CS 557: PATTERN RECOGNITION AND LEARNING
QUIZ 2
FALL 2016

PROBLEM
Given the following data:

x_1	x_2
1	3
2	1
3	2
0	0
1	2

If *N* is the total number of examples and dimensionality of *x* is *n* then the density of each point is given by (*c* is a constant):

$$P(\boldsymbol{x}) = \frac{1}{c}\sum_{i=1}^{n} \emptyset\left(\frac{\boldsymbol{x}-\boldsymbol{x}^i}{h}\right)$$

$$\emptyset(\boldsymbol{x}) = \emptyset(\boldsymbol{x_1})\emptyset(\boldsymbol{x_2}) \ldots \emptyset(\boldsymbol{x_n})$$

$$\emptyset(x) = \begin{cases} |10 - x^2| & if |x| \leq 1 \\ 0 & otherwise \end{cases}$$

Find the density at the point (2,3)

SOLUTION

P((2,3)) = 1/c{(10-1)(10)+(10-0)(0)+(10-1)(10-1)+0*0+(10-1)(10-1)
= 252/c

Comparing the two posterior probabilities above we see that our predicted class label is:
-1