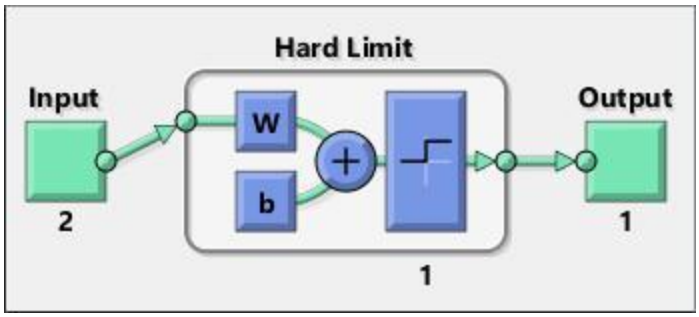
Deep learning tool box

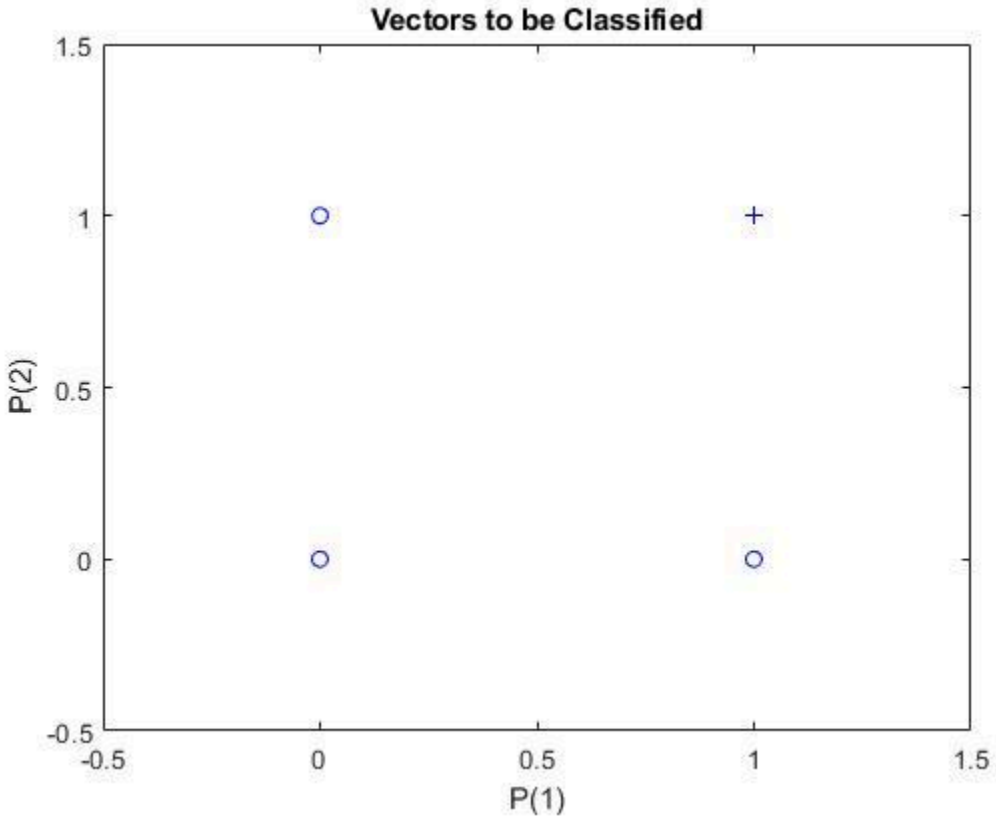
```
X = [[0;0], [0;1],[1;0],[1;1]];  % this defines 4 input training
 vectors
t = [0 0 0 1];    % this defines the corresponding output for each
 vector
net = perceptron;
net = train(net,X,t);
view(net)
y = net(X);
sim(net, [1; 1]) % test the network with the input [0;0]
figure(1)
figure(2)
plotpv(X, t)     % plot the network training data
figure(3)
plotpv(X, t)
plotpc(net.iw{1,1},net.b{1})
figure(4)
```

