Question Paper

Exam Date & Time: 25-Jun-2022 (02:00 PM - 05:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal School of Information Sciences, Manipal
Second Semester Master of Engineering - ME (Cloud Computing / Big Data Analytics / Big Data and Data Analytics) Degree Examination - June 2022

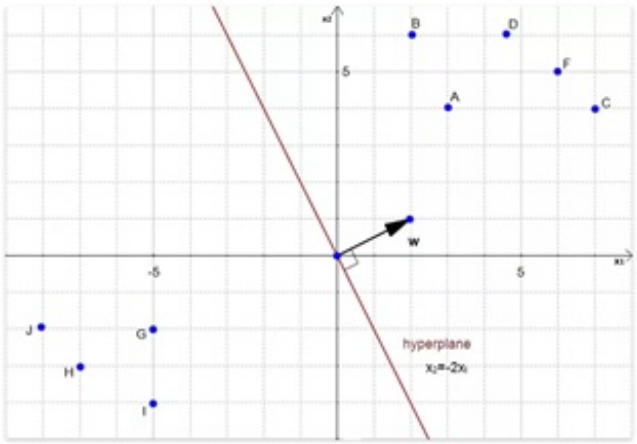
Machine Learning for Big Data [BDA 5201]

Marks: 100 **Duration: 180 mins.**

Saturday, June 25, 2022

Answer all the questions.

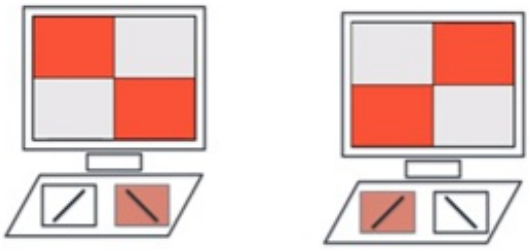
1)		Sketch the computational model of the artificial neural networks and briefly describe its operations (TLO 1.1 CO1 L3 5 Marks)	(5)
	a.)		
	b.)	Illustrate the use of weights and bias in artificial neural network (TLO 1.1 CO1 L3 5 Marks)	(5)
2)		Write the functions of a single-layer perceptron network architecture with a suitable diagram. Write the learning algorithm used for this purpose. (TLO 1.1 CO1 L3 5+5 Marks)	(10)
3)		Illustrate any two methods of measuring the dissimilarity or distance between two clusters with brief description. (TLO 1.2 CO1 L3 6 Marks)	(6)
	a.)		
	b.)	Write the taxonomy of clustering techniques. Briefly describe each type. (TLO 1.2 CO1 L3 4 Marks)	(4)
4)		What is Cluster Analysis? Illustrate its application in the context of any two different business domain. (TLO 1.2 CO1 L3 2+8 Marks)	(10)
5)		Write the purpose of kernel in SVM? Illustrate any two common kernels used with SVMs and explain their uses. (TLO 2.1 CO2 L3 10 Marks)	(10)
6)		Compute the following with reference to the figure given below:	(10)



Distance from a point A to the hyperplane (7 Marks)
Margin of the hyperplane (3 Marks)
(TLO 2.2 CO2 L3 10 Marks)

7)		Assume that you have a computer with 2 x 2 pixel resolution and a keyboard with only two	(10)

alphabets / and . Model a convolutional neural network to display the pixels as shown in the figure, when you press two alphabets / and .



(TLO 3.1CO3L410 Marks)

8)		Breakdown the functions of a Convolutional Neural Network with a suitable architecture model. Calculate the size of the output image, if the input image is 7 x 7 pixel size, and a filter of 3 x 3 pixel is applied with stride 1 and padded with one pixel border. (TLO 3.1 L4 10 Marks)	(10)
9)		Outline the reinforcement learning process with suitable example. (5 Marks) (TLO 3.2 CO3 L4 5 Marks)	(5)
	a.)		
	b.)	Relate the Markov decision process in reinforcement learning. (TLO 3.2 CO3 L4 5 Marks)	(5)
10)		Illustrate the roles of exploitation and exploration in reward maximization with a suitable example. (TLO 3.2 CO3 L4 6 Marks)	(6)
	a.)		
	b.)	Compare reinforcement learning with supervised machine learning process (TLO 3.2 CO3 L4 4 Marks)	(4)

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