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NPTEL (https://swayam.gov.in/explorer?ncCode=NPTEL) » Pattern Recognition And Application (course)

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Course outline

- **How does an NPTEL online course work? ()**
- **Week 0 ()**
- **Week 1 ()**
- **Week 2 ()**
  - Lecture 04 : Bayes Decision Theory - I

Week 2 : Assignment 2

The due date for submitting this assignment has passed.

Due on 2023-08-09, 23:59 IST.

As per our records you have not submitted this assignment.

1) ***2 points***

For a two class problem the decision surface is shown in figure 1, which of the following could be the best classifier design?

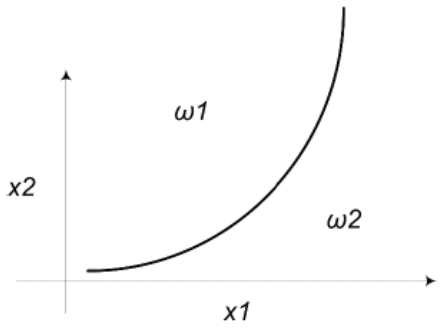

Figure 1

a) Linear classifier
b) Quadratic classifier
c) MLP classifier
d) Hyper-box classifier

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
b)

2) ***2 points***

For a two class problem the decision surface is shown in figure 2, which of the following could be the best classifier design?

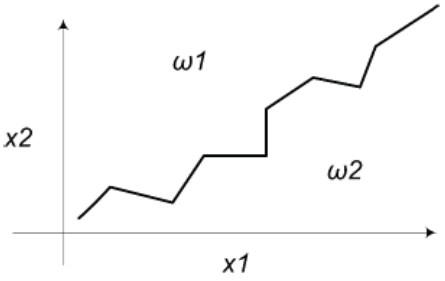

Figure 2

a) Linear classifier
b) Quadratic classifier
c) MLP classifier
d) Hyper-box classifier

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
c)

3) ***2 points***

For a two class problem the decision surface is shown in Figure 3, which of the following could be the best classifier design?

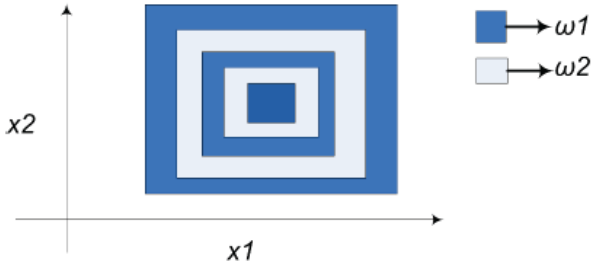

Figure 3

a) Linear classifier
b) Quadratic classifier
c) MLP classifier
d) Hyper-box classifier

- a)
- b)
- c)

d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
d)

4) **2 points**

Which of the following expression relates to Bayes Theorem?

a) $P\left(\omega_1/X\right) = P\left(X/\omega_1\right)P(\omega_1)$

b) $P\left(X/\omega_1\right) = P\left(\omega_1/X\right)P(\omega_1)$

c) $P\left(X/\omega_1\right) = \dfrac{P\left(\omega_1/X\right)P(\omega_1)}{P(X)}$

d) $P\left(\omega_1/X\right) = \dfrac{P\left(X/\omega_1\right)P(\omega_1)}{P(X)}$

a)
b)
c)
d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
d)

5) **2 points**

For a two class problem, which of the following is/are correct?

I. $P\left(\omega_1/X\right) > P\left(\omega_2/X\right)$, then $X \in \omega_1$

II. $P\left(\omega_1/X\right) > P\left(\omega_2/X\right)$, then $X \in \omega_2$

III. $P\left(\omega_1/X\right) = P\left(\omega_2/X\right)$, then X lies on decision surface

a) Only I
b) Only II and III
c) Only I and III
d) All I, II and III

a)
b)
c)

d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
c)

6) **2 points**

For a two class problem, the posterior probability distribution $P\left(\omega_i/X\right)$ is given in Figure 4, where $i = \{1,2\}$. For an unknown feature vector X_1 which of the following is correct?

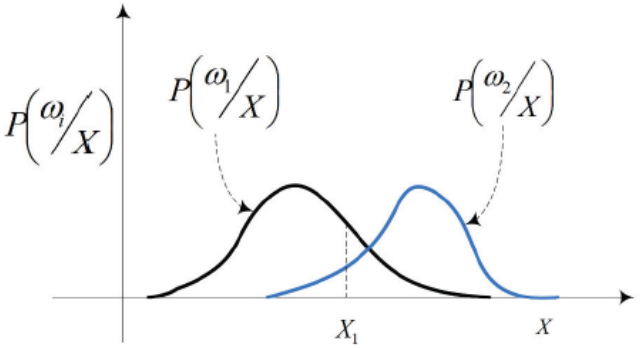

Figure 4

a) $X_1 \in \omega_1$
b) $X_1 \in \omega_2$
c) X_1 lies on decision surface
d) Cannot be classified

a)
b)
c)
d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
a)

7) **2 points**

For the following pattern, which of the following is the simplest classifier for classifying the following pattern?

a) Cubic classifier
b) Quadratic classifier
c) Linear classifier
d) None of these

a)
b)
c)

d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
c)

8) **2 points**

For a two class problem, if $R\left(\alpha_i/X\right)$ is the risk function $\lambda\left(\alpha_i/\omega_j\right)$ is the risk involved in classifying an unknown vector to class ω_i, whose actual class is ω_j. Which of the following is correct?

a) $R\left(\alpha_i/X\right)=\sum_{i=1}^{2}\left[\lambda\left(\alpha_i/\omega_j\right)P\left(\omega_i/X\right)\right]$

b) $R\left(\alpha_i/X\right)=\sum_{i=1}^{2}\left[\lambda\left(\alpha_i/\omega_j\right)P\left(\omega_j/X\right)\right]$

c) $R\left(\alpha_i/X\right)=\sum_{j=1}^{2}\left[\lambda\left(\alpha_i/\omega_j\right)P\left(\omega_j/X\right)\right]$

d) None of these

a)
b)
c)
d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
c)

9) **2 points**

For a two class problem, if $R\left(\alpha_i/X\right)$ is the risk function. Which of the following is correct?

a) $R\left(\alpha_1/X\right)>R\left(\alpha_2/X\right)$, then $X\in\omega_1$

b) $R\left(\alpha_1/X\right)>R\left(\alpha_2/X\right)$, then $X\in\omega_2$

c) $R\left(\alpha_1/X\right)=R\left(\alpha_2/X\right)$, then $X\in\omega_2$

d) None of the above

a)
b)
c)
d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
b)

10) **2 points**

In case of linearly separable classes,

a) a straight line separates the two classes in 2-D.
b) a parabola separates the two classes in 2-D.
c) a hyper-plane separates the two classes for dimensions greater than 3.
d) Both a and c.

- a)
- b)
- c)
- d)

No, the answer is incorrect.
Score: 0

Accepted Answers:
d)