

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION-2022

B.Tech-VII Semester (CS/IT/ECE/Civil/BT)

COURSE CODE (CREDITS): 18B1WCI742 (2)

MAX. MARKS: 35

COURSE NAME: Artificial Intelligence

COURSE INSTRUCTORS: Dr. Aman Sharma

MAX. TIME: 2 Hours

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Define the process of creating a Decision Tree with the help of a suitable example. How can a Decision Tree algorithm help to solve continuous variable problem? How can we create high variance and low bias decision trees and also explain vice versa scenario. [CO-4, CO-5, 5 Marks]

Q2. Classify these data points using Xgboost algorithm. Write all the steps involved in classifying. [CO-4, CO-5, 5 Marks]

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Q3. You are a research student researching the performance of companies with relation replacement of the CEO. As part of data analysis, you observed that 60% of the companies that increased their revenue by more than 5% in the last three years had replaced their CEO during the same period. Also, 35% of the companies that did not increase their revenue by more than 5% in the same period had replaced their CEOs. The probability that the revenue of a company will grow by more than 5% is 4%. Find the probability that the revenue of a company that replaces its CEO will increase by more than 5%. [CO-2, 5 Marks]

Q4. Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1 : 2 : 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C. [Marks: 3, CO-3]

Q5. Differentiate between types of ensemble learning methods also mention their advantages and

disadvantages along with examples? [CO-4, CO-5, 3 Marks]

Q6. Use Naive Bayes algorithm to train following text statements: [CO-4, 5 Marks]

Simply loved it	Positive
Most disgusting food, I ever had	Negative
Stay away, very disgusting food	Negative
Menu is absolutely perfect, loved it	Positive
A really good value for money	Positive
This is a very good restaurant	Positive
Terrible experience	Negative
This place has best food	Positive
This place has most pathetic serving food	Negative

Use the trained model to tag following text 'Very good food and service'.

Q7. a) Represent the following knowledge in a semantic network: [Marks: 6, CO-3]

Dogs are Mammals	Birds have Wings
Mammals are Animals	Bats have Wings
Birds are Animals	Bats are Mammals
Fish are Animals	Dogs chase Cats
Worms are Animals	Cats eat Fish
Cats are Mammals	Birds eat Worms
Cats have Fur	Fish eat Worms
Dogs have Fur	

b) Suppose you learn that Tom is a cat. What additional knowledge about Tom can be derived from your representation? Explain how.

c) Suppose Tom is unlike most cats and doesn't eat fish. How could one deal with this in the semantic network?

Q8. What are support vectors in SVM? Write down the mathematical equations of hard margin SVM hyper planes and its loss function. Also, draw graphical intuition of SVM to explain its functioning. [CO-4, CO-5, 3 Marks]

*****Best of Luck*****