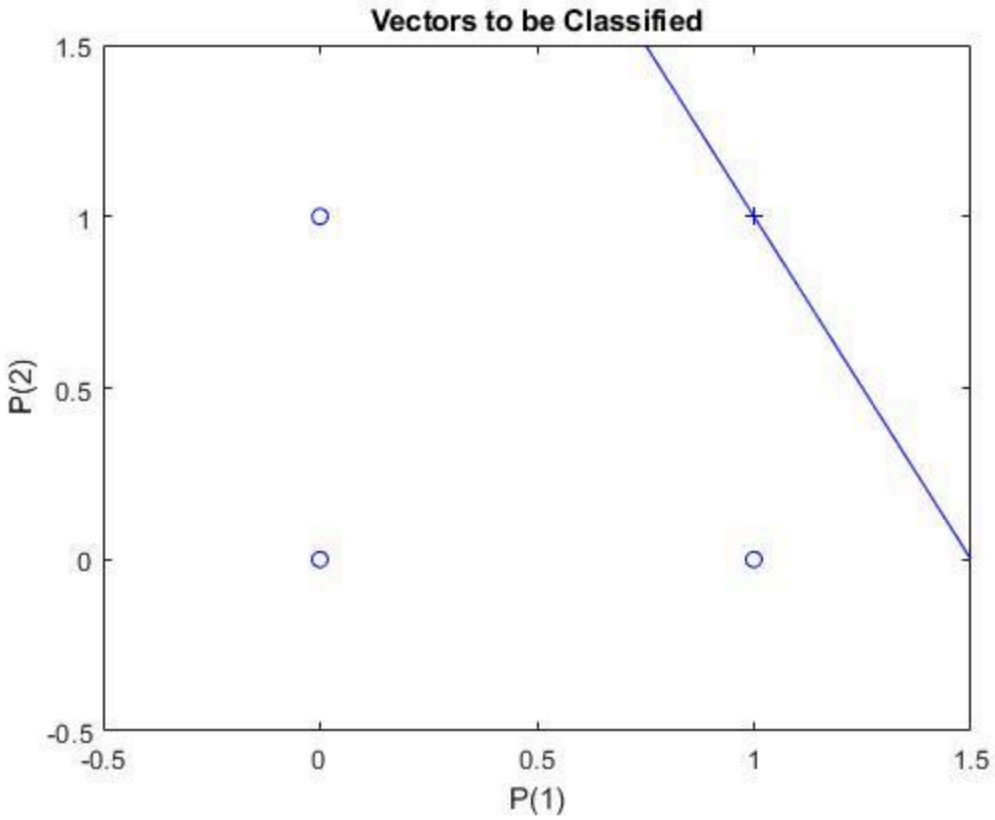
```
i=imread('C:\Users\acer\Documents\4th year\Final year Project
\capture.png');
imshow(i);
```

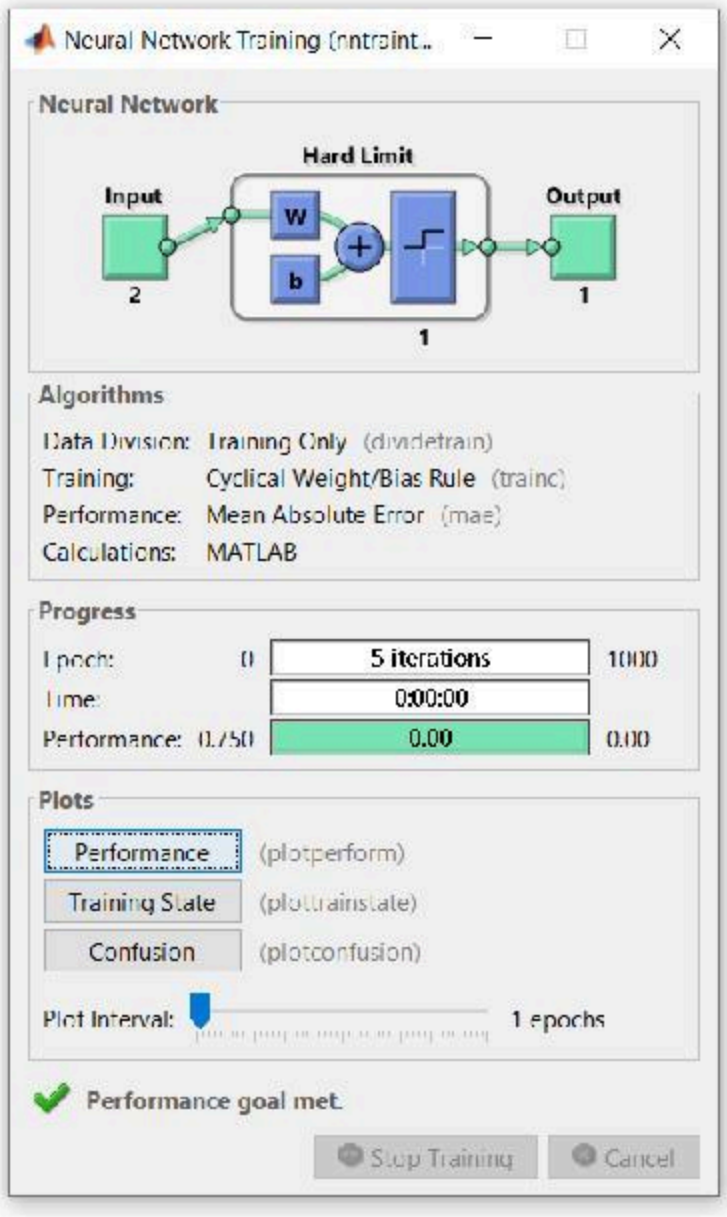
```
ans =

     1
```






Vectors to be Classified
1.5
1
0.5
0
-0.5
P(2)
-0.5
0
0.5
1
1.5
P(1)



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