



Nptel Online Certification Course
Indian Institute of Technology Kharagpur
Computer Vision
Assignment - Week 7

Number of questions: 10

Total marks: 10x2=20

QUESTION 1:

Type: MCQ

The average case time complexity of NN Search using K-D tree is

- a) $O(N)$
- b) $O(\log(N) + 2^d)$ where d is the dimension of the feature space.
- c) $O(N^2)$
- d) $O(\log_d(N))$ where d is the dimension of the feature space.

Correct Answer: b)

QUESTION 2:

Type: True or False

RANSAC suited for line fitting with outliers.

- a) True
- b) False

Correct Answer: True

QUESTION 3:

Type: True or False

RANSAC is best suited to find the 'optimal' line parameters when points belonging to a line are given.

a) True

b) False

Correct Answer: False

QUESTION 4:

Type: True or False

Hough transform best suited for line fitting in presence of many lines.

- a) True
- b) False

Correct Answer: a)

QUESTION 5:**Type: MCQ**

Consider the following two statements.

S1 : Least squares line fitting method does not work for all lines.

S2 : Least squares line fitting method is rotation-invariant.

- a) Both S1 and S2 are true
- b) S1 is true and S2 is false
- c) S1 is false and S2 is true
- d) Both S1 and S2 are false

Correct Answer: b)

Detailed Solution: Least squares line fitting method is not rotation-invariant.

Least squares line fitting method fails completely for vertical lines.

QUESTION 6:

Type: True or False

Low training error necessarily indicates overfitting.

- a) True
- b) False

Correct Answer: False

Detailed Solution: Low training error, but large test error indicates overfitting.

QUESTION 7:**Type: MCQ**

Find KL distance between A and B with probability distribution $(0.2, 0.5, 0.15, 0.1, 0.05)$ and $(0.3, 0.35, 0.05, 0.2, 0.1)$ respectively.

- a) 0.124
- b) -0.158
- c) -0.084
- d) None of the above

Correct Answer: d**Detailed Solution:** $D_{KL}(P\|Q) = \sum_x P(x) \ln\left(\frac{P(x)}{Q(x)}\right).$

QUESTION 8:**Type: MCQ**

Calculate cosine similarity between [3, 2, 6, 2, 5] and [4, 2, 8, 11, 4].

- a) 0.5842
- b) 0.4872
- c) 0.8074
- d) None of the above

Correct Answer: c

Detailed Solution: Cosine similarity between vectors a and b is $\frac{a \cdot b}{\|a\| \times \|b\|}$

QUESTION 9:**Type: MCQ**

Find the equation of the line that fit the following points using Least squares line fitting method. (8,3),(2,10),(11,3),(6,6),(5,8),(4,12),(12,1),(9,4),(6,9),(1,14)

a) $y = -1.1x + 14.0$

b) $y = -1.6x + 14.0$

c) $y = -1.1x + 4.2$

d) $y = 4.1x + 11.0$

Correct Answer: a)

QUESTION 10:

Type: True or False

$$D_{KL}(P||Q) \neq D_{KL}(Q||P)$$

- a) True
- b) False

Correct Answer: True
