Occam's razor

Total points 0/5

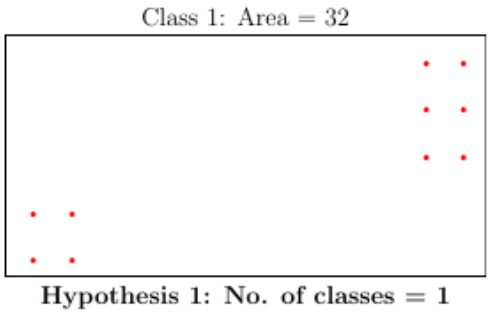
The respondent's email (**m22cs060@iitj.ac.in**) was recorded on submission of this form.

✗ Assume that there are 10 data points distributed over some 2D feature space, shown as red dots in each of the left and the right parts of the following figure. *0/5

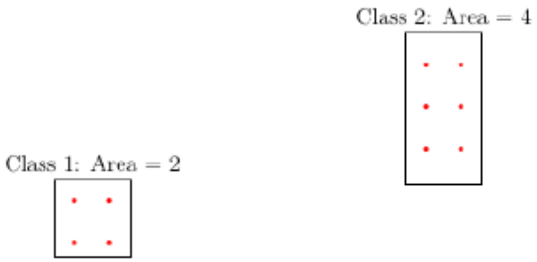
There are two hypotheses:
Hypotheses 1 (see left part of the diagram) proposes that all data points belong to the same class. The area of the tightest fit rectangle for all the points is 32 units.
Hypotheses 2 (see right part of the diagram) proposes that the data points are divided into two classes. The classes contain 4 and 6 data points respectively, and the area of the tightest fit rectangles for the classes are 2 and 4 units respectively.

Which of the hypotheses are more plausible?

Please show the details of your calculations.
1. Use log base 2 to simplify your calculations.
2. Assume k_1 = 1, k_2 = 0



Hypothesis 1: No. of classes = 1



Hypothesis 2: No. of classes = 2

In h1, no of data points is 10 and no of class is 1. In H2, no of data is 10 but there are two classes. K1=1,k2=0. Hypothesis 2 is plausible since for h1 hypothesis c(hi)=1*1 +10 log32 = 1+50 =51 . For h2, c(hi) =1*2=2. So, H2 is plausible.

Feedback

ANSWER SKETCH

For hypothesis 1:
Complexity of hypothesis (prior): c(h1) = 1
Complexity of evidence for h1: c(d | h1) = 10 x log 32 = 50
Therefore, posterior complexity for h1: c (h1 | d) = 51

For hypothesis 2:
Complexity of hypothesis (prior): c(h2) = 2
Complexity of evidence for h2: c(d | h2) = 4 x log 2 + 6 x log 4 = 16
Therefore, posterior complexity for h2: c(h2 | d) = 18

Posterior complexity of h1 is more than that of h2. Hence, h2 is more plausible.