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Fourth Semester M.Tech. Degree Examination, June/July2018 Machine Learning Techniques

Time: 3 hrs.

Max. Marks: 80

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

Module-1

a. What is machine learning? Explain steps to design a learning system in details with example and diagram. (08 Marks)

b. Describe the find -S algorithm. explain its working by taking the enjoy sport concept and

training instances given below:

Sand .								
T	Example	Sky	Air Temp	Humidity	Wind	Water	Forecast	Enjoy sport
7	1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
f	2	Sunny	Warm	High	Strong	Warm	Same	Yes
1	3	Rainy	Cold	High	Strong	Warm	Change	No
r	4	Sunny	Warm	High	Strong	Cool	Change	Yes

(08 Marks)

OR

2 a. Describe candidate-elimination learning algorithm with example.

(08 Marks)

b. Illustrate the operation of ID3 for the following training examples given in the table I. Here the target attribute is PlayTennis. Draw the complete decision tree.

Day	Outlook	Temperature	Humidity	Wind	Play Tennis	
D1	Sunny	Hot	High	Weak	No	
D_2	Sunny	Hot	High	Strong	No	
D_3	Overcast	Hot	High	Weak	Yes	
D_4	Rain	Mild	High	Weak	Yes	
D_5	Rain	Cool	Normal	Weak	Yes	
D_6	Rain	/Cool	Normal	Strong	No	
D_7	Overcast	Cool	Normal	Strong	Yes	
D_8	Sunny	Mild	High	Weak	No	
D_9	Sunny	Cool	Normal	Weak	Yes	
D ₁₀	Rain	Mild	Normal	Strong	Yes	
D_{11}	Sunny	Mild	Normal	Strong	Yes	
D ₁₂	Overcast	Mild	High	Strong	Yes	
D ₁₃	Overcast	Hot	Normal	Weak	Yes	
D ₁₄	Rain	Mild	High	Strong	No	

(08 Marks)

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Module-2

Explain in detail perceptron based ANN system its representation and training rule. 3 (08 Marks) (08 Marks) Explain Back propagation algorithm in detail. OR (08 Marks) Describe in detail a prototypical genetic algorithm. Explain genetic programming with example. (08 Marks) Module-3 What is the relationship between Bayes theorem and problem of concept learning? Explain 5 (08 Marks) in detail. Explain likelihood hypothesis for predicting probabilities. (08 Marks) Explain Naïve Bayes classifier by applying it to a concept-learning problem. Use table I and novel instance <Outlook = sunny, Temp = cool, Humidity = high, Wind = strong > (08 Marks) (08 Marks) Explain the EM algorithm in detail. Module-4 Explain k-nearest neighbor learning algorithm with example. (08 Marks) Describe the method of learning using locally weighted linear regression. (08 Marks) OR Explain learning sets of First-order rules in detail with example. (08 Marks) 8 Explain how inverting resolution constructs hypotheses by inverting a deductive inference (08 Marks) rule. Module-5 (08 Marks) Compare inductive learning and analytical learning. Explain the explanation-based learning algorithm PROLOG-EBG. (08 Marks)

OR

a. Explain the Q functions and Q learning algorithm.
 b. Explain Q learning for non deterministic Markov Decision Process (MDP).

(08 Marks)
(08 Marks)

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