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Question Paper Code : 80428

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Seventh Semester

Computer Science and Engineering

CS 8082 — MACHINE LEARNING TECHNIQUES

(Common to : Computer and Communication Engineering/Electronics and
Communication Engineering/Information Technology)

(Regulations 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the inductive learning hypothesis.
2. What is Heuristic space search?
3. Describe about Genetic Algorithm.
4. List the features of Back propagation algorithm.
5. Illustrate the mistake bound model of learning.
6. What is EM Algorithm?
7. Give the advantages of instance - based methods.
8. Summarize the three lazy learning methods.
9. What is e-learning?
10. Compare Inductive and analytical learning problems.

PART B — (5 × 13 = 65 marks)

11. (a) (i) Explain in detail the FIND-S : FINDING A MAXIMALLY SPECIFIC HYPOTHESIS. (7)
 (ii) Conclude the key properties of FIND-S algorithm. (6)

Or

- (b) Consider the following training dataset given below which consist of 6 instances. Apply Hypothesis Search space to generate the set of Consistent hypothesis.

S.N	Horns	Tail	Tusk	Paws	Fur	Colour	Hooves	Size	Elephant
1	No	Short	Yes	No	No	Black	No	Big	Yes
2	No	Short	No	No	No	Brown	No	Medium	Yes
3	Yes	Short	No	No	No	Brown	Yes	Medium	No
4	No	Short	Yes	No	No	Black	No	Medium	Yes
5	No	Long	Yes	Yes	Yes	White	No	Medium	No
6	No	Short	Yes	Yes	Yes	Black	No	Big	Yes

12. (a) What is a perception? Explain multilayer perception in a detail.

Or

- (b) (i) Compose for which problem is ANN learning is well suited and write down the characteristics. (6)
 (ii) Explain the features of genetic programming. (7)
13. (a) (i) Analyze the naïve Bayes classifier. (6)
 (ii) Explain naïve Bayes classifier with example. (7)

Or

- (b) Explain maximum likelihood algorithm.
14. (a) Explain the inductive bias of k-Nearest neighbor algorithm with example.

Or

- (b) Discuss radial basis function in detail. (13)
15. (a) Explain Reinforcement learning with an example in detail. (13)

Or

- (b) Summarize the merits and demerits of FOCL Algorithm.

PART C — (1 × 15 = 15 marks)

16. (a) Nowadays, data stored in medical databases are growing in an increasingly rapid way. Analysing the data is crucial for medical decision making and management. There is a huge requirement for the support of specific knowledge based problem solving activities through the analysis of patient raw data collection during diagnosis. There is an increasing demand for discovery of new knowledge to be extracted by the analysis of representative collections of example cases, describe by symbolic or numeric descriptors Explain how Machine Learning can deal with the problem of finding interesting regularities and pattern in data for above scenario. Choose an appropriate model and explain for the application.

Or

- (b) (i) Does the patient have cancer, or does he not? A patient takes a lab test and the result comes back positive. The test returns a correct positive result in only 98% of the cases in which the disease is actually present, and a correct negative result in only 97% of the cases in which the disease is not present. Furthermore, 0.008 of the entire population have this cancer. (7)
- (ii) Explain - K-Nearest Neighbor Algorithm with an example. (8)
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