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15EC834

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022 Machine Learning

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain various steps involved in designing a learning system. (08 Marks)
- b. List issues in Machine learning. (05 Marks)
- c. Describe the following problem with respect to task, performance and experience Hand written recognition problem. (03 Marks)

OR

- 2 a. Write Find – S algorithm. Apply the algorithm for the following training example.

Form	Color	Size	Class
Circle	red	small	+
Circle	red	big	+
Triangle	yellow	small	-
Circle	yellow	small	-
Triangle	red	Big	-
Circle	yellow	big	-

- b. Describe candidate elimination algorithm. (08 Marks)

Module-2

- 3 a. Describe the ID3 algorithm with the help of an example. (08 Marks)
- b. Discuss the two approaches to prevent over fitting of the data. (08 Marks)

OR

- 4 a. Discuss two popular weight update rules in Artificial neural networks.
 - i) Perceptron rule (08 Marks)
 - ii) Delta rule. (08 Marks)
- b. How a single perceptron can be used to represent the Boolean functions such as AND and OR. (08 Marks)

Module-3

- 5 a. Briefly describe the Baye’s theorem. (04 Marks)
- b. Explain hMAP Learning algorithm (maximum a posterior hypothesis) (04 Marks)
- c. A patient takes a lab test and the result comes 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. What is the maximum a posteriori hypothesis for a patient who tests positive? (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain briefly Naïve Bayes classifier and Gibbs algorithm/classifier. (08 Marks)
 b. The following table gives data set about stolen vehicles. Using bayes classifier classify the new data (Red, SUV, domestic)

Example No	Color	Type	Origin	Stolen
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	Sports	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

(08 Marks)

Module-4

- 7 a. Explain K-nearest neighbor algorithm. (05 Marks)
 b. Explain locally weighted Regression. (05 Marks)
 c. Explain case based Reasoning with an example. (06 Marks)

OR

- 8 a. Explain briefly radial basis functions. (04 Marks)
 b. What is Instant based learning? (04 Marks)
 c. Explain FOIL algorithm. (08 Marks)

Module-5

- 9 a. What is reinforcement learning and list the reinforcement problem characteristics. (08 Marks)
 b. Explain FOCL algorithm with an example. (08 Marks)

OR

- 10 a. Write differences between inductive and Analytical learning. (08 Marks)
 b. Explain Q-learning assuming deterministic reward and action with example. (08 Marks)

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