



Deep Learning
Assignment- Week 1

TYPE OF QUESTION: MCQ/MSQ

Number of questions: 10

Total mark: 10 X 2= 20

QUESTION 1:

A single card is drawn from a standard deck of playing cards. What is the probability of that a queen is drawn from the deck of cards provided that the card is not a face card?

- a. 0
- b. 1
- c. 1/3
- d. 2/3

Correct Answer: a

Detailed Solution:

Since every queen is also a face card, $P(\text{queen}/\sim\text{face}) = 0$.

QUESTION 2:

For a two class problem Bayes minimum risk classifier follows which of following is true?

(The two different classes are ω_1 and ω_2 , and input feature vector is x , and consider $P(\omega_1) = P(\omega_2)$)

- a. Choose ω_2 if

$$\frac{\lambda_{21} - \lambda_{11}}{\lambda_{12} - \lambda_{22}} > \frac{P(\omega_2/x)}{P(\omega_1/x)}$$

- b. Choose ω_1 if

$$\frac{\lambda_{21} - \lambda_{11}}{\lambda_{12} - \lambda_{22}} > \frac{P(\omega_2/x)}{P(\omega_1/x)}$$

- c. Choose ω_1 if

$$\frac{\lambda_{21} - \lambda_{11}}{\lambda_{12} - \lambda_{22}} > \frac{P(\omega_1/x)}{P(\omega_2/x)}$$



d. Choose ω_2 if

$$\frac{\lambda_{21} - \lambda_{11}}{\lambda_{12} - \lambda_{22}} > \frac{P(\omega_1/x)}{P(\omega_2/x)}$$

Correct Answer: b

Detailed Solution:

Please refer to the video lecture.

QUESTION 3:

To measure the Smoothness, coarseness and regularity of a region we use which of the following descriptor?

- a. Color
- b. Signature
- c. Texture
- d. Fourier Descriptors.

Correct Answer: c

Detailed Solution:

One of the important approach to region description is texture content. This helps to provide the measure of some of the important properties of an image like smoothness, coarseness and regularity of the region.

QUESTION 4:

While computing polygonal descriptor of an arbitrary shape using splitting technique, which of the following we take as the starting guess?

- a. Vertex joining the two closet point above a threshold on the boundary.
- b. Vertex joining the two farthest point on the boundary.
- c. Vertex joining any two arbitrary point on the boundary.
- d. None of the above.

Correct Answer: b



Detailed Solution:

Options are self-explanatory.

QUESTION 5:

Consider two class Bayes' Minimum Risk Classifier. Probability of classes W_1 and W_2 are, $P(\omega_1) = 0.3$ and $P(\omega_2) = 0.7$ respectively. $P(x) = 0.45$, $P(x|\omega_1) = 0.65$, $P(x|\omega_2) = 0.5$ and the loss matrix

values are

$$\begin{bmatrix} \lambda_{11} & \lambda_{12} \\ \lambda_{21} & \lambda_{22} \end{bmatrix} = \begin{bmatrix} 0.1 & 0.9 \\ 0.85 & 0.15 \end{bmatrix}$$

Find the Risk $R(\alpha_2|x)$.

- a. 0.51
- b. 0.61
- c. 0.48
- d. 0.39

Correct Answer: c

Detailed Solution:

$$R(\alpha_2|x) = \lambda_{21} * P(\omega_1/x) + \lambda_{22} * P(\omega_2/x)$$

$$\text{Now, } P(\omega_1/x) = P(\omega_1) * P(x|\omega_1) / P(x) = 0.3 * 0.65 / 0.45 = 0.43$$

$$P(\omega_2/x) = P(\omega_2) * P(x|\omega_2) / P(x) = 0.7 * 0.50 / 0.45 = 0.77$$

$$\text{So, } R(\alpha_2|x) = 0.85 * 0.43 + 0.15 * 0.77 = 0.48$$



QUESTION 6:

The Fourier transformation of a complex sequence of number $s(k)$ for $k = 0, \dots, N - 1$ is given by:

- a. $a(u) = \sum_{k=0}^{N-1} s(k)e^{j2\pi uk/N}$
- b. $a(u) = \sum_{k=0}^N s(k)e^{j2\pi uk/N}$
- c. $a(u) = \sum_{k=0}^{N-1} s(k)e^{-j2\pi uk/N}$
- d. $a(u) = \sum_{k=-N/2}^{N/2} s(k)e^{-j2\pi uk/N}$

Correct Answer: c

Detailed Solution:

Options are self-explanatory.

QUESTION 7:

How do we compute the signature descriptor of an arbitrary shape?

- a. By plotting the distance of the boundary from centroid of the shape as a function of angle.
- b. By plotting the changes in boundary of the shape with respect to the mean of boundary.
- c. By plotting the arbitrary changes in boundary with median of the boundary.
- d. None of the above.

Correct Answer: a

Detailed Solution:

Options are self-explanatory.



QUESTION 8:

Which of the following is not a boundary descriptor.

- a. Polygonal Representation
- b. Fourier descriptor
- c. Signature
- d. Histogram.

Correct Answer:d

Detailed Solution:

Histogram is a region descriptor.

QUESTION 9:

When all values of gray co-occurrence matrix are arbitrary, then which one of the following will be true?

- a. Entropy will be high.
- b. Uniformity will be high.
- c. Element difference moment will be high.
- d. All of the above.

Correct Answer:a

Detailed Solution:

Options are self-explanatory.

QUESTION 10:

If the larger values of gray co-occurrence matrix are concentrated around the main diagonal, then which one of the following will be true?

- a. The value of element difference moment will be low.
- b. The value of inverse element difference moment will be low.
- c. The value of entropy will be very low.



d. None of the above.

Correct Answer: a

Detailed Solution:

Options are self-explanatory. We can't comment anything on the entropy based on the values of diagonal elements. Because it depends on the randomness of the value. Whereas element difference moment will be low and inverse element difference moment will be high.

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