ENGR 391: Computer Vision
Homework Assignment # 6
Spring 2024

Hough transform

The image in figure 1 can be reconstructed using

```
D=zeros(200,200)
D(50,:)=1
D(150,:)=1
D(:,50)=1
D(:,150)=1
```

Use the Hough transform to detect the lines in the image.

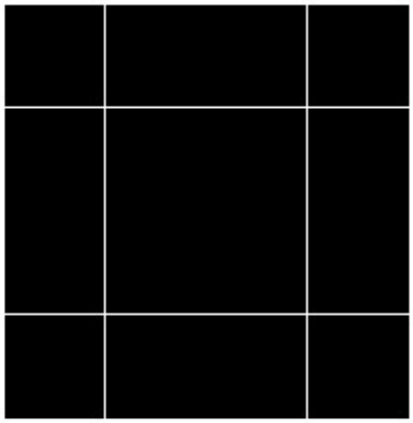

Figure 1. Image for Hough transform

Classification using ANN

We want to solve the classification problem shown in figure 2 using ANN. The data points their classes are below.

Class 1	Class 2
(5,2)	(1,2)
(6,3)	(1,3)
(5,4)	(2,2)
(6,4)	(2,3)

1. Write a program that uses the Perceptron learning rule to find the weights and the bias.

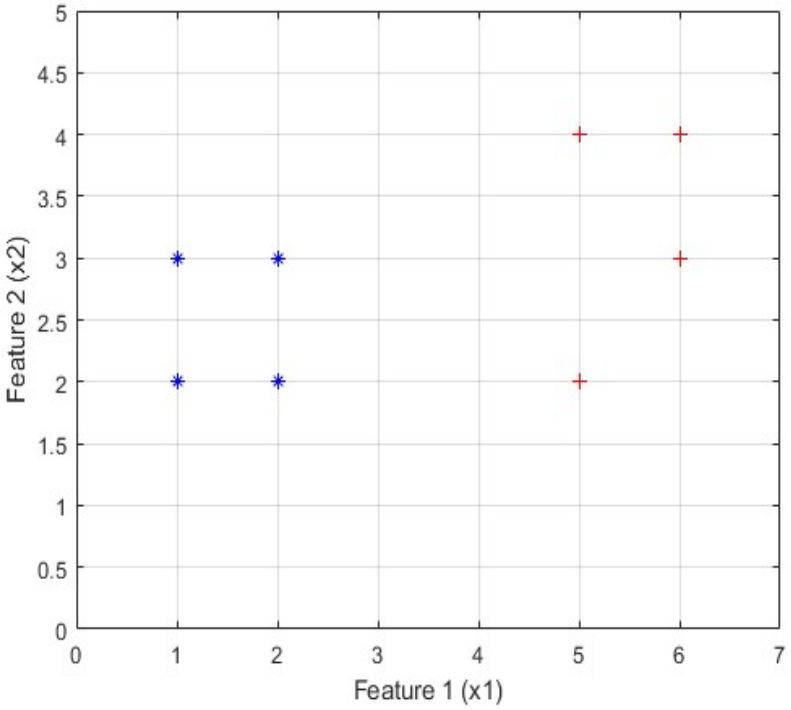

Figure 2. A classification problem

2. Draw the separation line with the data points on the same graph.

3. Assuming we have two new data points given by

$$P1 = (5, 3) \tag{1}$$

$$P2 = (1, 1) \tag{2}$$

To which class do these points below according to the network? Show your justification.