Chapter 3

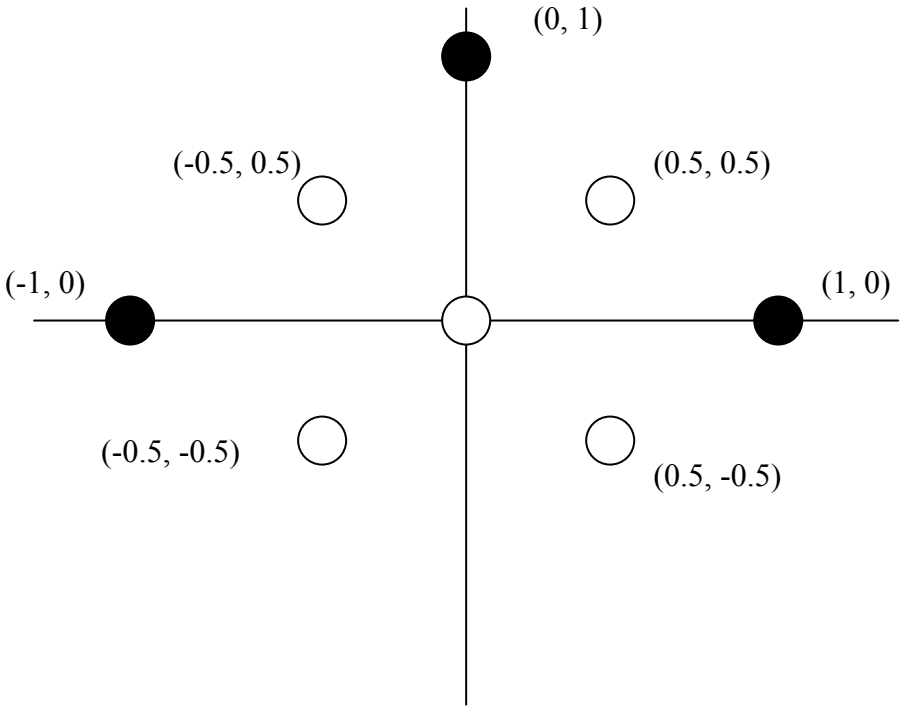
Learning with Quadratic Sigmoid Function

Exercises

3.1 Note that the MLP networks using the quadratic threshold activation function defined as

$$f(net,\theta)=\begin{cases}0 & if\ net^2>\theta\\ 1 & if\ net^2\le\theta\end{cases}$$

can implement dichotomy problems. The patterns as shown in Figure P1 have to be classified in two categories using a layered network. Figure P2 is the two-layer classifier using the quadratic threshold activation function. The values in the circles are the values of θ corresponding to the neurons. Figure P3 is the logic equivalent diagram. (1)~(5) Fill in the appropriate weights in the Figure P2. (6) Fill in the appropriate value of θ in the Figure P2. (7) Write down the correct interpretation of the logic gate in Figure P3. (8) Sketch the partitioning of the pattern space.



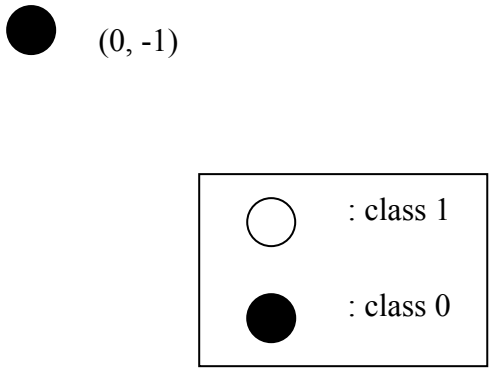


Figure P1.

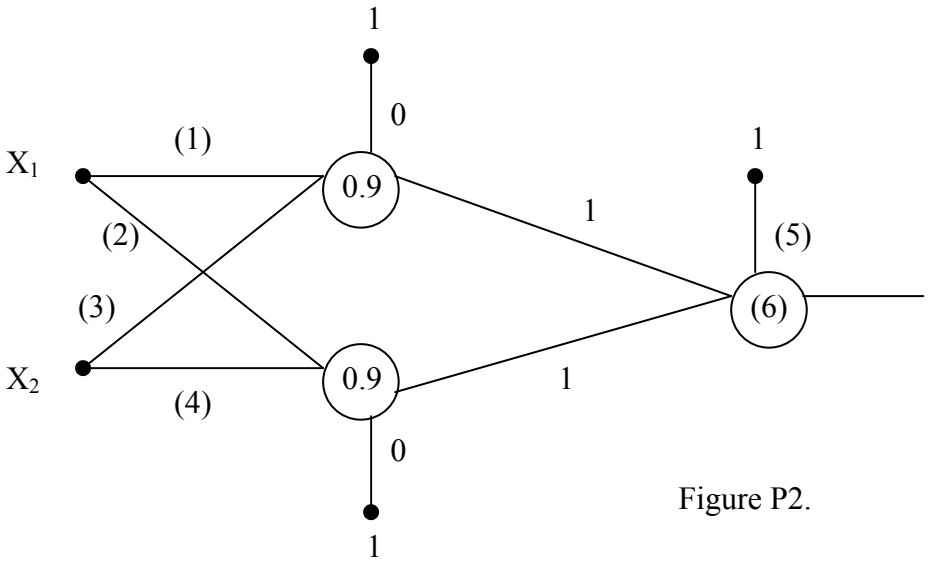


Figure P2.

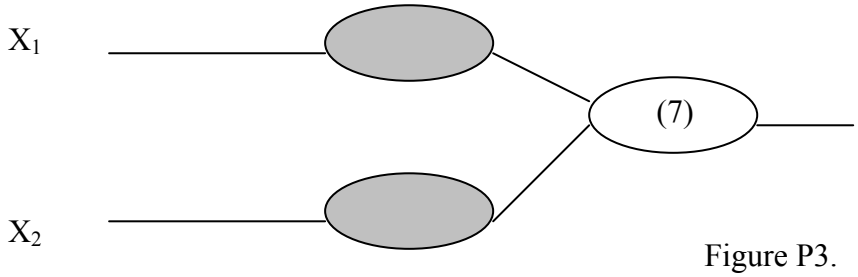
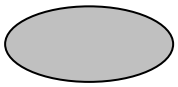


Figure P3.

The truth table of  ::

In	0	1	-1	0.5	-0.5
Out	1	0	0	1	1